

A Comparative Study between the School-Level Curriculum of Nepal and Other Countries

A Research Report

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कार्यकारी सारांश

पाठ्यक्रम भनेको जसले शैक्षिक दक्षता, सिकाइ सामग्री/विषयवस्तु, शिक्षण रणनीति/सिकाइ सहजीकरण, र मूल्याङ्कन योजनाहरूको रूपरेखा प्रस्तुत गर्न आवश्यक दस्तावेज हो। “पाठ्यक्रम” शब्दका दुई अर्थ छन् – एउटा साँघुरो र अर्को फराकिलो। साँघुरो अर्थमा यसले विभिन्न विषयहरूको योजनाबद्ध सामग्रीलाई जनाउँछ भने फराकिलो अर्थमा विद्यार्थीहरूको व्यक्तिगत विकासको अवसरका लागि विद्यालयद्वारा प्रदान गरिने विभिन्न अनुभवहरूलाई जनाउँछ। यसमा लक्ष्य/दक्षता, विषयवस्तु, सहजीकरण प्रक्रिया र मूल्याङ्कन विधिहरूका साथै पाठ र सन्दर्भका लागि निर्धारित सिकाइ सामग्रीहरू समावेश हुन्छन्। पाठ्यक्रम विकासले शिक्षा प्रणालीमा महत्वपूर्ण भूमिका खेल्छ, विद्यार्थीहरूको सिकाइ अनुभवहरूलाई प्रभाव पार्छ र भविष्यका चुनौतीहरूका लागि उनीहरूलाई सुसज्जित बनाउँछ (ब्रे एट अल., २०१४)। शिक्षा प्रणालीको प्रभावकारिता पाठ्यक्रमको प्रासङ्गिकता, समावेशिता र अनुकूलनद्वारा प्रभावित हुन्छ (डार्लिङ-ह्यामन्ड, २०१०)।

पाठ्यक्रमको ऐतिहासिक, दार्शनिक, मनोवैज्ञानिक र सामाजिक जग पाठ्यक्रमको उद्देश्य, विषयवस्तु र सन्दर्भहरूमा प्रतिबिम्बित हुन्छ। अझ विशेष गरी यसका आधारहरू पाठ्यक्रमका लक्ष्य, उद्देश्य, विषयवस्तु, सिकाइ गतिविधिहरू, र मूल्याङ्कन प्रविधिहरूमा प्रतिबिम्बित भएका हुन्छन्। प्रिन्ट (२०२०) द्वारा उद्धृत जाइस (१९७६) को भनाइमा “पाठ्यक्रममा समावेश गरिएका घटकहरू वा तत्त्वहरू (१) ध्येय, लक्ष्य र उद्देश्यहरू; (२) विषयवस्तु वा सामग्री; (३) सिकाइ गतिविधिहरू; र (४) मूल्याङ्कन” हुन्। उक्त घटकहरू वा तत्त्वहरू देशको पाठ्यक्रम विकास गर्ने निकायद्वारा तयार पारिएको लिखित वा योजनाबद्ध पाठ्यक्रमका अङ्गहरूमा अवलोकन गर्न सकिने गरी प्रतिबिम्बित हुन्छन्। पाठ्यक्रमका आधारभूत आयामहरू विश्वभरका देशहरूको विभिन्न सामाजिक-राजनीतिक सन्दर्भहरूमा फरक तरिकाले अभ्यास गरिन्छ। यो अनुसन्धान अध्ययन एउटै पाठ्यक्रमको आधारको विभिन्न सामाजिक रूपमा अवस्थित सन्दर्भहरूमा हुने अभ्यासको फरक तरिकाको बुझाइसँग जोडिएको छ। यस अभ्यासले पाठ्यक्रमको अवधारणा र विकासको प्रक्रियामा अपनाइएको देशअनुसारको कला तथा विज्ञानलाई प्रकट गर्दछ जसले पाठ्यक्रमको तत्त्वहरूमा समाविष्ट सामग्रीहरूमा भिन्नता ल्याउँछ। यस अध्ययनमा अनुसन्धानकर्ताहरूद्वारा विभिन्न २१ देशहरूले अवलम्बन गर्ने विद्यालय तहको पाठ्यक्रमको अवधारणा र प्राथमिकताहरूमा हुने समानता र भिन्नताहरू पत्ता लगाउन खोजिएको छ।

अध्ययनका उद्देश्यहरू

नेपाल र अन्य देशहरूबिचको विद्यालय पाठ्यक्रमको तुलनात्मक अध्ययन तीन उद्देश्यहरूमा केन्द्रित गरिएको छ। ती हुन्:

१. अध्ययनको लागि छनोट गरिएका देशहरूको विद्यालय संरचना र सिकाइ सक्षमता, विषयवस्तु, सिकाइ सहजीकरण र मूल्याङ्कन पक्षहरूको पहिचान गर्न;
२. पाठ्यक्रममा उल्लेख गरिएका दक्षता, विषयवस्तु, सिकाइ सहजीकरण र मूल्याङ्कन क्षेत्रहरूको सन्दर्भमा नेपाल र अन्य छनोट गरिएका देशहरूको पाठ्यक्रमबिचको समानता र भिन्नताहरूको विश्लेषण र पहिचान गर्न;
३. अन्तर-देशीय तुलनात्मक विश्लेषणका आधारमा नेपालको विद्यालय पाठ्यक्रममा सुधार गर्नुपर्ने पक्षहरू/क्षेत्रहरू सिफारिस गर्न।

तथ्याङ्कको विश्लेषण

तथ्याङ्क सङ्कलनको विधि र तथ्याङ्क विश्लेषणको विधिका लागि सामग्री विश्लेषण (content analysis) प्रयोग गरिएको थियो। यसमा प्रयोग गरिएको सामग्री विश्लेषण (content analysis) विधि सहायक तथ्याङ्क विश्लेषण गर्न अनुसन्धान प्रयोग गरिने धेरै विधिहरूमध्ये एक हो। यो अनुसन्धान कार्यमा महादेशहरूको प्रतिनिधित्व गर्ने देशहरूको शिक्षा नीति र विषयगत पाठ्यक्रम (विज्ञान, गणित, र भाषा) जस्ता तथ्याङ्क स्रोतहरूबाट आवश्यक तथ्याङ्क सङ्कलन गरिएको छ। सामग्री विश्लेषण (content analysis) मा विभिन्न प्रकारका दस्तावेजहरूबाट मुख्य विचारहरू र तिनका स्वरूपहरूको सङ्कलन गर्ने, क्रमबद्धता मिलाउने, समीक्षा गर्ने, कोडिङ र डिकोडिङ गर्ने तथा अर्थ निकाल्ने प्रक्रियाहरू समावेश छन्। यस अनुसन्धानमा प्रयोग भएको गुणात्मक अनुसन्धान ढाँचाले एक संरचनागत र पुनरावृत्ति दृष्टिकोण प्रदान गर्दछ जुन विविध राष्ट्रिय सन्दर्भहरूमा पाठ्य वा वृत्तचित्र तथ्याङ्क विश्लेषण गर्न विशेष गरी उपयोगी छ। क्रेसवेलको फ्रेमसँग मेल खाने यो सामग्री विश्लेषण पद्धतिमा गुणात्मक तथ्याङ्क विश्लेषण अन्तर्गतको ढाँचा र विषयवस्तुहरू पहिचान गर्ने व्यवस्थित कोडिङ र वर्गीकरण प्रक्रिया समावेश भएको हुन्छ। यो तथ्याङ्क व्यवस्थित गर्ने र तयार गर्न

प्रक्रियाको सुरुमा हुन्छ, यस प्रक्रियालाई अर्थपूर्ण जानकारीको प्राप्तिको लागि विस्तृत पठन कार्य गर्नु पर्ने हुन्छ । क्रेसवेल (२०१४) ले अन्तर-देशीय तुलनाहरूका लागि सन्दर्भात्मक संवेदनशीलता कायम राख्ने कुरालाई महत्त्व दिएका छन् । देशहरूमा कोड र विषयवस्तुहरू मात्र एकरूप छैनन् कि सांस्कृतिक र प्रणालीगत भिन्नताहरूको आधारमा पनि अनुकूलनीय छन् । यसका लागि प्रायः नयाँ अन्तर्दृष्टिहरू देखा पर्दा कोड र विषयवस्तुहरूलाई परिष्कृत गर्ने पुनरावृत्ति प्रक्रिया आवश्यक पर्दछ । यस अनुसन्धान प्रक्रियाले इमानदारीपूर्वक क्रेसवेलको "तथ्याङ्क विश्लेषण स्पाइरल" को तथ्याङ्क भित्र डुब्ने, अर्थ्याउने तथा प्रतिनिधित्व गराउने बिचको तरल रूपमा चल्ने प्रक्रियालाई कायम राखेको छ, जसले गर्दा शैक्षिक नीतिहरू, पाठ्यक्रम, वा परिचालन संरचनाहरू राष्ट्रहरूमा कसरी फरक हुन्छन् भन्ने बारे सूक्ष्म बुझाइ प्राप्त गर्न सकिन्छ । यो तुलनात्मक अध्ययनको लागि नमुना एक्काइस देशहरू समावेश गरिएको थियो ।

प्रमुख निष्कर्षहरू

- विभिन्न देशहरूमा नेपालको स्कूल स्तरको पाठ्यक्रमको अन्य देशसँग क्रस-कन्ट्री तुलनाको आधारमा, ECDE देखि कक्षा १२ सम्म गणित, विज्ञान र भाषाहरूमा पाठ्यक्रममा धेरै अन्तर्दृष्टिहरू देखा पर्दछन् । नेपालमा पाठ्यक्रम अन्तरहरू विशेष गरी गणित, विज्ञान र पहिलो र दोस्रो भाषाहरूमा, ECDE देखि-कक्षा १२ देख्न सकिन्छ जसले शिक्षकको शिक्षण र विद्यार्थीहरूको सिकाइमा असर गर्छ ।
- नेपाल, भारत, चीन, भुटान, जापान, दक्षिण कोरिया, बङ्गलादेश, मलेसिया, सिङ्गापुर र श्रीलङ्का लगायत धेरै एसियाली देशहरूमा स्कूल-स्तरीय पाठ्यक्रमले साझा मूल्य र नैतिकतालाई जोड दिन्छ । नागरिक जिम्मेवारी, नैतिक वृद्धि र सांस्कृतिक पहिचानलाई बढावा दिन्छ ।
- सिङ्गापुर, अस्ट्रेलिया र फिनल्यान्ड जस्तै नेपालमा स्कूल-स्तरीय पाठ्यक्रमले व्यवहारकुशल सिप, जीवनभर सिकाइ, र सामुदायिक साझेदारीलाई रचनात्मक सिकाइ सिद्धान्तमा आधारित एकीकृत गर्छ ।
- भुटान समग्र राष्ट्रिय खुसीमा आफ्नो अद्वितीय आधारमा देखिएको छ, भावनात्मक कल्याण र नैतिक मूल्यहरूमा गहिरो रूपमा केन्द्रित छ, जुन नेपालमा कम स्पष्ट छ ।
- अमेरिकामा पाठ्यक्रम निर्माण राज्य र जिल्लाहरूमा सङ्घीय दिशानिर्देशनहरूभित्र स्थानीय स्वायत्तता छ, विशिष्ट लक्ष्यहरू वरिपरि सिकाइ संरचना गर्न पछाडिको डिजाइन प्रयोग गर्छ, जुन नेपालको केन्द्रीकृत निर्देशित प्रणालीभन्दा फरक छ ।
- क्यानडाले आफ्नो पाठ्यक्रम विद्यार्थी-केन्द्रित र समान सिद्धान्तहरूमा निर्माण गर्छ, सबै विद्यार्थीहरूका लागि पहुँच सुनिश्चित गर्न सिकाइका लागि विश्वव्यापी डिजाइन लागु गर्छ, जुन नेपालका लागि प्रस्ट देखिएको विशिष्ट दृष्टिकोण हो ।
- नेपालमा विद्यालय स्तरको पाठ्यक्रमले दक्षता-आधारित पाठ्यक्रम अपनाएर विद्यार्थी-केन्द्रित सिकाइको प्राथमिकतालाई प्रतिबिम्बित गर्छ तर सामग्री वर्णनकर्ताहरू, विशेष गरी गणित, विज्ञान र भाषामा धेरै कमजोर पाइन्छ ।
- नेपालको पाठ्यक्रमले परम्परा र आधुनिकतालाई सन्तुलनमा राखेर सांस्कृतिक सान्दर्भिकतालाई सुदृढ बनाउँछ, विशेष गरी विज्ञानमा स्वदेशी ज्ञान समावेश गर्छ तर गणित, भाषाहरू साथै विज्ञानमा समावेशिता धेरै कमजोर छ ।
- डिजिटल सिकाइ र ICT एकीकरण विश्वव्यापी रूपमा बढ्दै गएको छ र नेपालको पाठ्यक्रम सुधार प्रयासहरूभित्र प्रमुखता प्राप्त गर्दैछ ।
- सिङ्गापुर जस्ता देशहरूले ठोस-चित्र-सार (CPA) मोडेल जस्ता नवीन विधिहरू प्रयोग गर्छन्, र फिनल्यान्डले अवधारणात्मक बुझाइलाई जोड दिन्छ, जुन विशिष्ट शैक्षिक दृष्टिकोणहरू हुन् तिनीहरू नेपालको प्राथमिक तहको लागि स्पष्ट रूपमा उल्लेख गरिएको छैन ।
- अस्ट्रेलिया र दक्षिण अफ्रिकाले विज्ञानलाई सामाजिक र नैतिक खोजका रूपमा समावेश गर्छ, विज्ञानलाई मानव सन्दर्भसँग जोड्छ । नेपालले आफ्नो दक्षतालाई समृद्ध बनाउन नैतिक तर्क र विज्ञान-समाज लिङ्कहरूको स्पष्ट समावेशबाट लाभ उठाउन सक्छ । जापान, सिङ्गापुर र मलेसिया जस्ता राष्ट्रहरूले पनि वैज्ञानिक साक्षरतामा रचनात्मकता, मोडेलिङ र नैतिकतालाई प्रवर्धन गर्छन् ।

- नेपालको अङ्ग्रेजी पाठ्यक्रमलाई समृद्ध बनाउन, वास्तविक-विश्व सञ्चार आवश्यकताहरू र सांस्कृतिक सान्दर्भिकतासँग सिकाइ सामग्रीहरू मिलाउन, आकर्षक पाठहरू, उमेर-उपयुक्त साहित्य र दृश्य/श्रव्य स्रोतहरू समावेश गर्ने र स्वास्थ्य, वातावरण, प्रविधि र सामाजिक मूल्याङ्कनहरूसँग सम्बन्धित विषयवस्तुहरू एकीकृत गर्ने सुझाव दिइएको छ ।
- नेपालमा कक्षा १ देखि अङ्ग्रेजी अनिवार्य विषयका रूपमा सुन्ने, बोल्ने, पढ्ने र लेख्ने कुरामा जोड दिँदै, शब्दावली र व्याकरणको विकासमा आधारित छ । अन्य एसियाली देशहरूले प्रारम्भिक रूपमा अङ्ग्रेजी पढाउँछन् र सञ्चार क्षमता, बोध र सन्दर्भसापेक्ष व्याकरणमा ध्यान केन्द्रित गर्छन् । सिङ्गापुर र मलेसिया, जसले अङ्ग्रेजीलाई निर्देशनको माध्यमका रूपमा प्रयोग गर्छन्, सुरुदेखि नै मानक भाषा सिपहरू समावेश गर्छन् ।
- संयुक्त राज्य अमेरिका र क्यानडाको विपरीत, जुन राज्यव्यापी वा प्रान्तीय मानकीकृत परीक्षणमा धेरै निर्भर छन्, नेपालले आन्तरिक र बाह्य दुबै मूल्याङ्कनसँग मिश्रित दृष्टिकोण प्रयोग गर्छ ।
- चीन र दक्षिण कोरिया जस्ता देशहरूले उच्च-सरोकारवाला (high-stake) राष्ट्रिय परीक्षाहरू (जस्तै: गाओकाओ र CSAT) प्रयोग गर्छन्, जबकि फिनल्यान्डले लोस्टेक सरल मूल्याङ्कन प्रणाली अपनाउँछन्; नेपालको परीक्षाको सघनतालाई स्पष्ट रूपमा "हाइ-स्टेकका रूपमा समान रूपमा वर्गीकृत गरिएको छैन, तर यसले राष्ट्रिय-स्तरको परीक्षाहरू प्रयोग गर्छ ।
- अस्ट्रेलियाले लचिलो, सोधपुछकेन्द्रीत मूल्याङ्कनको साथ विद्यार्थीको जिज्ञासालाई बढावा दिन्छ, जुन नेपालको परम्परागत मूल्याङ्कन दृष्टिकोणहरू भन्दा फरक छ ।
- नेपालमा भाषा सिकाइ, विशेष गरी दोस्रो भाषा (L2) का सन्दर्भमा, व्यावहारिक र अभिव्यक्तिपूर्ण प्रयोगमा विशेष रूपमा धनी छ, जसले विश्वव्यापी विचारहरूसँग संलग्न हुँदै यसको पाठ्यक्रमलाई स्थानीय आवश्यकतामा अझ बढी सम्बन्धित छ ।
- नीतिगत प्रावधानहरूको बावजुद, केन्द्रीकृत पाठ्यक्रम विकास प्रक्रियाले नेपालमा स्कूल-आधारित वा स्थानीयकृत पाठ्यक्रम डिजाइनलाई पूर्ण रूपमा अँगालेको छैन ।
- कक्षाहरूमा सिकाइ प्रगतिमा कमजोर सुसङ्गतता छ, विशेष गरी प्रमुख सङ्क्रमण बिन्दुहरूमा (जस्तै: कक्षा ३-४, ८-९, १०-११) । विद्यार्थीहरूले आफ्ना अपेक्षाहरूमा अचानक परिवर्तनहरूको सामना गर्छन् (जस्तै: पूर्ण ढाँचा बिना मौखिकबाट लिखित भाषा कार्यहरूमा वा ठोसबाट अमूर्त गणितमा सर्ने) । गणितमा बीजगणित कक्षा ८ मा पहिलेका कक्षाहरूबाट पर्याप्त विचार निर्माण बिना नै प्रस्तुत गरिएको छ ।
- धेरैजसो सामग्री सैद्धान्तिक छ र विद्यार्थीहरूको जीवनबाट विच्छेदित छ । विज्ञान पाठ्यपुस्तकहरूले स्थानीय जैविक विविधतालाई बेवास्ता गर्दै विदेशी पारिस्थितिक प्रणालीहरूको वर्णन गरेको जस्तो देखिन्छ; भाषा पाठ्यपुस्तकहरूमा नेपालको जातीय र भाषिक विविधताको प्रतिनिधित्वको कमी हुन सक्छ । अङ्ग्रेजी भाषा सामग्रीहरूले प्रायः ब्रिटिश वा अमेरिकी सन्दर्भहरूलाई प्राथमिकता दिन्छन्, प्रासङ्गिकता र संलग्नतालाई सीमित गर्छ ।

पाठिके नेपालका लागि कार्यगत सुझावहरू

नेपालमा स्कूल-स्तरको पाठ्यक्रम एक महत्वपूर्ण क्षणमा उभिएको छ जहाँ सुधारले लचिलोपन, शिक्षक स्वायत्तता र प्रासङ्गिक प्रासङ्गिकतालाई प्राथमिकता दिनुपर्छ । स्थानीय वास्तविकताहरूमा आधारित योजनाहरू अनुकूलन गर्न अभ्यासकर्ताहरूलाई सशक्त बनाएर, र विश्वव्यापी विकासहरू प्रतिबिम्बित गर्न पाठ्यक्रम सामग्री नियमित रूपमा अद्यावधिक गरिएको कुरा सुनिश्चित गरेर, प्रणालीले विविध सिकाइ समुदायहरूलाई राम्रोसँग सेवा दिन सक्छ । बलियो ICT पूर्वाधार र पेसागत विकासमार्फत आलोचनात्मक सोच, सहकार्य र डिजिटल साक्षरता जस्ता व्यवहारकुशल सिपहरूलाई एकीकृत गर्नमा पनि प्रमुख जोड दिनुपर्छ । समावेशी र अनुकूलनीय सामग्रीहरू फरक पृष्ठभूमिका विद्यार्थीहरूसम्म पुग्नुपर्छ, जबकि मूल्याङ्कन अभ्यासहरू विद्यार्थीको बुझाइलाई साँच्चै प्रतिबिम्बित गर्ने रचनात्मक र परियोजना-आधारित विधिहरूसँगै सर्नुपर्छ । अर्थपूर्ण र दिगो परिवर्तन सिर्जना गर्न, पाठ्यक्रम सुधारले विज्ञान र गणित सामग्रीलाई स्थानीयकरण गरेर र भाषा पाठहरूलाई विविधीकरण गरेर सुसङ्गतता, गहिराइ र वास्तविक-विश्व

सान्दर्भिकतामा केन्द्रित हुनुपर्छ । सक्षमतामा आधारित (competency-based) प्रश्नपत्र बैङ्कहरू (Item Banks) सहित निर्माणात्मक र निर्णयात्मक मूल्याङ्कनको ठुलो सन्तुलनले हाइ-स्टेक परीक्षाहरूबाट टाढा जान मद्दत गर्ने छ । फिनल्यान्ड, ब्राजिल र क्यानडा जस्ता विश्वव्यापी मोडेलहरूबाट प्रेरणा लिँदै, नेपालले सिकाइको लागि सर्वव्यापी डिजाइन र स्पष्ट ज्ञान प्रगतिहरू अँगालेर अन्तरविषय, सिकारू-केन्द्रित दृष्टिकोणहरूलाई बलियो बनाउन सक्छ । यस विकासलाई समावेशी, अनुकूलनीय, र स्थानीय संस्कृति र विश्वव्यापी नागरिकता दुबैमा गहिरो जरा गाडिएको पाठ्यक्रम बनाउन निरन्तर अनुसन्धान, समुदाय सहभागिता र शिक्षक-नेतृत्वको नवप्रवर्तनको आवश्यकता पर्ने छ । त्यसकारण CDC द्वारा विचार गरिने अध्ययन निष्कर्षका प्रभावहरू तल स्पष्ट रूपमा दिइएको छ

पाठ्यक्रम योजना र नीतिसँग सम्बन्धित सुझावहरू

- स्थानीय आवश्यकताहरूमा आधारित विषयवस्तुअनुरूप पाठ्यक्रम ढाँचा तयार गर्न विद्यालयहरूलाई अझ बढी स्थानीय स्वायत्तता र लचिलोपन प्रदान गर्नुपर्ने ।
- जापान, चीन र दक्षिण कोरिया जस्ता देशहरूबाट अन्तर्दृष्टि लिँदै पाठ्यक्रमभित्र नैतिक शिक्षा र नागरिक जिम्मेवारी शिक्षाको निम्ति संरचनात्मक बढावमा जोड दिनुपर्ने ।
- नेपालको शैक्षिक जगलाई समृद्ध बनाउन भावनात्मक कल्याण र नैतिक मूल्यहरूमा गहिरो रूपमा केन्द्रित कुल राष्ट्रिय खुसीका सिद्धान्तहरूको अनुसन्धान र एकीकृत गर्नुपर्ने ।
- आधारभूत स्तरमा "गणितीय ज्ञान, सिप, सोच र दृष्टिकोण र तिनको दैनिक जीवनमा प्रयोग " मा स्पष्ट जोड कायमै राख्नुपर्ने किनकि यो विस्तृत अभिव्यक्ति एक उल्लेखनीय भिन्नता हो ।
- सिङ्गापुरमा प्रयोग गरिएको ठोस-चित्र-सार (CPA) मोडेल र फिनल्यान्डले बोध र धारण सुधार गर्न अवधारणात्मक बुझाइमा जोड दिने जस्ता नवीन विधिहरू खोज र एकीकरण गर्नुपर्ने ।
- फिनल्यान्ड, अस्ट्रेलिया, दक्षिण कोरिया, दक्षिण अफ्रिका र ब्राजिलमा देखिए जस्तै विद्यार्थीहरूलाई अमूर्त सिपहरूलाई दैनिक परिस्थितिहरूमा जोड्न मद्दत गर्दै, व्यापक सामाजिक, वातावरणीय वा उद्यमशीलता क्षमताहरूभित्र गणितीय साक्षरता स्पष्ट रूपमा समाहित गर्नुपर्ने ।
- गणित पाठ्यक्रममा बाहिरी सिकाइ अनुभवहरू समावेश गर्न खोज गर्नुपर्ने, जुन डेनमार्क र अस्ट्रेलियामा सामान्य अभ्यास रहेको छ तर नेपाल जस्ता दक्षिण एसियाली प्रणालीहरूमा कम छ ।
- भुटान र जापानका दृष्टिकोणहरूबाट प्रेरणा लिँदै, विज्ञान सिकाइलाई सांस्कृतिक र भावनात्मक विकाससँग जोड्न प्रयास गर्नु पर्ने ।
- फिनल्यान्ड, अस्ट्रेलिया र दक्षिण कोरियामा जोडहरूसँग पङ्क्तिबद्ध गर्दै, सोधपुछ सिप, नैतिक तर्क र दिगोपनलाई विज्ञान विषयवस्तुमा अझ गहिरो रूपमा एकीकृत गर्नुपर्ने ।
- ब्राजिल र तान्जानियालाई प्रतिबिम्बित गर्दै विज्ञान मूल्याङ्कनमा मोडेलिङ र वास्तविक जीवन समस्या समाधानलाई प्राथमिकता दिनुपर्ने ।
- क्यानडा र संयुक्त राज्य अमेरिकालाई पछ्याउँदै, सोधपुछ-आधारित, अन्तर-विधागत सिकाइलाई बढावा दिई विज्ञानको विषयवस्तुलाई समस्या समाधान र मूल्याङ्कनमा नागरिक संलग्नतासँग जोड्नुपर्ने ।
- मूल्याङ्कनमा सोधपुछ, तथ्याङ्क विश्लेषण, र व्यावहारिक अनुसन्धानहरूलाई मार्गदर्शन गर्न राष्ट्रिय वा प्रान्तीय रूपरेखाहरू सिर्जना वा तयार गर्नुपर्ने ।
- रचनात्मकता, शैक्षिक लेखन र सांस्कृतिक प्रवाह समावेश गर्न भाषा दक्षताहरू फ्रेम विकास गरी खोज गर्ने ।
- विस्तृत र सन्दर्भ-विशिष्ट विषयगत पाठ्यसामग्री विकास गर्न जारी राख्ने जसले समृद्ध, अधिक व्यावहारिक भाषिक परिवेश प्रदान गर्नुपर्ने ।

- सिकाइ सामग्रीहरूलाई वास्तविक-विश्व सञ्चार आवश्यकताहरू र सांस्कृतिक सान्दर्भिकतासँग मिलाउन आकर्षक पाठहरू, उमेर-उपयुक्त साहित्य र दृश्य/श्रव्य स्रोतहरू समावेश गर्ने र स्वास्थ्य, वातावरण, प्रविधि, र सामाजिक मूल्यहरूसँग सम्बन्धित विषयवस्तुहरूलाई एकीकृत गर्नुपर्ने ।
- भारत, चीन, सिङ्गापुर र मलेसिया जस्तै मल्टिमिडिया पाठ, भर्चुअल प्रयोगशाला, वा स्मार्टबोर्ड जस्ता ICT उपकरणहरू र डिजिटल स्रोतहरूको एकीकरण बढाउनुपर्ने ।

थप अनुसन्धान कार्यहरूसँग सम्बन्धित सुझावहरू

- पाठ्यक्रम विकास टोली (curriculum development team) लाई मार्गदर्शन गर्न पाठ्यक्रम विकास मोडेल (curriculum development model) मा नवीनता ल्याउन अनुसन्धान गर्नुपर्ने ।
- पाठ्यक्रम योजना सुधार गर्न दक्षता, सिकाइ परिणाम, रणनीति र मूल्याङ्कन प्रणालीहरूको सान्दर्भिकता र व्यावहारिकता जाँच गर्न मूल्याङ्कनसम्बन्धी -अनुसन्धान गर्नुपर्ने ।
- नेपालमा विद्यार्थी सिकाइ परिणाम र शिक्षकको पेसागत विकासमा पाठ्यक्रम अनुकूलनमा बढी स्थानीय स्वायत्तता प्रदान गर्दाको प्रभावहरूको अनुसन्धान गर्नुपर्ने ।
- विद्यार्थीको बुझाइ, समालोचनात्मक सोच र नागरिक संलग्नतामा विज्ञान र गणित पाठ्यक्रममा नैतिक तर्क र विज्ञान र समाजलाई जोडेको रूपमा समावेश गर्दाको प्रभावकारिताको अध्ययन गर्नुपर्ने ।
- विभिन्न विषयहरूमा नेपालका कक्षाकोठाहरूमा नवीन शैक्षिक रणनीतिहरू (जस्तै: गणितमा CPA विधि, बाहिरी सिकाइ, प्रदर्शन-आधारित मूल्याङ्कन) समावेश गर्ने प्रभावकारिताको मूल्याङ्कन गर्न अध्ययनहरू सञ्चालन गर्नुपर्ने ।
- उत्कृष्ट अभ्यासहरूको अनुसन्धान गर्ने र नेपालको पाठ्यक्रमका सबै विषयहरूमा महत्वपूर्ण व्यवहारकुशल सिपहरू (सिर्जनशीलता, डिजिटल साक्षरता, सहकार्य, विश्वव्यापी जागरूकता) लाई व्यवस्थित रूपमा एकीकृत गर्नका लागि रूपरेखा विकास गर्नुपर्ने ।
- विश्वव्यापी नागरिकता र स्थानीय नवप्रवर्तनका लागि विद्यार्थीहरूलाई तयार पार्न व्यापक सामाजिक, वातावरणीय र उद्यमशील दक्षताहरू भित्र गणितीय र वैज्ञानिक साक्षरतालाई प्रभावकारी रूपमा सम्मिलित गर्ने भन्ने बारेमा अनुसन्धान गर्नुपर्ने ।

Executive Summary

A curriculum is an essential document that outlines the educational competencies, learning contents, teaching strategies/learning facilitation, and assessment schemes. The term “curriculum” has two meanings – a narrow and a broad understanding. In its narrow understanding, it refers to planned contents of various subjects, whereas in its broad sense, it refers to all experiences provided by school to impact the students’ personal development opportunities, which include goals/competencies, contents, facilitation procedures, and evaluation methods, along with the prescribed learning materials of text and references. This research project covers not only the narrow sense but also the broad one. Thus, the curriculum development plays a vital role in the education system, influencing students' learning experiences and equipping them for future challenges (Bray et al., 2014). The effectiveness of an education system is influenced by the curriculum's relevance, inclusivity, and adaptability (Darling-Hammond, 2010).

The historical, philosophical, psychological, and social foundations of curriculum are reflected in the intents, contents, and contexts. More specifically, the foundations are the influencing factors on curriculum goals, objectives, contents, learning activities, and assessment techniques. For Zais (1976) as cited by Print (2020), “the components or elements included in a curriculum are (1) aims, goals, and objectives; (2) subject matter or content; (3) learning activities; and (4) evaluation”. The influencing factors that can be observed are reflected in the components of the written or planned curriculum prepared by a curriculum development agency of a country. The curriculum's foundational dimensions are practiced differently in different socio-political contexts of countries across the globe. This study is aligned with an understanding of the same foundation, a different way of practice in different socially situated contexts. The practice reveals the country-specific art and Science adopted in the process of curriculum conceptualization and development, which makes a difference in the contents inserted into the curriculum components. In this study, the researchers have delved into exploring similarities and differences in curriculum conceptualization and preferences made in the different 21 countries.

Objectives of the Study

The comparative study of school curriculum between Nepal and other countries has concentrated on three objectives. They are:

1. To identify the levels of school structure and their competencies, contents, learning facilitations, and assessment areas of education of the countries selected for the study;
2. To analyze and identify the similarities and differences between the curricula of Nepal and other selected countries in terms of the competencies, contents, learning facilitations, and assessment areas mentioned in them;
3. To recommend the aspects/areas to be improved in the school curriculum of Nepal, relying on the cross-country comparative analysis.

Research Methodology

Content analysis is used for both a method of data collection and a method of data analysis. Content analysis is one of the numerous research methods used to analyze text data. It is used to explore required data from data sources like education policy and subject curricula (Science, Mathematics, and language) of the countries representing continents in this research work. Content analysis involves a process of collecting, sorting, reviewing, coding and decoding, eliciting meaning, and extracting key ideas and categories from the documents of different forms. Creswell’s qualitative research framework offers a structured and iterative approach that is especially useful for analyzing textual or documentary data across diverse national contexts. In line with Creswell’s frame, this content analysis has involved a systematic coding and categorizing process to identify patterns and themes within qualitative data. This begins with organizing and preparing the data, followed by a detailed reading to gain a general sense of the information. For cross-country comparisons, Creswell (2014) emphasizes the importance of maintaining contextual sensitivity, ensuring that codes and themes are not only consistent across countries but also adaptable to cultural and systemic differences. This often requires a recursive process of refining codes and themes as new insights emerge. This research process has honestly maintained Creswell’s “data analysis spiral,” moving fluidly between data immersion, interpretation, and representation, allowing for a nuanced understanding of how educational policies, curricula, or governance structures vary across nations. The sample for this comparative study was of twenty-one countries.

Key Findings

Based on the cross-country comparison of school-level curriculum of Nepal and the selected countries, several insights emerged across the curriculum from ECED to Grade 12 in Mathematics, Science, and languages. Curriculum gaps in Nepal (ECED–Grade 12) can be seen, which affect teachers and students, particularly in Mathematics, Science, and first and second languages

- School-level curricula in many Asian countries, including Nepal, India, China, Bhutan, Japan, South Korea, Bangladesh, Malaysia, Singapore, and Sri Lanka, tend to emphasize shared values and ethics, fostering civic responsibility, moral growth, and cultural identity.
- The school-level curriculum in Nepal, like in Singapore, Australia, and Finland, integrates soft skills, lifelong learning, and community learning based on constructivist learning theory.
- Bhutan stands out for its unique foundation on Gross National Happiness, focusing deeply on emotional well-being and ethical values, which is an orientation of Nepal in its education policy.
- In the U.S., states and districts have local autonomy within federal guidelines, using backward design to structure learning around specific goals. In the present federal State

structure of Nepal, it has ensured through the national education policy and the NCF document to develop curriculum at the provincial and local levels as well.

- Canada builds its curriculum on learner-centered and equitable principles, applying the Universal Design for Learning to ensure accessibility for all students, a specific approach being highlighted for Nepal as well.
- The school-level curriculum in Nepal reflects the priority of student-centered learning through its adoption of a competency-based curriculum, but the content descriptors, especially in Mathematics, Science, and language, have still space for further improvement.
- Like in other countries, Nepal has reinforced the cultural relevance by balancing tradition and modernity, incorporating indigenous knowledge in the curriculum, especially in Science.
- Digital learning and ICT integration are growing globally and are gaining prominence within Nepal's curriculum reform efforts.
- Countries like Singapore use innovative methods such as the Concrete-Pictorial-Abstract (CPA) model, and Finland emphasizes conceptual understanding, which are specific pedagogical approaches not explicitly mentioned for Nepal's primary level.
- Australia and South Africa embed Science as a social and ethical pursuit, connecting Science to human contexts. Nepal may benefit from more explicit inclusion of ethical reasoning and Science-society links to enrich its competencies. Nations like Japan, Singapore, and Malaysia also promote creativity, modeling, and ethics in scientific literacy.
- For further enrichment of Nepal's English curriculum, aligning learning materials with real-world communication needs and cultural relevance, incorporating engaging texts, age-appropriate literature, and visual/audio resources, and integrating diverse themes.
- In Nepal, English is compulsory from Grade 1, with emphasis on listening, speaking, reading, and writing, supported by vocabulary and grammar development. In line with Nepal's curriculum, other Asian countries also introduce English early grades and focus on communicative competence, comprehension, and contextual grammar. Singapore and Malaysia, which use English as a medium of instruction, embed advanced language skills from the start.
- In contrast to the USA and Canada, which rely heavily on statewide or provincial standardized testing, Nepal uses a mixed approach with both internal and external assessments.
- Countries like China and South Korea use high-stakes national exams (e.g., Gaokao and CSAT), while Finland follows low-stakes simple assessments; Nepal's intensity of exams isn't explicitly categorized as "high-stakes" in the same way, but it does use national-level exams.
- Australia fosters student curiosity with flexible, inquiry-driven evaluation, which differs from Nepal's more traditional assessment approaches.

- Language learning in the schools of Nepal, especially in second language (L2) contexts, is notably rich in practical and expressive use, further anchoring its curriculum in local needs while engaging with global ideas.
- The centralized curriculum development process has not fully embraced school-based or localized curriculum design in Nepal, despite policy provisions.
- There is weak coherence in learning progression across grades, especially at key transition points (e.g., Grades 3–4, 8–9, 10–11). Students face abrupt shifts in expectations, such as moving from oral to written language tasks or from concrete to abstract Mathematics, without adequate scaffolding. In Mathematics, algebra is introduced in Grade 8 without sufficient conceptual buildup from earlier grades.
- Much of the content of science should be made more practical and connected with students' lives. Science textbooks have described foreign ecosystems, and have rare concern on local biodiversity. English language materials often prioritize British or American contexts, limiting relevance and engagement.

Actionable Implications for CDC Nepal

The school-level curriculum in Nepal stands at a pivotal moment where reform must prioritize flexibility, teacher autonomy, and contextual relevance. By empowering practitioners to adapt plans based on local realities and ensuring that curricular content is regularly updated to reflect global developments, the system can better serve diverse learning communities. Key emphasis should also be placed on integrating soft skills such as critical thinking, collaboration, and digital literacy through robust ICT infrastructure and professional development. Inclusive and adaptive materials must reach students from varying backgrounds, while assessment practices should shift toward formative and project-based methods that truly reflect student understanding. To create meaningful and lasting change, curriculum reform should focus on coherence, depth, and real-world relevance through localizing Science and math content and diversifying language texts. A greater balance of formative and summative assessments, including competency-based item banks, will help move away from high-stakes exams. Drawing inspiration from global models such as Finland, Brazil, and Canada, Nepal can strengthen interdisciplinary, learner-centered approaches by embracing Universal Design for Learning and clearer knowledge progressions. This evolution will require ongoing research, community participation, and teacher-led innovation to craft a curriculum that is inclusive, adaptive, and deeply rooted in both local culture and global citizenship. Therefore, the implications of the study's findings for the CDC are outlined below.

Related to Curriculum Plan and Policy

- Consider allowing greater local autonomy and flexibility in the curriculum framework for schools to adapt content based on local needs.

- Enhance the structural emphasis on moral education and civic responsibility within the curriculum, drawing insights from countries like Japan, China, and South Korea, which prioritize these aspects.
- Investigate and integrate principles of Gross National Happiness, which focus deeply on emotional well-being and ethical values, to enrich Nepal's educational foundation.
- Maintain the explicit emphasis on "mathematical knowledge, skills, thinking and attitude and application in daily life" at the basic level, as this detailed articulation is a notable difference.
- Explore integrating innovative methods like the Concrete-Pictorial-Abstract (CPA) model used in Singapore and Finland's emphasis on conceptual understanding to improve comprehension and retention.
- Explicitly embed mathematical literacy within broader social, environmental, or entrepreneurial competencies, helping learners connect abstract skills to everyday situations, as seen in Finland, Australia, South Korea, South Africa, and Brazil.
- Explore incorporating outdoor learning experiences into the Mathematics curriculum, a practice common in Denmark and Australia but less so in South Asian systems like Nepal.
- Explore connecting Science learning with cultural and emotional development, drawing inspiration from approaches in Bhutan and Japan.
- Integrate inquiry skills, ethical reasoning, and sustainability more deeply into the Science content, aligning with emphases in Finland, Australia, and South Korea.
- Prioritize modeling and real-life problem-solving in Science assessments, mirroring Brazil and Tanzania.
- Foster inquiry-based, cross-disciplinary learning and link Science content to problem-solving and civic engagement in assessments, following Canada and the USA.
- Create national or provincial frameworks to guide inquiry, data analysis, and hands-on investigations in assessments.
- Explore framing language competencies to include creativity, academic writing, and cultural fluency.
- Continue developing elaborate and context-specific thematic content, which provides a richer, more practical linguistic context.
- Align learning materials with real-world communication needs and cultural relevance, incorporating engaging texts, age-appropriate literature, and visual/audio resources, and integrating themes related to health, environment, Technology, and social values.
- Increase the integration of ICT tools and digital resources like multimedia lessons, virtual labs, or smart boards, similar to India, China, Singapore, and Malaysia.

Related to Further Research Works

- Conduct research to innovate a curriculum development model to guide the curriculum development team.

- Carry out evaluation research to examine the relevance and practicability of the competencies, learning outcomes, strategies, and assessment systems to improve curriculum planning.
- Conduct research on the effects of granting greater local autonomy in curriculum adaptation on student learning outcomes and teacher professional development in Nepal.
- Study the effectiveness of explicitly including ethical reasoning and Science-society links in Science and Mathematics curricula on student understanding, critical thinking, and civic engagement.
- Conduct studies to evaluate the effectiveness of incorporating innovative pedagogical strategies (e.g., CPA method in math, outdoor learning and performance-based assessments) in Nepal's classrooms across different subjects.
- Research best practices and develop a framework for systematically integrating soft skills (creativity, digital literacy, collaboration, global awareness) across all subjects in Nepal's curriculum.
- Conduct research on how to effectively embed mathematical and scientific literacy within broader social, environmental, and entrepreneurial competencies to prepare students for global citizenship and local innovation.

Abbreviations

CDC	Curriculum Development Centre
TOR	Terms of Reference
MF	Molung Foundation
ECD	Early Childhood Development
ICT	Information and Communication Technology
IBE	International Bureau of Education
SAARC	South Asian Association for Regional Cooperation
RFP	Request for Proposal
SSDP	School Sector Development Plan
CERID	Centre for Educational Research, Innovation and Development
MOEST	Ministry of Education, Science and Technology
NCERT	National Council of Educational Research and Training (India)
BCSEA	Bhutan Council for School Examinations and Assessment
NCTB	National Curriculum and Textbook Board (Bangladesh)
NSC	National Senior Certificate (South Africa)
ENEM	Exame Nacional do Ensino Médio (Brazil)
PSLE	Primary School Leaving Examination (Singapore)
CSAT	College Scholastic Ability Test (South Korea)
ANA	Annual National Assessment (South Africa)
UPSR	Ujian Pencapaian Sekolah Rendah
NAPLAN	National Assessment Program –Literacy and Numeracy (Australia)
GCSE	General Certificate of Secondary Education (UK)
SAT/ACT	Standardized Tests in the United States
CPD	Continuous Professional Development
CAS	Continuous Assessment System

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Chapter One: Introduction

A comparative analysis of school-level curricula highlights the need for Nepal to balance global education trends with local educational needs. This study aims to explore the gap between the curricula of Nepal and other countries and suggest ways to improve the curriculum of Nepal. This chapter consists of context of the study, objectives of the study, research questions, significance of the study, scope of study and delimitation.

Context of the Study

A curriculum is an essential document that outlines the educational competencies, learning materials and content, teaching strategies/learning facilitation, and assessment schemes. The term “curriculum” has two meanings: a narrow and a broad understanding. In its narrow understanding, it refers to planned contents of various subjects whereas in its broad sense, it refers to all experiences provided by school to impact the students’ personal development opportunities, which include goals/competencies, contents, facilitation procedures, and evaluation methods, along with the prescribed learning materials of text and references. The task that this research project covers is not only the narrow sense but also the broad one. Thus, the curriculum development plays a vital role in the education system, influencing students' learning experiences and equipping them for future challenges (Bray et al., 2014). The effectiveness of an education system is influenced by the curriculum's relevance, inclusivity and adaptability (Darling-Hammond, 2010).

In Nepal, the Curriculum Development Center (CDC) is responsible for the curriculum policy and plan development at the school level. The school curriculum has undergone significant changes over the decades, particularly following the introduction of the National Education System Plan in 1971. This plan marked a pivotal shift in Nepal's educational landscape by emphasizing the need for structured learning environments and increasing opportunities for vocational training. According to the Center for Education and Human Resource Development (CEHRD, 2008), the National Education System Plan aimed to create an educational framework that prioritizes academic knowledge and prepares students for practical, skills-based employment.

The development and changes in society have a significant impact on everyone’s lives encompassing factors such as globalization, cultural diversity, artificial intelligence and technological advancement. These changes create a need for them to be adaptable and resilient in the face of constant change. As a result of this, education systems are under pressure to better prepare their citizens for the future empowering them with the necessary competencies to shape their lives and make meaningful contributions to society. This is possible only through revising and refining their curriculum.

In Nepal the National Curriculum Framework for School Education (CDC, 2076 BS) received its approval from the Government of Nepal on September 6, 2019 AD. It introduces significant changes to the school level curriculum. It has included an integrated curriculum for grades 1-3 and a single path curriculum for grades 9-12. It has determined 26 hours for grades 1-

3, 32 hours for grades 4-10 and 27-32 hours for grades 11-12. Schools have also been provided with the flexibility to add one subject of their choice. This curriculum has emphasized the competencies in place of goals of the earlier curricula. It has introduced technology related content from grade 4 and emphasizes on human values and community service as a new approach. Thus, the educational framework has been refined recently by implementing the School Education Sector Plan Nepal (SESP Nepal) from 2022 to 2032. This plan introduced a competency-based approach to curricula, which focuses on enhancing student learning outcomes. It emphasizes developing essential skills that align with the demands of the modern job market, thus preparing students for future employment opportunities (Ministry of Education, Science and Technology [MOEST], 2022).

Despite these progressive reforms, the Nepali educational system faces several enduring challenges. In some curriculum cases, it is found that rote memorization techniques have been incorporated, which may limit students' ability to develop a deeper understanding of the material. This method often leads to superficial learning, as students may focus on memorizing facts rather than engaging with critical concepts. Additionally, there is a pressing need for greater emphasis on developing essential thinking skills in students to navigate complex problems in both academic and real-world contexts. Another significant challenge is the insufficient integration of Technology into teaching and learning processes. This lack of technological engagement hampers students' ability to acquire digital literacy skills crucial for success in an increasingly interconnected and Technology-driven society (Poudel, 2021). Without addressing these challenges, the potential benefits of the curriculum reforms may be limited, and students may continue to struggle to reach their full academic and personal potential. In 1971, particularly following the implementation of the National Education Plan, structured learning environments and vocational training opportunities were prioritized.

The educationally advanced countries, such as Finland, Japan, and the United States, reveal significant insights into diverse educational approaches and methodologies that could be the model to enhance Nepal's educational framework. Finland is often praised for its progressive education system, which prioritizes student-centered learning. This approach prioritizes students' needs and interests, enabling a more personalized learning experience (Helsinki City Education Division, 2020). Finnish curricula are flexible, enabling teachers to modify their instruction to meet their students' diverse abilities and learning styles [Finnish National Agency for Education [EDUFI], 2019]. This adaptability helps foster engagement in learning rather than simply focusing on test scores (Mykrä, 2023). Furthermore, Finland employs minimal standardized testing, with assessments being more formative and integrated into the learning process. As a result, students are evaluated through comprehensive and holistic means that encourage critical thinking and creativity (Sahlberg, 2015). This model suggests that Nepal could benefit from reducing the emphasis on rote memorization and high-stakes testing, instead of focusing on more holistic and formative assessment methods.

Japan's educational system is characterized by a rigorous academic curriculum integrating traditional academic content with moral and holistic education. The Japanese curriculum

emphasizes discipline, respect, and social responsibility, fostering academic success and strong character development among students. Moreover, Japan's learning approach is collaborative and often involves group work, cultivating teamwork and communication skills. Schools encourage students to take pride in their environment by cleaning classrooms and gaining a sense of community and personal responsibility. This combined focus on academic excellence and character education illustrates how Nepal could adopt similar practices to create a more balanced educational environment that values academic achievement and moral development.

In contrast, the U.S. education system emphasizes standardized testing and subject-specific specialization. The curriculum is designed to prepare students for college and careers, often leading to a focus on measurable academic outcomes. This approach can lead to a competitive environment where student success is primarily quantified through test scores and grades. While the U.S. system does incorporate a broad range of subjects, including arts and physical education, the pressure of standardized assessments can overshadow other vital aspects of student development. For Nepal, this highlights the potential pitfalls of an overly test-centric approach and suggests a curriculum that balances academic rigor with opportunities for holistic development, creativity, and critical thinking (Darling-Hammond, 2010). The educational frameworks of Finland, Japan, and the United States present valuable lessons for Nepal. By examining these diverse approaches, Nepal could integrate key elements such as flexible curricula, a focus on moral and character education, and balanced assessment practices. It could enhance student engagement, foster holistic development, and improve the country's education quality.

The influence of global trends on curriculum development has significantly transformed educational approaches worldwide, emphasizing the need for common educational frameworks, skills, and competencies essential for fostering global citizenship (Spring, 2015). In response to this trend, many countries have begun aligning their curricula with international benchmarks, such as the Sustainable Development Goals (SDGs) outlined by the United Nations. These benchmarks serve as guiding principles to ensure that students develop critical thinking and technological skills and have a strong understanding of diverse cultures and global issues (UNESCO, 2021). In the context of Nepal, the nation has been gradually incorporating these global trends into its curriculum development. Educational policymakers increasingly recognize the importance of integrating STEM (Science, Technology, Engineering, and Mathematics) education, environmental education, and digital literacy. This approach aims to equip students with skills relevant to the contemporary context while ensuring that indigenous knowledge and local cultural values are preserved and respected (MOE Nepal, 2019). This dual focus on modern competencies and traditional values reflects an effort to create a holistic educational experience for students in Nepal.

When examining curriculum development strategies in different countries, notable contrasts emerge. For instance, Finland has gained international acclaim for emphasizing personalized learning and competency-based education. The Finnish model prioritizes students' individual learning needs and aligns educational practices with their interests and abilities,

fostering a more engaging learning environment (EDUFI, 2016). On the other hand, Singapore has adopted a more skill-centric approach, focusing on creating a knowledge-based economy. Its curriculum is designed to foster essential skills that prepare students for the demands of a rapidly changing job market, emphasizing the importance of practical competencies and theoretical knowledge (Schleicher, 2018).

The landscape of curriculum development is being reshaped by global influences, prompting countries like Nepal to incorporate contemporary educational trends while valuing traditional knowledge. The emphasis on skills that promote critical thinking, digital proficiency, and cultural understanding is evident. At the same time, diverse models from countries like Finland and Singapore provide alternative approaches highlighting the importance of adapting education to meet local and global challenges. The "think globally, act locally" principle emphasizes that while global educational trends provide essential frameworks and guidelines, the design of a curriculum should be deeply rooted in the specific cultural, social, and economic contexts of each locality (Altbach & Knight, 2007). This approach fosters a more relevant and meaningful learning experience for students.

The educational curriculum in Nepal uniquely integrates traditional knowledge systems and local languages to reflect the nation's rich and diverse ethnic heritage. This effort preserves local cultures and enhances students' connections to their identity and community. At the same time, Nepal's curriculum incorporates global competencies such as proficiency in the English language and crucial digital skills to ensure that students are prepared to engage with an increasingly interconnected world. Japan has effectively localized various global education models by networking elements of moral education and community-based learning into its national curriculum. This integration helps students develop a strong sense of ethical responsibility and community involvement, striking a balance between modernization and the preservation of cultural identity (Cave, 2016).

Similarly, New Zealand's educational framework exemplifies inclusivity and flexibility, allowing individual schools the autonomy to adapt their learning materials to meet local needs better while still adhering to national education standards. This adaptive approach recognizes the diverse backgrounds of students across the country. It seeks to provide a personalized learning experience that prepares them for local and global challenges (Ministry of Education, New Zealand, 2020). These examples illustrate the significance of contextualizing education to enhance its relevance and effectiveness; ensuring students are equipped with local knowledge and global skills.

Different countries adopt varied curriculum development models, each shaped by their unique educational needs, governance structures, and cultural contexts. In Nepal, the curriculum development system is centralized, meaning that a singular authority oversees the curriculum framework for the entire country. Specifically, the Curriculum Development Centre (CDC), which operates under the Ministry of Education (MoE), is responsible for formulating and implementing the national curriculum. This centralized approach allows for consistent educational standards nationwide, ensuring all students have access to the same foundational

content and skills, regardless of geographic location. The curriculum is periodically reviewed and updated to reflect changes in educational goals, societal needs, and global trends (MOE Nepal, 2019).

On the other hand, countries like Canada and Germany adopt a more decentralized curriculum development model. In Canada, the provincial or territorial governments hold the authority to design their curricula, leading to significant local variation. Each province tailors its curriculum to meet its students' needs, considering local culture, demographics, and educational priorities. This flexibility allows for innovation in teaching methods and content that can better serve the diverse student populations across the country (Ontario, n. d.). Similarly, in Germany, the federal structure grants each of the 16 states the autonomy to develop its educational policies and curricula. While national educational standards exist, the implementation varies, allowing states to adapt their curricula to fit regional contexts and needs (Organization for Economic Co-operation and Development [OECD], 2020). These distinct approaches illustrate the interplay between centralization and decentralization in curriculum development, reflecting broader educational philosophies and policy goals unique to each country. Centralized systems prioritize uniform standards and equity, while decentralized models promote flexibility, local relevance, and responsiveness to community needs.

This curriculum study is related to official, planned, intended, or written curriculum. The official curriculum is an authentic curriculum that outlines the prescribed syllabus, educational standards, and specific learning outcomes emphasized by the curriculum authorities. The planned or official curriculum serves as essential guidelines for schools' teaching and learning processes. The planned curriculum has a certain structure consisting of competency, content, teaching and learning strategies, and assessment. In the process of practice, there tends to be a significant gap between the intended and implemented curricula. But the study focuses on the components of the planned curriculum and their differences and similarities in the context of other countries.

A comparative analysis of school-level curricula highlights the need for Nepal to balance global education trends with local educational needs. Lessons from other countries indicate that flexibility, teacher training, and localization are crucial for effective curriculum implementation. Nepal can enhance its curriculum to prepare students for local and global challenges by adopting best practices from international models while preserving cultural heritage.

Objectives of the Study

The comparative study of school curriculum between Nepal and other countries has concentrated on three objectives. They are:

- 1 To identify the levels of school structure and their competencies, contents, learning facilitations, and assessment areas of education of the countries selected for the study;
- 2 To analyze and identify the similarities and differences between the curricula of Nepal and other selected countries in terms of the competencies, contents, learning facilitations, and assessment areas mentioned in them;

- 3 To recommend the aspects/areas to be improved in the school curriculum of Nepal relying on the cross-country comparative analysis.

Research Questions

The research questions have been specified from the research objectives in a more specific manner. Hence, specific research questions have been developed from the research objectives to be answered through the research study. The research questions have the researchers to explore intended research outputs through the specific activities. The research questions are:

1. What are the levels of school structure provisioned by the selected countries in their education and curriculum policy and plan?
2. How are the school subject curricula organized in the school education in the countries?
3. What are competencies, contents, learning facilitations, and assessment set in the school curriculum of the selected countries?
4. What are the similarities and differences found in the school curricula of Nepal and other countries in terms of competencies, contents, learning facilitations, and assessment areas?
5. What are the strong aspects in the curricula of other countries that could be subjects of recommendation to the curriculum policy and plan developers of Nepal for quality enhancement of the school curriculum development?

Significance of the Study

This study is significant as it compares Nepal's school-level curriculum with other countries, offering insights into global best practices in curriculum development. It highlights the impact of globalization on education, emphasizing how Nepal can integrate international educational trends while preserving local cultural values. By examining the principle of "think globally, act locally," the study emphasizes the importance of contextualizing global knowledge to meet Nepal's unique educational needs. It contributes to understanding official (planned) and implemented curricula, identifying gaps and challenges in curriculum implementation. So, the outcomes help policymakers, educators, and curriculum developers make informed decisions to improve Nepal's education system by adopting flexible and innovative teaching strategies.

Additionally, it provides insights into how other countries have successfully balanced global competencies with national identity in their education systems. The findings of this research will support reforms that enhance the relevance, inclusivity, and effectiveness of Nepal's curriculum. It also benefits curriculum policy makers, educational leaders, and teachers by offering comparative perspectives that can improve their approaches and adaptability in a rapidly changing world. Students stand to gain from an improved curriculum that prepares them for local and global challenges. Ultimately, this study contributes to the broader discourse on curriculum development, fostering a more globally competitive yet locally relevant education system in Nepal. Hence, comparative analyses of school curricula from various countries provide insights into effective practices, challenges, and educational policy improvement opportunities (Bereday, 1964).

Scope and Delimitation of the Study

The TOR has clearly mentioned the names of countries to be covered by this research work. They are Nepal, China, India, Bhutan, Japan, Singapore, Malaysia, Shri Lanka, Bangladesh, USA, Canada, Brazil, UK, Denmark, Germany, Finland, Australia, South Korea, South Africa, and Tanzania covering all six continents. Curriculum is vague concept because it not only encompasses the list of teaching contents but also planned, implemented, experienced, attained, and test form of educational activities. The scope of the curriculum study in this research has been delimited to the intended, official, planned, or written curricula. Planned curriculum related information have been obtained from the authentic official websites of the selected countries. The scope of the study stated in the TOR is given in Table 1.

Table 1: Scope mentioned in TOR

Region	Countries	Level/Class
South Asian Countries	India, Bhutan, Bangladesh, Sri Lanka	School Level (Pre-primary to Grade 12/13)
Other Asian Countries	Singapore, Vietnam, China, Japan, South Korea	School Level (Pre-primary to Grade 12/13)
Europe	Finland, Denmark, Germany	School Level (Pre-primary to Grade 12/13)
Africa	South Africa, Tanzania	School Level (Pre-primary to Grade 12/13)
North America	United States, Canada	School Level (Pre-primary to Grade 12/13)
South America	Brazil	School Level (Pre-primary to Grade 12/13)
Australia	Australia	School Level (Pre-primary to Grade 12/13)

Theoretical Framework of Curriculum Comparison

Comparative education offers a systematic and nuanced approach to investigating educational systems across different contexts by closely examining their similarities and differences. It includes an in-depth analysis of various components such as policies, curriculum frameworks, teaching methodologies, and learning outcomes (Bray et al., 2014). One of the new figures in this field, Bereday (1964), introduced a comprehensive four-step model for comparative education: description, interpretation, association, and comparison. This model is a foundational framework for conducting rigorous comparative studies in curriculum research.

The description step involves a detailed account of the educational system being studied, including its historical context, structural components, and overall aims. For instance, this could include describing Nepal's educational policies, the structure of its curriculum, and the key subjects taught at various levels of education. In the interpretation phase, researchers seek to understand the descriptions' implications. It might involve exploring the cultural, social, and political factors that shape Nepal's educational practices and how they compare to other countries. The association step entails placing the educational aspects of Nepal alongside those of different educational systems. For example, the curriculum structure can be compared with Finland, known for its innovative education system, or India, which shares historical ties with Nepal but has a different educational approach. Finally, the comparison step synthesizes the insights gained in the previous stages to identify significant patterns, differences, and similarities across the systems. This analysis can highlight how assessment techniques differ in effectiveness and how pedagogical strategies impact student learning in Nepal compared to international counterparts.

Foundations of Curriculum Development and Designing

Curriculum plan and design are formed on multiple dimensional foundations for its sustainability and practicability. Curriculum is a complex and dynamic system embedded into human constructed systems for the purpose of human well-being. Ornstein and Hunkins (2018) state four foundations, i.e., philosophical, historical, psychological, and social foundations. The curriculum development being practiced in any country relies on these foundations and the theoretical landscapes. A planned curriculum is expected to be rooted in the four foundational dimensions. The contemporary foundational concepts help one to make meaning of relevant, valid, and authentic curriculum. Curriculum conceptualization and development is a formal and conscious work of scholars, policy makers, and curriculum planners. The curriculum workers carry out curricular activities in and around the foundations of curriculum. Curriculum is a complex and comprehensive understanding. In the today's complex global, national, and local context, a single foundation, philosophy, or theory is likely less responsive to the curriculum issues.

Philosophy, in the curriculum research, implies exploring position of curriculum policy and plan developers derived from a collective thought of a nation-state and society. Philosophically, different schools of thought lead to distinct curriculum orientations. Perennialism informs curriculum developers to emphasize enduring truths, universal knowledge, and a curriculum centered on classical literature and subjects that develop intellectual and moral virtues. Likewise, essentialism focuses on transmitting essential knowledge and skills that all students need to function effectively in society. The curriculum is typically subject-centered, with a strong emphasis on basic skills and core academic disciplines. Progressivism is a philosophy for curriculum development that orients to learner-centered, experiential, and relevant to students' lives and interests. It emphasizes problem-solving, critical thinking, and social development. A Reconstructionist believes that education should be a force for social change and addressing societal problems. The curriculum is designed to empower students to analyze and transform society.

The historical foundation of curriculum refers to the influences, events, and contexts that have shaped the development of educational curricula over time. These foundations provide a lens through which to understand how curriculum has evolved to address societal needs and educational philosophies that have shaped curriculum over time.

Psychological foundation focuses on theories of learning and human development that inform curriculum design. It considers how students learn, what motivates them, and how their cognitive, emotional, and social capacities develop at different stages. A behavior theorist emphasizes observable behaviors and how learning occurs through stimulus-response associations, reinforcement, and conditioning. This often translates to curricula with clear objectives, direct instruction, and measurable outcomes. Cognitive theorist focuses on mental processes such as perception, memory, problem-solving, and information processing. This leads to curricula that emphasize understanding, critical thinking, and the development of higher-order cognitive skills. A humanist stresses the importance of individual growth, self-actualization, and

personal meaning. This perspective encourages learner-centered approaches, fostering creativity, self-direction, and a positive learning environment.

Social foundationalism explores the societal and cultural influences on curriculum. It recognizes that schools operate within a broader social context and that curriculum reflects and shapes societal values, beliefs, and needs. There is a great impact of social issues, demographic changes, economic conditions, and political ideologies on curriculum content and goals. The curriculum's responsibility is to prepare students for civic participation and addressing contemporary social challenges. Pragmatism, initiated by Dewey, is an univocally accepted educational philosophy that emphasizes experience, utility, relevance, and problem-solving as central to learning. It views knowledge as something actively constructed through engagement with the world, rather than passively received. The curriculum should be built around the direct experiences of the learners. Learning is seen as a continuous process of reconstruction of experience. Students learn best by "doing" and by engaging with real-world problems.

Hilda Taba's grass-roots approach to curriculum development begins with the diagnosis of needs, which hints at curriculum differentiation in the different countries. While this step often focuses on learner needs, Taba (1962) implicitly links these to societal needs, arguing that the curriculum must be relevant to the lives students will lead. Her model encourages a thorough analysis of the context, including the social realities, before objectives are formulated and content is selected. Goodson (1994) emphasizes the historical and social construction of school subjects and the curriculum. He argues that subjects are not natural entities but are created and re-created through social processes, political struggles, and changing societal demands.

The grand philosophies and theories have well injected the country's education, curriculum development process, and design in the modern education. In the post modernistic world, nations resisting modernist and generalist granted knowledge; and researching and restoring context situated authentic philosophies, knowledge, and skills in the school level of education. In a sum up, the dynamics that are molding the generic concept of curriculum into a nation specific contextualized form are: national aims and ideologies, cultural values and traditions, socio-economic contexts and development needs, political systems and governance, and historical legacy and educational philosophies.

National aims and ideologies influence the curriculum. Every nation's curriculum is a statement of what that society values and what kind of citizens it aims to produce. These aims are rooted in national ideologies, historical experiences, and future aspirations. For instance, Japan's curriculum has historically emphasized the development of a strong national identity, moral education, and group harmony, reflecting its cultural values and post-war reconstruction efforts. While adapting to global trends, these core values remain deeply embedded (Takei & Ninomiya, 2018). Likewise, India's curriculum frameworks for School Education consistently aim to balance universal educational goals with India's diverse linguistic, cultural, and religious landscape, while also addressing national development goals. They emphasize concepts like "rootedness in India." (National Council of Educational Research and Training [NCERT], 2023). The curriculum believed in to be shaped by cultural values and traditions. Culture profoundly

influences *what* is taught and *how* it is taught and learned. For instance, curricula in collectivist societies (e.g., many East Asian countries like China, South Korea) might emphasize collaboration, respect for elders and authority, and group achievement more heavily than those in individualistic societies (e.g., USA, parts of Western Europe), where critical individual thought and self-expression might be prioritized. (Gay, 2018)

A country develops curriculum for responding to socio-economic contexts and development needs. A country's economic stage and its development priorities heavily influence its curriculum, especially regarding vocational training and STEM education. For example, countries with strong apprenticeship traditions (like Germany's dual vocational training system) integrate vocational education deeply into their secondary school curriculum to prepare a skilled workforce. This differs significantly from countries that prioritize a more academic, university-preparatory track for all students. Likewise, developing nations often prioritize Science, Technology, Engineering, and Mathematics (STEM) in their curricula to foster innovation and economic growth, sometimes at the expense of the humanities or arts, reflecting national development plans. (Phillips & Ochs, 2004)

Curriculum goals, subjects, and contents are directly influenced by political systems and governance. The degree of centralization or decentralization in educational governance directly impacts the curriculum. For example, countries like France have a highly centralized national curriculum (Dupuy, 2020), where the Ministry of Education dictates specific content and often pedagogy across all schools, ensuring national uniformity (Broadfoot, 2000). In contrast, countries like the United States have a highly decentralized system, where curriculum decisions are primarily made at the state or even local district level, leading to significant variations even within the same country (Ornstein & Hunkins, 2018).

Historical legacy and educational philosophies of the country might have continued through the curriculum. The historical development of a nation's education system and its dominant educational philosophies leave a lasting imprint on its curriculum. For instance, many post-colonial nations still grapple with curriculum frameworks inherited from their colonial past, often leading to efforts to decolonize or indigenize their curricula to reflect local contexts and knowledge systems better. (Altbach & Mazrui, 1994). While there are some emerging global commonalities in subjects taught (e.g., Math, Science), the "what," "why," and "how" of a school curriculum are profoundly shaped by its national context. It is a dynamic curriculum document that embodies a nation's collective aspirations, cultural values, and socio-economic realities, making it inherently country-specific.

The given foundations are reflected on curriculum intents, contents, and contexts. More specifically, the foundations are the influencing factors on curriculum goals, objectives, contents, learning activities, and assessment techniques. For Zais (1976:16) as cited by Print (2020), "the components or elements included in a curriculum are (1) aims, goals and objectives; (2) subject matter or content; (3) learning activities; and (4) evaluation". The influencing factors that can be observed are reflected in the components of written or planned curriculum prepared by a curriculum development agency of a country. The curriculum foundational dimensions are

practiced differently in different socio-political contexts of the countries across the globe. This research study is aligned with an understanding of same foundations, different way of practice in different socially situated contexts. The practice reveals the country-specific art and Science adopted in the process of curriculum conceptualization and development, which makes a difference in the contents inserted into the curriculum components. In this study, the researchers have delved into exploring similarities and differences in curriculum conceptualization and preferences made in the different countries.

Curriculum Development Center ([CDC], 2076 BS) clearly states in the National Curriculum Framework about the foundations/bases of school curriculum development in the context of Nepal. The framework prescribes philosophical, sociological and cultural, psychological, political and economic (policy and governance) foundations. Philosophy provides the fundamental direction for curriculum development, shaping objectives, content, pedagogy, and assessment. In Nepal, a blend of traditional and modern philosophies influences the educational landscape. Vedic and Buddhist philosophies have a historical background in Nepali education, which emphasizes holistic development, moral values, and the pursuit of knowledge for enlightenment. This influence can be seen in the focus on human value formation and a broader understanding of human potential. Likewise, progressivism orients experiential education and child-centeredness. Being influenced by the philosophy, there's a growing shift towards learner-centered approaches, emphasizing active participation, critical thinking, problem-solving, and creativity in curriculum development and design. Though essentialism and perennialism are considered as traditional educational philosophies, curriculum developers have still given emphasis on them. The Nepal's curriculum system still retains elements of essentialism and perennialism, particularly in the emphasis on core subject matter, knowledge acquisition, and the transmission of cultural heritage.

The curriculum scholars have developed various educational philosophies and curriculum development theories. In Nepal and globally, curriculum developers work with pragmatic approach. They integrate the different philosophical and theoretical assumptions on a pragmatic ground to respond the context of a particular country. So, the curriculum developers mostly adopt eclecticism to have a philosophically synthesized approach representing contemporary and indigenous ontological, epistemological and axiological stances.

Foundations of School Curriculum Development in Nepal

Nepal's school curriculum is rooted in the sociological and cultural foundations of Nepal, which is collectively developed and fostered. The curriculum aims to be socially relevant, culturally sensitive, and inclusive, reflecting Nepal's diverse societal fabric. Cultural relevance and preservation are adopted in curriculum incorporating Nepali culture, history, and values to foster national identity and pride. This includes recognizing the diverse cultural groups and their heritage. Inclusivity and diversity are significant bases that ensure accessible and equitable for all, irrespective of caste, gender, language, region, or disability in the context of curriculum development. This aligns with the constitutional guarantee of education as a fundamental right. For responding to local knowledge and needs, an approach to local curriculum development has

been introduced allowing local governments, and even individual schools, to develop curricula tailored to specific local knowledge, skills, needs, resources, and cultural contexts. This aims to preserve indigenous knowledge and make education more relevant to local communities.

The NCF expects the curriculum would be founded on psychological theoretical foundations. Understanding how students learn and develop is crucial for designing effective curricula. The CDC aims to integrate students' needs and interests into the learning process, moving away from rote learning towards more engaging and active methods. While not always explicitly stated in policy documents, the curriculum design implicitly considers cognitive development stages, structuring content and learning experiences to be age-appropriate and progressively challenging. For skill development, there is a strong emphasis on developing 21st century skills such as critical thinking, creativity, communication, and collaboration, moving beyond mere knowledge acquisition. Holistic development of the child is an axis stance for curriculum development. This curriculum aims for the overall development of the child, encompassing cognitive, affective, and psychomotor domains.

Political and economic foundations are an integral part of Nepal's school curriculum. National policies, constitutional provisions, and economic goals significantly shape curriculum development. The National Education Policy (MOEST, 2076) is the overarching policy framework guiding education in Nepal. It outlines the vision for inclusive, equitable, and quality education, aligning with national development goals and international commitments like SDG4. The federal structure of Nepal, as enshrined in the constitution of Nepal and the Local Government Operation Act, promotes decentralization of educational governance, including curriculum development at provincial and local levels. Emphasizing the global slogan on free and compulsory education, the Constitution of Nepal (2015) guarantees free and compulsory basic education and free secondary education, impacting curriculum access and equity. For promoting technical skills, a new stream has been introduced. That is Technical and Vocational Education and Training. Through this stream, there is an increasing emphasis on integrating technical and vocational skills into the curriculum to address unemployment and meet the demands of the labor market.

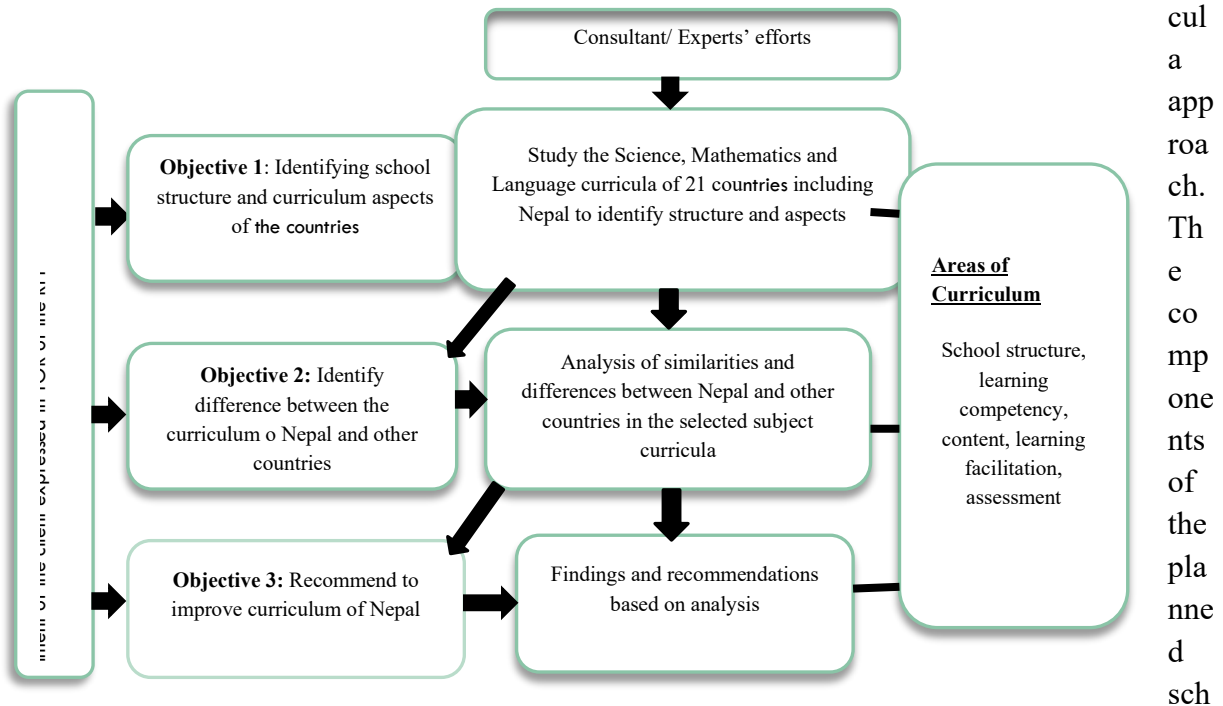
Chapter Two: Methodological Approach to the Study

Methodological approach in the research refers to the specific strategy or set of methods a researcher chooses to use for collecting and analyzing data in the study, including the theoretical framework, data collection techniques, and analysis procedures, essentially outlining the overall plan for researching to answer the specific questions. In the context of this study assignment, the technical proposal requested by the client is expected to contain methodologically three major operational components. They are: A. technical approach and methodology, B. work plan, and C. organization and staffing. These are dealt as follows:

Technical Approach and Methodology

This study is based on the cross-country comparison of the planned or official

Figure 1: Technical Layout to Understand the Research Assignment



ool curriculum, e.g. competencies, contents, learning facilitations, and assessment statements of Nepal have been compared against other countries.

Research Design

Under the qualitative approach to research, content analysis as the research design has been used in this assignment which is aligned with pragmatic stance. Pragmatic view considers usefulness of the research strategies, methods, content of the tools, information collections, and findings valued by the client and other audiences. The research assignment has been carried out using cross-country curriculum analysis which involves systematically comparing and contrasting the curriculum content, learning objectives, and pedagogical approaches across different countries.

Content analysis as the Research Design

Content analysis is used for both a method of data collection and a method of data analysis (Zhang & Wildemuth, 2009). Content analysis is one of the numerous research methods used to analyze text data (Hsieh & Shannon, 2005). It is used to explore required data from data sources like education policy and subject curricula (Science, Mathematics, and Language) of the countries representing continents in this research work. Content analysis involves a process of collecting, sorting, reviewing, coding and decoding, eliciting meaning, and extracting key ideas and categories from the documents of different forms (Bowen, 2009). Creswell's (2014) qualitative research framework offers a structured and iterative approach that is especially useful for analyzing textual or documentary data across diverse national contexts. According to Creswell, content analysis involves a systematic coding and categorizing process to identify patterns, themes, or biases within qualitative data. This begins with organizing and preparing the data, followed by a detailed reading to gain a general sense of the information. Researchers then engage in coding that refers to labeling segments of text with meaningful tags and grouping these codes into broader themes or categories. For cross-country comparisons, Creswell (2014) emphasizes the importance of maintaining contextual sensitivity, ensuring that codes and themes are not only consistent across countries but also adaptable to cultural and systemic differences. This often requires a recursive process of refining codes and themes as new insights emerge. Additionally, Creswell's "data analysis spiral" encourages researchers to move fluidly between data immersion, interpretation, and representation, allowing for a nuanced understanding of how educational policies, curricula, or governance structures vary across nations. This method is particularly effective when comparing policy documents, curricular frameworks, or stakeholder narratives, as it enables the researcher to draw both commonalities and contrasts while respecting each country's unique context.

Sampling and Sample

For this comparative study, twenty-one countries have been selected purposefully to meet study scope and objectives. It was an intentional sampling process.

Table 2 *Study Sample*

Continent	Country	Curriculum development agency	Subject Curriculum	Grade	
Asia	SAARC	Bangladesh	1	Science, Mathematics, Language	ECD-Grade 12/13
		Bhutan	1	Science, Mathematics, Language	ECD-Grade 12/13
		India	1	Science, Mathematics, Language	ECD-Grade 12/13
		Nepal	1	Science, Mathematics, Language	ECD-Grade 12/13
		Shri Lanka	1	Science, Mathematics, Language	ECD-Grade 12/13
	Other Asian Countries	China	1	Science, Mathematics, Language	ECD-Grade 12/13
		Japan	1	Science, Mathematics, Language	ECD-Grade 12/13
		Malaysia	1	Science, Mathematics, Language	ECD-Grade 12/13
		Singapore	1	Science, Mathematics, Language	ECD-Grade 12/13
		S. Korea	1	Science, Mathematics, Language	ECD-Grade 12/13
		Vietnam	1	Science, Mathematics, Language	ECD-Grade 12/13
Australia N. America	Australia	1	Science, Mathematics, Language	ECD-Grade 12/13	
	Canada	1	Science, Mathematics, Language	ECD-Grade 12/13	
	USA	1	Science, Mathematics, Language	ECD-Grade 12/13	
S. America	Brazil	1	Science, Mathematics, Language	ECD-Grade 12/13	
Europe	Finland	1	Science, Mathematics, Language	ECD-Grade 12/13	
	UK	1	Science, Mathematics, Language	ECD-Grade 12/13	
	Denmark	1	Science, Mathematics, Language	ECD-Grade 12/13	
	Germany	1	Science, Mathematics, Language	ECD-Grade 12/13	
Africa	S. Africa	1	Science, Mathematics, Language	ECD-Grade 12/13	
	Tanzania	1	Science, Mathematics, Language	ECD-Grade 12/13	

As this study has the objective of identifying school structure and curriculum aspects of the 21 different countries focusing on the similarities and differences as well as with the view to recommend measures of improving school curriculum of Nepal, a brief introduction to these countries is essential to know the bases of their curricula. This can be seen in Appendix A.

Research Instruments

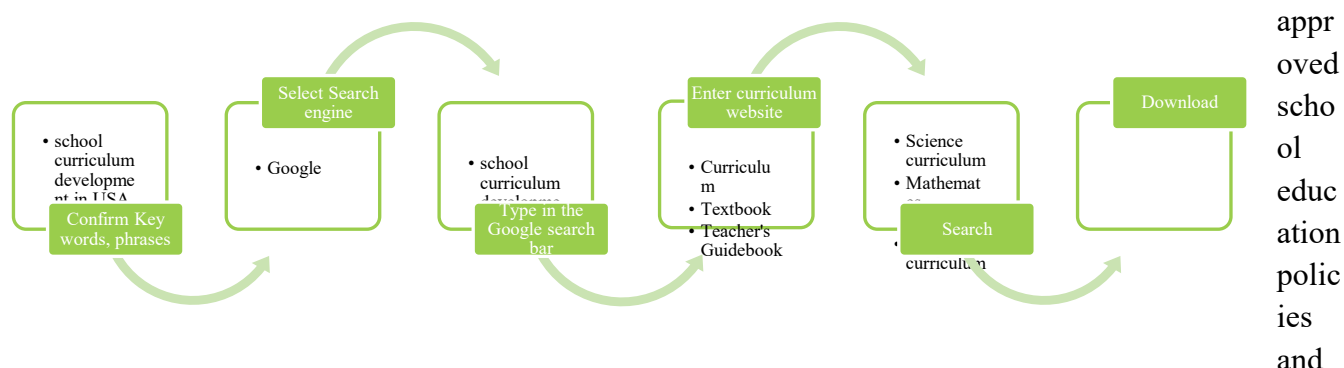
In this research, the existed documents have been studied. The data sources have been found from the Google world in the specialized website. A systematic data collection from the Google location and data extraction from the sources have been done using matrices. For the systematic collection of information through content analysis four different matrices were

formed incorporating countries, curriculum structure, competencies, level wise contents, learning facilitations, and assessment schemes (Data Collection, in Appendix B).

Process of Data Collection

The data for this research assignments are existed in already developed and formally

Figure 2 *Data Collection Process through Google Search Engine*



curriculum plans. The formally existed documents are the data sources. The researchers have played two types of roles in research process subsequently. Firstly, each of the researcher collected data sources, i.e., curricula of Science, Mathematics, and Language, from the assigned countries. Secondly, each of the researchers obtained respective curriculum and analyzed to produce interim report on the individual subject. Thus, the consultant's researchers developed and used strategies to reach to the authentic data sources by means of search engines i.e. Google search engine. Figure 2 shows the process of web-based data collection to be followed in this research.

Data Management

As the data management work in this assignment, the obtained data sources (curricula) and the data contained in the sources have been defined, documented, collected, and subsequently processed in computer system, which is an essential part of this research work. Hence, the data management and research are inextricably linked.

Framework for Comparative Analysis of Curriculum

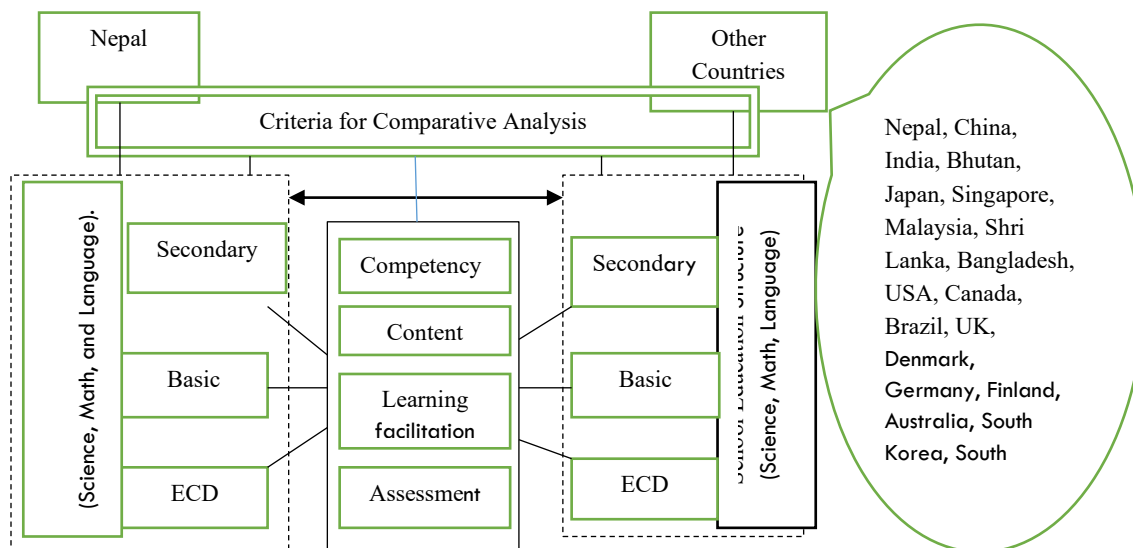
In this research, framework of comparative analysis of curriculum developed and practiced by the UNESCO International Bureau of Education (IBE) (Opertti, Kang, & Magni, 2018) has been followed. The frame will help the researchers understand the differences and similarities global trends by looking deeper and using criteria for the comparative analysis. The criteria in this comparative analysis are school structure, competency, content, learning facilitation, and assessment which are components of curriculum design.

Unit of Analysis

The unit of analysis in this assignment is curriculum area which consists of education

structure, competency, content, learning structure, learning facilitation and assessment. The

Figure 3 *Comparative Data Analysis Framework, Units, and Criteria*



client (the CDC) has already decided what content to be analyzed by the experts in assigned research work. The content being analyzed are the focus of the research objectives or general focus of research. For the data presentation and analysis, matrices have been developed for each subject and level to identify similarities and differences between the school curriculum of Nepal and other countries based on the criteria mentioned in Figure 3.

Data Analysis Matrix

In this research, content units are regarded as data. The content units in the curriculum analysis involve education/curriculum structure, learning competency, content, learning facilitation, and assessment. To observe the intersection of the content units between Nepal and selected other countries, a content analysis matrix have been devised for each sampled subject and grade.

Accuracy and Validity of Data and Data Sources

The researchers have been well aware of the accuracy and validity of data which have a direct effect on the conclusions drawn from them. By data management computer system, the reproducibility, replicability and traceability of the data collected have been assured.

Ethical Considerations in the Research

The norms developed for this study were explicitly followed in research planning and practice.

- Open communication between the client (CDC) and the service provider (MF) in the issue possibly emerge in the course of research study.

- The data and the data sources collected for the purpose of this assignment would not be exposed to unauthorized people and agency. Consultant ensured that there would not be misused of the data collected.
- The country specific legal provisions have been considered while researchers enter the authentic curriculum websites of the selected countries.
- Cyber security norms have been honored in the research process.
- It is ensured that the authenticity of the data sources has been explicitly mentioned in the research report.

Limitations

The intent of the project reflected on the research objectives was likely vague and ambitious one. It could demand an intensive and extensive effort for collecting web-based information and their analysis about the curricula for three school subjects teaching from ECED/preprimary to Grade 12/13 in twenty-one countries. Considering the weightage of the work, an expert team containing 10 members were engaged and worked collaboratively to accomplish the project activities. Some unexpected technical and practical factors like lack of the curricula (found in Dzongkha, Danish, etc.) in international language, i.e., English, unavailability of sufficient official documents, inaccessibility of the official websites of curricula locally developed for school districts like in New York State school education system, had been encountered by the researchers. These barriers in the studies were the critical considerations to accomplish project work despite the competent research team. Likewise, there are differences in school education structure between the selected countries which led this study to limit into flat levels of ECED, Primary/Elementary and Secondary only.

Chapter Three: Data Presentation and Analysis

This chapter presents the extracted data, their analysis and interpretation grouped under different themes like theoretical principles across all countries, and subject and level wise competencies, contents, facilitation processes and evaluation schemes. The curriculum structures of the selected countries are found in different in terms components. Therefore, the major themes set for comparative analysis in this study are around the components embedded officially planned school curricula of Nepal.

Comparison of Theoretical Principles of Curricula across the Countries

Every school-level curriculum is grounded on strong theoretical principles to guide what is to be taught, why it is taught, and how it is to be taught. These principles are grounded on the established theories like behaviorism, cognitivism, humanism, constructivism, etc. (Ornstein & Hunkins, 2018). Combining the essential bases, they incorporate the clear, measurable learning outcomes, teacher roles in the delivery process, and assessment styles. They also focus on how students learn at different developmental stages, performing their active roles depending on their personal self-expression, empathy and intrinsic motivation. These principles also view that learning takes place only in the active participation of the learners in the appropriately meaningful context created by the facilitator and more capable ones. These principles also incorporate social justice, cultural relevance and inclusion, and make the curriculum as a tool of transformation. Thus, the curriculum is the planned document to be implemented and evaluated in the field with the high priorities of deep engagement with different subject matters, facilitation procedures and evaluation schemes.

The school-level curricula of Nepal and other countries share several core theoretical principles which reflect unique national values and priorities. Almost all countries, including Nepal, emphasize student-centered learning, focusing on learners' interests, active participation, and practical engagement (CDC, 2079 BS). Competency-based approaches are widely adopted in nations such as India (Central Board of Secondary Education, 2025), Finland, Canada, and Australia, aligning with Nepal's focus on equipping students with real-life skills. Cultural relevance is a strong theme in Nepal, Bhutan, Vietnam, South Africa, and Brazil, where indigenous knowledge, heritage, and social values are integrated into the curriculum to ensure both local grounding and global awareness. Technological innovation and digital learning, emphasized in countries like Singapore, the USA, and Canada, are also becoming central in Nepal's efforts to modernize education through ICT tools.

Inclusivity and equity are shared goals in Nepal and other countries such as South Africa, Tanzania, and Bangladesh, where educational systems aim to reach all students regardless of background. While Nepal's curriculum includes citizenship and value education (CDC, 2079 BS), countries like Japan, China, and South Korea place a greater structural emphasis on moral education and civic responsibility. Flexibility and local adaptability are hallmarks of curricula in Denmark, Finland, and Canada, whereas Nepal's system remains more centrally guided by its National Curriculum Framework (CDC, 2079 BS). Germany and the UK lean more toward

academic rigor and subject-based instruction, while Nepal balances academic goals with practical skills and holistic development. Bhutan stands out for its unique foundation on Gross National Happiness, focusing deeply on emotional well-being and ethical values (Royal Education Council (2018), which is less pronounced in Nepal.

School-level curricula of many Asian countries such as Nepal, India, China, Bhutan, Japan, South Korea, Bangladesh, Malaysia, Singapore, and Sri Lanka tend to emphasize shared values and ethics, fostering civic responsibility, moral growth, and cultural identity. These systems prioritize competency-based learning, encouraging critical thinking, creativity, and practical problem-solving skills. While national curriculum frameworks are often centralized to maintain cohesion and standards, there is growing flexibility for schools to adapt content based on local needs and innovation. Underpinning these patterns are philosophical threads that blend collectivist ideals, a strong sense of national identity, and the integration of traditional wisdom with contemporary educational practices.

In both the United States and Canada, school-level curricula emphasize flexibility and inclusivity while promoting clear educational outcomes. In the U.S., states and districts have local autonomy but operate within federal guidelines, using backward design to structure learning around specific goals and prioritizing whole-child development through personalized and socially conscious education. Canada builds its curriculum on learner-centered and equitable principles, applying the Universal Design for learning to ensure accessibility for all students and fostering deep understanding through interdisciplinary, competency-based approaches. Together, these systems reflect a shared commitment to diversity, personalization, and purposeful learning.

Curriculum frameworks are seen to have been shaped by diverse theoretical principles reflecting each society's educational priorities. Nations like Finland, Japan, and Canada emphasize holistic and learner-centered approaches, while countries such as Singapore, Denmark, and South Korea embed competency-based models grounded in 21st-century skills. Meanwhile, Bhutan and South Africa highlight equity, well-being, and global citizenship as core tenets, integrating cultural values, environmental responsibility, and democratic engagement into curricular philosophy. This diversity sets the foundation for each unique system of learning trajectory. The table in Appendix C shows theoretical principles across the countries.

On the whole, though the school level curriculum in Nepal is dynamic and globally aligned, countries like Singapore, Australia, and Finland have more systematic integration of soft skills, lifelong learning, and community partnerships based on the constructivist learning theory and can offer potential areas of inspiration for Nepal's ongoing educational reforms.

Comparison of Level-Wise General Learning Competencies

Learning competencies are known as the integrated sets of knowledge, skills, attitudes and values to be developed in learners through educational experiences. They represent the ability to be applied in the field what the learners have internalized in them. So, the competencies include not only the contents to be learnt by heart as the knowledge with theoretical understanding of the facts and figures, concepts and information, but they also incorporate the practical abilities to perform the tasks of creativity, problem solving, communication and

information analysis. They also incorporate the dispositions or mindsets toward learning and ethics, as well as the cultural behaviors. Competencies are of different types including critical thinking, reasoning and decision making, subject specific abilities, collaboration, communication and emotional intelligence. These types also include self-awareness, self-regulation and motivation along with the understanding of social responsibilities. The learning competencies serve as minimum criteria for curriculum design, instruction and evaluation helping the designers with desired outcomes, learning path, progress evaluation and preparation of the learners for their practical life. The comparison table on general competencies across the countries is in Appendix D. Thus, achieving the set competencies indicates the student progress demonstrating the mastery of abilities.

Educational competencies in the school level curriculum in Nepal outline a holistic and future-oriented learning journey, commencing with a strong foundation in life skills, emotional well-being, communication, and creativity through engaging, hands-on, and thematic experiences. As learners progress, these competencies deepen to include ethical reasoning, civic consciousness, and technological fluency, aiming to cultivate respect for both traditional values and modern innovation, preparing students to navigate an increasingly intricate world.

Early Childhood Development and Education (ECDE) is the foundational Phase of holistic nurturing of children from around age three to 6 years in the Nepali curriculum development context (CDC, 2079 BS). It focuses on the children's physical, cognitive, emotional, social, and language development to shape their lifelong learning, behavior, and well-being in the future. It has incorporated two key aspects of early childhood development and education. The first refers to the biological and physical growth in children, and the second refers to the structured learning experiences. The physical aspect requires proper nutrition, immunization, and healthcare, whereas the cognitive aspect (learning experiences) requires the activities to stimulate thinking, problem-solving, and effective communication. Effective communication can take place through encouraging verbal and non-verbal expression with the help of storytelling, songs and conservation. The children of the age of 3 years to 6 years need to build empathy, co-operation and self-regulation and develop gross motor abilities through movement and hands-on activities. Thus, ECDE is not just about preparing children for school, but also about nurturing their whole lives.

General Competencies for Pre-primary Level across Countries

Across the 21 countries studied, there is a strong convergence in emphasizing holistic development during the pre-primary years. Most systems intentionally support children's physical, emotional, cognitive, and social growth in an integrated manner. Language and communication development, particularly in home and national languages, are consistently prioritized, alongside early numeracy, logical thinking, and opportunities to explore patterns and symbols. Play-based, experiential learning forms the foundation of pedagogical approaches, engaging children through exploration, creativity, and thematic discovery. In addition, social-emotional skills such as self-regulation, empathy, and cooperation are widely fostered, helping children build moral understanding and respectful peer relationships. Music, movement, art, and

imagination are central to cultivating creative expression. Physical development is encouraged through motor skill enhancement, hygiene, and health habits. A shared focus also emerges on introducing values education early, nurturing civic awareness, respect for diversity, and environmental responsibility across diverse cultural settings.

Across the 21 countries studied, including Brazil, South Africa, Finland, Japan, Denmark, Australia, and Nepal, there is strong alignment in promoting holistic development during the pre-primary years. Most systems intentionally support children's physical, emotional, cognitive, and social growth in an integrated manner. Whether in Nepali in Nepal Mandarin-speaking China, language and communication are prioritized as foundational. Similarly, early numeracy and logical thinking appear across frameworks from Singapore to Bhutan. Play-based and experiential learning forms the pedagogical backbone in nations like Bangladesh, and the United Kingdom, fostering children's curiosity and active engagement.

Beyond foundational skills, countries such as the UK, South Korea, and Finland emphasize social-emotional development, including self-regulation, empathy, and cooperation. Creative expression through art, music, and storytelling is promoted across settings from Canada to Bhutan. Likewise, physical coordination, health habits, and well-being are common priorities, seen in curricula from Singapore to India. Finally, nearly all countries integrate aspects of citizenship and values education, embedding respect for diversity, sustainability, and community responsibility from an early age. Appendix D shows the comparison in a table form.

General Competencies for Basic Level across the Countries

Across countries such as Nepal, India, Bhutan, Bangladesh, and Sri Lanka, as well as China, Malaysia, Singapore, and Vietnam, there is a strong shared emphasis on integrating patriotism, national identity, and civic values into foundational learning. These systems prioritize language development, often in home languages, while also encouraging digital literacy, logical reasoning, and inquiry-based Science and math education. Similarly, Finland, Denmark, Germany, and the UK emphasize holistic development through values-based education, democratic learning environments, and real-world application of knowledge. Countries like South Korea, Japan, and Australia demonstrate a well-structured and sequenced approach to learning, focusing on academic depth while nurturing student agency and cultural awareness.

At the early childhood and primary levels, countries such as South Africa, Brazil, and Tanzania highlight inclusive education as a tool to address social inequities, with strong community involvement in foundational learning. They promote emotional development, health and hygiene habits, and values education from the start. Meanwhile, systems in Canada and the USA tend to incorporate competency-based education, focusing on self-directed learning, creativity, and real-world problem-solving across disciplines. Across all countries, there is recognition of the need for learners to develop self-regulation, curiosity, social cooperation, and foundational literacy and numeracy.

A growing number of countries, such as Nepal, Finland, South Africa, Australia, and Singapore, support the integration of digital tools for learning, while embedding ethical use and responsible online behavior. Countries like Japan, Bhutan, and Germany further stand out for

emphasizing well-being, environmental sustainability, and metacognitive thinking, aligning learning to global citizenship and sustainable development. Conversely, while India, Bangladesh, and Tanzania are expanding digital access, the role of technology in primary education remains in development, often shaped by infrastructure and equity challenges.

Despite contextual diversity, a common trend is the shift from content-heavy curricula to learner-centered, interdisciplinary learning. From Bhutan's Gross National Happiness philosophy to Canada's focus on equity and well-being, education systems are recognizing that life skills, empathy, creativity, and civic responsibility are as essential as academic achievement. Whether through localized governance in Nepal and the USA or national frameworks in China and the UK, countries are increasingly aligning education with broader developmental goals, encouraging learners to thrive both personally and as responsible global citizens. The comparison is in the table, Appendix E.

Secondary Level General Competencies across the Countries

Nepal shares many core educational competencies (CDC, 2078) with other nations, including a widespread emphasis on holistic development, critical thinking, digital literacy, and civic responsibility, evident in frameworks from India, China, Japan, and European countries like Finland and Germany. However, Nepal's framework is notably distinguished by its explicit and consistent emphasis on sustainability as a core competency throughout the educational continuum. Furthermore, its unique commitment to balancing "respect for both tradition and modern innovation" sets it apart, reflecting a deliberate effort to integrate cultural heritage with forward-looking development. The specific mention of a "strong foundation in life skills" from the earliest stages and the explicit aim of developing "compassionate citizens" also provide distinct nuances compared to the broader statements on similar domains found in other countries' competency descriptions.

Level-wise competencies reveal some convergence and key contrasts. At the primary level, literacy, numeracy, and foundational scientific inquiry are near-universal, while secondary stages show increased attention to research skills, civic values, and technological fluency. Countries like India, the USA, and Germany emphasize STEM proficiencies, whereas Bhutan, Brazil, and Tanzania balance them with life skills, arts, and moral reasoning. Instructional design varies from Nepal's traditional teacher-led methods to Denmark's collaborative outdoor learning (Ministry of Children and Education, 2020) and Malaysia's digital facilitation (Ministry of Education Malaysia, 2023), with countries increasingly blending classroom and experiential learning models for deeper engagement.

In South and East Asia, countries like Nepal, India, Bhutan, China, and Bangladesh structure secondary education around competency-based learning, integrating national priorities such as civic responsibility, sustainable development, and moral education (Directorate of Primary Education, 2015). The table in Appendix F shows the comparison. Nepal and Bhutan emphasize holistic development aligned with social values, while India and China incorporate critical thinking and interdisciplinary projects. Bangladesh has recently modernized its

framework to include wellbeing and alignment with global goals like the SDGs (Directorate of Primary Education, 2017).

In advanced Asian systems such as Japan, Singapore, Malaysia, and Sri Lanka, secondary curricula prioritize soft skills including global awareness, emotional intelligence, and digital fluency. Japan focuses on lifelong learning and inquiry-based methods, while Singapore embeds values and character education throughout subjects. Malaysia and Sri Lanka encourage creativity, ethical reasoning, and inclusive citizenship, supported by flexible learning pathways and tiered competency models (National Education Commission, 2014).

Across the Americas, USA, Canada, and Brazil emphasize student agency, social-emotional learning, and practical skill-building. The U.S. uses frameworks like CASEL and Common Core to support mastery-based progress and real-world application. Canada promotes personal growth and communication through self-assessment and adaptable provincial curricula. Brazil's BNCC sets nationwide competencies that embed civic engagement and digital literacy, with a strong emphasis on equity and lifelong learning.

European countries and Australia, including UK, Denmark, Germany, Finland, and Australia, typically integrate cross-curricular competencies such as ethics, civic responsibility, and creativity. These systems support student autonomy through project-based learning and clear progression benchmarks. Finland and Germany blend academic and vocational pathways, while Australia defines general capabilities across subjects to ensure coherent development. Each country aligns competencies with national values, encouraging both personal and social growth.

The school level curriculum of Nepal highly emphasizes foundational literacy, numeracy, and values integrating soft skills, (CDC, 2076 BS, CDC, 2077 BS, CDC, and 2078 BS). This gap may limit learners' preparedness for complex, modern challenges and reduce their adaptability to fast-evolving contexts. Like many global counterparts, the educational competencies are structured but there is weak coherent learning progression across grades, especially at key transition points (e.g., Grades 3–4, 8–9, 10–11), ensuring foundational skills are built upon across educational stages to foster well-rounded individuals.

Comparison of School Structure across the Countries

School structure refers to the organizational frameworks system and relationships that design the way of how a school functions as an environment for teaching and learning. This school structure is not only the physical and administrative, but it can have the great influence on the educational experience from curriculum delivery to student engagement and staff management, based on the school structures, the school leadership, staff for both teaching and non-teaching performance along with school governance are organized. Academically, the school structure organizes grade levels, subject areas, curriculum as well as the assessment system. Thus, we can say that school structure is the frame to manage the educational activities in the field.

Table 1: School structure across all countries

Country	Level	Grades	Ages	Cr. Hrs.	Yearly Hrs.
Nepal	ECD	–	4 yrs (3–5 yr)	–	516
	Basic	1–8	5–12 years	26–32	832–1024
	Secondary	9–12	13–16 years	32	1024
India	ECD (ECCE)	Pre-K–1	3–6 years	–	800
	Basic	Grades 1–8	6–14 years	30	1,000
	Secondary	Grades 9–12	14–18 years	30	1,000
Bhutan	ECD (ECCD)	Pre–1	3–6 years	–	800
	Basic	Grades 1–8	6–14 years	25	900
	Secondary	Grades 9–12	14–18 years	25	900
Bangladesh	ECD	Pre-primary	4–6 years	–	800
	Basic	Grades 1–8	6–14 years	30	1,000
	Secondary	Grades 9–12	14–18 years	30	1,000
Sri Lanka	ECD	Pre-school	3–5 years	–	800
	Basic	Grades 1–8	5–13 years	30	1,000
	Secondary	Grades 9–13	14–18 years	30	1,000
China	ECD	KG (3 levels)	3–6 years	–	800–1000
	Basic	Grades 1–9	6–15 years	25	1,200
	Secondary	Grades 10–12	15–18 years	25–30	1,200
Japan	ECD	KG	3–6 years	–	800
	Basic	Grades 1–9	6–15 years	30	1,200
	Secondary	Grades 10–12	15–18 years	30	1,200
Vietnam	ECD	Pre-primary	3–6 years	–	800
	Basic	Grades 1–9	6–15 years	25	1,000
	Secondary	Grades 10–12	15–18 years	25	1,000
Singapore	ECD	Pre-K	4–6 years	–	800–900
	Basic	Grades 1–10	6–16 years	30	1,000
	Secondary	Grades 11–12	17–18 years	30	1,000
Malaysia	ECD	Pre-K/KG	4–6 years	–	800
	Basic	Grades 1–6	7–12 years	25	900
	Secondary	Grades 7–12	13–17 years	25	900
S. Korea	ECD	KG	3–5 years	–	1,000
	Basic	Grades 1–9	6–15 years	35	1,680
	Secondary	Grades 10–12	16–18 years	35	1,680
UK	ECD (ECCE)	Nursery–Rec	3–5 years	–	800–900
	Basic	Years 1–9	5–14 years	25	960
	Secondary	Years 10–13	15–18 years	25–30	960–1,000
Denmark	ECD	Pre-school	3–6 years	–	800
	Basic	Grades 1–9	6–15 years	27	900
	Secondary	Grades 10–12	16–19 years	27	900
Germany	ECD	Kindergarten	3–6 years	–	800
	Basic	Grades 1–9	6–15 years	23–27	800–1,000
	Secondary	Grades 10–12/13	16–18/19 years	23–27	800–1,000
Finland	ECD	Pre-primary	6 years	–	700
	Basic	Grades 1–9	7–16 years	20–25	800
	Secondary	Grades 10–12	17–19 years	20–25	800
Tanzania	ECD	Pre-school	5–6 years	–	800
	Basic	Grades 1–7	7–13 years	25	900
	Secondary	Forms 1–6	14–18 years	25	900
S. Africa	ECD	Grade R	5–6 years	–	800–850
	Basic	Grades 1–9	6–15 years	25	900–950
	Secondary	Grades 10–12	16–18 years	25	900–950
Brazil	ECD	Pre-school	4–6 years	–	800
	Basic	Grades 1–9	6–14 years	20–25	800
	Secondary	Grades 10–12	15–17 years	20–25	800
USA	ECD	PreK–K	4–6 years	–	900
	Basic	Grades 1–8	6–14 years	30	1,000

Canada	Secondary	Grades 9–12	14–18 years	30	1,000
	ECD	PreK–K	4–6 years	–	850
	Basic	Grades 1–8	6–14 years	25	950–1,000
Australia	Secondary	Grades 9–12	15–18 years	25	950–1,000
	ECD	K (Foundation)	5–6 years	–	800
	Basic	Years 1–6	6–12 years	25	900
	Secondary	Years 7–12	13–18 years	25	900

The school structures across these countries reflect a blend of cultural values, policy priorities, and developmental goals. In South Asia, countries like Nepal, India, Bhutan, Bangladesh, except Sri Lanka, follow a broadly similar 10+2 structure, with pre-primary, primary (Grades 1–5), lower secondary (6–8), upper secondary (9–10), and higher secondary (11–12) stages. These systems emphasize foundational literacy and numeracy, with increasing focus on civic values, vocational skills, and national identity. China, Japan, Vietnam, Singapore, Malaysia, and South Korea adopt structured models such as 6-3-3 or 6-4-2, with strong central oversight and high academic expectations. These systems are known for rigorous curricula, early tracking, and integration of Science, Technology, Engineering, and Mathematics (STEM) and moral education, often supported by national assessments and competitive entrance exams.

In contrast, Western and Nordic countries like the UK, Denmark, Germany, Finland, Canada, the USA, and Australia offer more flexible and inclusive structures. The UK follows a key stage model with national assessments, while Germany uses a tracked system post-primary, directing student into academic or vocational streams (Dupuy, 2020, European Commission, 2025). Finland and Denmark prioritize equity, student well-being, and holistic development, with delayed formal assessments and strong teacher autonomy. Canada and the USA operate decentralized systems where curriculum and school structures vary by province or state, but generally follow a K–12 model with emphasis on local control and standards-based learning. Australia blends national curriculum frameworks with state-level implementation, supporting diverse learning pathways and cross-disciplinary competencies. In Tanzania, South Africa, and Brazil, school structures are shaped by post-colonial reforms, aiming to expand access, integrate life skills, and address social inequalities through phased primary, secondary, and vocational education systems.

Subject wise Comparison Across the Countries

This subsection deals with the curricula data derived from the selected countries subject wisely. The analysis under each subject contains the curriculum components i.e., competencies, contents, learning facilitations, and assessment approaches.

Analysis of Mathematics Subject Curriculum Across the Countries

Mathematics as a compulsory subject has been included in school level curriculum to sharpen logical thinking and problem-solving skills essential for everyday decision-making in learners. It is foundational for understanding Science, Technology, and economics, empowering students in multiple fields. It equips them with practical life skills like budgeting, measuring, and

interpreting data. Compulsory math ensures equal access to intellectual tools, fostering fairness and lifelong learning.

Competencies in Mathematics curricula across the countries. The analyzed information indicates that Nepal's Mathematics competencies for Basic and Secondary levels focus on developing practical knowledge and skills in arithmetic, geometry, measurement, statistics, and algebra. The curriculum emphasizes the use of both traditional and modern numbering systems, problem-solving in daily life, and the application of mathematical thinking.

Across sampled countries, several common threads in Mathematics education emerge. All countries, including India, Bhutan, Bangladesh, Sri Lanka, China, Japan, Vietnam, Singapore, Malaysia, S. Korea, UK, Denmark, Germany, Finland, Tanzania, South Africa, Brazil, USA, Canada, and Australia, prioritize foundational numeracy and geometric understanding at the Basic level, focusing on number sense, shape recognition, and solving everyday problems. As learners progress to the Secondary level, there is a universal shift towards more complex mathematical domains such as algebra, geometry, statistics, and probability, with an emphasis on analytical thinking, interpreting data, and solving advanced problems.

At the basic level, countries like Nepal, China, India, Bhutan, and Sri Lanka introduce math through basic arithmetic, shapes, measurements, and patterns. Nations such as Singapore and Finland use innovative methods like Singapore's Concrete-Pictorial-Abstract model or Finland's emphasis on conceptual understanding. In Western countries like the USA, Canada, and the UK, foundational skills include number sense, operations, and spatial reasoning, often supported by inquiry and problem-solving strategies. In the lower secondary phase, most countries introduce algebra, geometry, statistics, and data handling. South Korea, Denmark, and Germany emphasize structured problem-solving and modeling, while Brazil and South Africa incorporate math into practical and civic contexts. Japan and Malaysia deepen algebraic and spatial concepts, while Bangladesh and Tanzania use competency-based approaches to support students through structured progressions. At the upper secondary level, curricula become more specialized and rigorous, with advanced topics like calculus, trigonometry, and mathematical reasoning. Countries like Australia, Singapore, and India offer elective tracks based on students' academic goals. Others, such as Germany and South Africa, differentiate between general and advanced streams. The focus shifts toward preparing students for tertiary education or professional applications, with a strong emphasis on logic, modeling, and analytical thinking. A table for comparison is given in Appendix G.

Despite the broad similarities, notable differences exist in the specific emphasis and structure of Mathematics education. While Nepal explicitly details competencies around local numbering systems and the development of "mathematical knowledge, skills, thinking and attitude and application in daily life" at the basic level (CDC, 2076 BS, CDC, 2077 BS, CDC, 2078 BS), other countries generally focus on standard global mathematical concepts.

Contents in the Curricula of Mathematics Subject Across all Countries. Mathematics education across countries begins with foundational skills such as numbers, operations, shapes, and measurements in the primary grades, gradually introducing more abstract concepts like fractions, geometry, data handling, and algebra in middle school. As students' progress to lower and upper secondary levels, curricula expand to include trigonometry, statistics, probability, and calculus, with countries like Nepal, China, India, Bhutan, Japan, and Singapore offering structured transitions into advanced topics such as matrices, vectors, and mathematical modeling. Nations differ in sequencing and emphasis, some adopting spiral, strand-based, or competency-driven approaches. They collectively aim to foster logical thinking, analytical problem-solving, and real-world application, aligning with international standards to prepare learners for higher education and technical careers.

It highlights a clear global trend in Mathematics curriculum design: beginning with basic numeracy, shapes, and measurements in primary grades, then transitioning into algebra, geometry, statistics, and probability during lower secondary levels. Countries like the UK, Denmark, and Germany establish foundational math skills early on and progressively introduce abstract concepts and real-life applications in upper stages, with Germany's federal structure allowing for regional adaptation within a nationally guided framework (Secretariat of the Standing Conference of Ministers of Education and Cultural Affairs of the Lander in the Federal Republic of Germany, 2019). In contrast, systems like Finland, Australia, South Korea, South Africa, and Tanzania tend to embed Mathematics within broader themes like inquiry, sustainability, or practical problem-solving. Finland emphasizes student agency and integrates math into environmental studies early on. Australia's strand-based model ensures consistent development across core domains, while South Korea and Tanzania use math to support scientific reasoning and national development. These diverse approaches reflect how countries balance foundational math skills with competencies that foster innovation, equity, and lifelong learning. The table given in Appendix H compares it.

Across countries like Nepal, India, Bangladesh, Bhutan, and Sri Lanka, the primary and lower secondary Mathematics curricula emphasize number sense, basic operations, measurement, geometry, and introductory data handling. As learners progress, they encounter algebraic thinking, geometry, probability, and statistics, often through competency-based frameworks designed to connect Mathematics with real-life applications and national development goals. In East and Southeast Asia, China, Japan, South Korea, Singapore, Malaysia, the progression includes rigorous foundations in arithmetic, spatial reasoning, and geometry, with increasing emphasis on algebra, modeling, trigonometry, and metacognition by lower secondary levels. These systems often stress mathematical reasoning, creativity, and computational fluency, supported by structured national curricula and performance benchmarks. Western and Southern nations such as the USA, Canada, Brazil, the UK, Germany, Denmark, Finland, Australia, South Africa, and Tanzania provide a similar progression but frequently embed cross-curricular competencies and proficiencies like fluency, reasoning, and communication. Their curricula favor student agency and differentiated pacing, while integrating

ICT, problem-solving, and conceptual understanding to support both mathematical literacy and future readiness. Nepal's curriculum structure closely mirrors international progression, from numeracy and geometry in early grades to algebra, trigonometry, and probability in secondary levels. This is consistent with systems in India, Tanzania, Sri Lanka, and Bangladesh, where math content is sequenced to gradually build complexity.

However, countries like Australia, Finland, and the UK use strand-based or key-stage models, which offer greater clarity in skill development across themes like number and algebra, measurement and geometry, and statistics. The school-level mathematics curriculum appears to be weak in adopting a strand or phase-based framework to scaffold better learning and make content transitions more coherent. Similarly, Nepal covers a broad range of topics; its curriculum could deepen its focus on mathematical reasoning, problem-solving, and modeling, a core emphasis in systems like those in South Korea, Germany, and Singapore. These countries integrate analytical thinking and real-world applications across levels, often linking math to scientific inquiry or technology. Additionally, nations such as South Africa and Brazil embed Mathematics within civic contexts and development themes, helping learners connect abstract skills to everyday situations. Nepal can strengthen its impact by explicitly incorporating mathematical literacy into broader social, environmental, or entrepreneurial competencies.

Nepal follows a grade-wise structure, from basic arithmetic and geometry in primary school to algebra, trigonometry, and statistics in secondary levels (CDC, 2076 BS, CDC, 2077 BS, CDC, 2078 BS, CDC, 2078 BS). This mirrors progression in countries like India, Sri Lanka, Bangladesh, and Tanzania. However, systems in Australia, the UK, and Singapore often organize content into thematic strands (e.g., number and algebra, measurement and geometry, statistics and probability), which allows clearer scaffolding across grades. Adopting a strand-based structure in Nepal could enhance coherence and flexibility, helping teachers and students better track skill development. Nepal's curriculum includes strong content coverage, but could deepen its emphasis on problem-solving, reasoning, and modeling, skills prioritized in countries like Finland, South Korea, and Germany. These nations link math learning with inquiry, critical thinking, and real-life applications.

Learning Facilitations in Mathematics Curriculum across the Countries. The facilitation process varies depending on the national priorities and educational philosophies. For instance, Bhutan emphasizes local context and holistic play-based learning (Royal Government of Bhutan, Ministry of Education, 2022), while Japan uses lesson study and collaborative planning. Finland avoids heavy textbook use and focuses on collaborative design tasks (Mykrä, 2023), whereas China and Vietnam follow a more structured, textbook-driven method. Some countries, such as Denmark and Australia, also emphasize outdoor learning, which is less common in South Asian systems like Nepal and Bangladesh.

Assessment System in Mathematics Curriculum across Countries. Assessment methods across these countries generally combine periodic tests, classroom exercises, and standardized external examinations to gauge student understanding and skill development. Assessment methods broadly include a combination of oral and written tasks, classroom

exercises, and standardized examinations to evaluate student progress and proficiency. Almost all countries implement a mix of formative and summative assessments, combining teacher observations, class tests, and project work. Countries such as Nepal, the UK, and Singapore utilize portfolio-based evaluations and ongoing classroom participation checks. National-level examinations at the end of the basic and secondary levels are also widely used, such as the PSLE in Singapore, the Gaokao in China, or the SSC in Bangladesh. Peer and self-evaluation practices are encouraged in several systems, such as South Africa and Bhutan.

Assessment systems differ in structure and intensity. For example, countries like China and South Korea use high-stakes national exams such as Gaokao and CSAT, while Finland follows low-stakes sample assessments. Nepal uses a mixed approach with both internal and external assessments and a strong emphasis on portfolio and classroom participation. In contrast, the USA and Canada rely heavily on statewide or provincial standardized testing, and countries like Bhutan and Denmark prefer formative, school-based assessments over centralized exams. Additionally, CPA (Concrete–Pictorial–Abstract) method used in Singapore or South Africa’s domain-based approach integrates hands-on learning with conceptual depth. Nepal is weak in availing the benefits of embedding such pedagogical strategies to improve understanding and retention, especially among diverse learners.

Across most countries, Mathematics evaluation at the basic level focuses on building foundational skills through a mix of formative and summative assessments. These include oral questioning, worksheets, short written tests, and practical problem-solving activities. Countries such as Nepal, India, Bhutan, and Bangladesh emphasize continuous or competency-based evaluations, utilizing classroom observations and structured tasks. Systems such as Singapore, Japan, and Malaysia blend conceptual understanding with structured testing. Western models, such as those in the USA, Canada, the UK, and Finland, support inquiry and reasoning, often aligning assessments with national or state curricula. Formative feedback, diagnostic testing, and performance-based evaluations are common, helping students progress through stages of arithmetic, geometry, and introductory algebra.

At the upper secondary level, most countries shift toward formal assessments linked to national exams or university entrance requirements. Nepal, India, Sri Lanka, and Bangladesh use board examinations that combine theoretical and practical elements. Singapore, South Korea, and Australia offer differentiated math tracks assessed through rigorous national exams. Countries like the UK (GCSE and A-levels), Germany (Abitur), and Brazil (ENEM) evaluate complex mathematical thinking, including calculus, statistics, and modeling. South Africa and Tanzania integrate continuous assessment with final exams to measure applied math skills and reasoning. These methods reflect a global trend toward combining analytical depth, problem-solving, and real-world relevance in upper-level Mathematics education.

Analysis of Science Subject Curriculum across the Countries

Science is included in the school-level curriculum as a compulsory subject to nurture curiosity and help students explore the natural and physical world around them. Scientific thinking builds observation, experimentation, and reasoning skills. It develops awareness of

health, environment, and sustainability which is crucial for responsible citizenship. Science supports innovation and prepares students for careers in Technology, engineering, and medicine. So, learning Science promotes critical thinking and helps students make informed life choices.

Competencies in Science curricula across the countries. Nepal's Basic and Secondary level competencies in Science and Technology focus on developing a foundational understanding of the natural world, scientific inquiry skills, and the practical application of knowledge. The curriculum emphasizes awareness of environmental cleanliness, health, and the interrelationship between biodiversity and the environment, alongside creative expression through arts and technology.

A strong commonality across Nepal and most other listed countries is the universal emphasis on scientific inquiry and observation from the Basic level, encouraging learners to explore the natural world, identify patterns, and ask questions (e.g., India's "exploring natural world," Bhutan's "observing changes," China's "asking questions about nature"). All countries broadly cover core scientific content areas such as environment, living things (biology), matter (chemistry), and energy/force (physics) across both Basic and Secondary levels. The transition to Secondary education universally involves a deeper dive into specialized scientific disciplines (e.g., Physics, Chemistry, Biology) and the development of more complex skills like performing experiments, analyzing data, forming hypotheses, and applying scientific concepts to real-world issues.

Science education across Nepal, China, and India begins with foundational skills like observation and classification, gradually transitioning to structured inquiry and deeper exploration of physical, biological, and environmental concepts. Secondary levels focus on scientific methods, hypothesis testing, and experimentation, with curriculum reforms promoting real-world relevance and civic engagement. Nepal emphasizes sustainability and responsibility, China integrates STEM with societal needs, and India reinforces inquiry-based learning under the NEP 2023 framework.

In Bhutan and Japan, Science learning is deeply connected to cultural and emotional development. Bhutan's curriculum fosters curiosity and environmental awareness, ultimately leading to subject-specific analysis in secondary school, aligned with Gross National Happiness (Royal Government of Bhutan, Ministry of Education, 2025). Japan promotes creativity and scientific reasoning through structured competencies, beginning with natural observation in primary grades and advancing to modeling and societal application in higher grades. Singapore and Malaysia also emphasize inquiry-driven approaches (Curriculum Planning and Development Division, [CPDD], 2022), where students move from observing diversity and interactions in nature to tackling ethical and conceptual models, with a strong focus on scientific literacy and global preparedness. The similarities and differences in terms of competencies are given in Appendix I.

Contents in Science Curricula across the Countries. Based on the Science contents mentioned in the table given in the Appendix J, it can be seen that Nepal's school Science curriculum shares many similarities with global models in terms of content progression and

foundational focus. Like other countries, it begins with basic understanding of living and non-living things, the human body, weather, and health at the primary level. It advances through physical, biological, and Earth Sciences in lower secondary, culminating in specialized topics such as mechanics, chemical reactions, and environmental Science in upper grades. However, while this structure is clear, Nepal's curriculum could benefit from deeper integration of transversal competencies, such as inquiry skills, ethical reasoning, and sustainability, which are emphasized in places like Finland, Australia, and South Korea.

In the basic grades, most countries introduce Science in an integrated or environmental format. Nepal begins Science instruction from Grade 4 with a focus on health and nature, while countries like China, Malaysia, and the USA start as early as Grade 1 or Kindergarten, emphasizing observation, inquiry, and simple experiments. Finland and Germany integrate Science into broader subjects like Environmental Studies promoting cross-disciplinary thinking. Singapore and Japan introduce Science from Grade 3, focusing on diversity, systems, and real-world relevance through hands-on activities (CPDD, 2022). During lower secondary education, nearly all systems shift toward formal Science instruction with separate topics such as physics, chemistry, and biology. Nepal, Bhutan, and Bangladesh transition from integrated models to specific subjects around Grades 6–9, embedding practical work and scientific reasoning. Countries like India and South Africa follow a composite approach before specialization begins, while others like Denmark, South Korea, and Brazil structure learning around experimentation, problem-solving, and thematic depth, often guided by national standards or competency frameworks. A table given in Appendix J compares cross-country contents in the subject.

Learning Facilitation in Science Curricula in the Countries. Countries like Sri Lanka, Bangladesh, the United States, Canada, and many across Europe and Africa also follow structured progressions. Early grades focus on observation and classification, while later stages introduce biology, chemistry, physics, and scientific reasoning. Curricula often include modeling, problem-solving, and communication skills, emphasizing equity, autonomy, and the societal impact of science. Australia and South Korea offer unique strands and inquiry-based models, while South Africa and Tanzania promote hands-on learning and environmental awareness to develop scientific literacy, supporting national development.

Nepal and Tanzania both follow a grade-wise progression, introducing basic Science concepts like observation and classification in early grades, and expanding to biology, physics, and chemistry in lower secondary levels. Australia uses a strand-based structure (understanding, inquiry, human endeavour), while South Korea introduces formal Science from Grade 3 with increasing subject-specific depth. Nepal could adopt Australia's strand model to strengthen clarity and thematic cohesion across grades. Nepal emphasizes inquiry, experimentation, and environmental awareness, similar to South Korea's focus on creativity and collaboration, and South Africa's integration of investigation and communication skills. However, Australia and South Africa embed Science as a social and ethical pursuit, which helps students connect Science to human contexts. Nepal may benefit from more explicit inclusion of ethical reasoning and

Science-society links to enrich its competencies. Nepal, Tanzania, and South Africa prioritize real-life applications and environmental relevance in their curricula.

Across Asia, Science education typically begins with integrated themes such as living and non-living things, health, weather, and basic physical principles. As learners advance to lower secondary, the curriculum transitions into core subjects like physics, chemistry, and biology, emphasizing inquiry skills, ecological understanding, and health awareness. By upper secondary, many countries offer specialized Science streams that strengthen practical skills, experimental learning, and environmental relevance. Countries like Nepal tie Science to civic responsibility, Bhutan aligns it with emotional development, while nations like Japan, Singapore, and Malaysia promote creativity, modeling, and ethics in scientific literacy.

In the Americas, Europe, Oceania, and Africa, Science education follows a similar progression. The United States, Canada, and Brazil introduce life, Earth, and physical Sciences through hands-on inquiry, evolving into deeper topics like chemical reactions, cell biology, and astronomical systems by lower secondary. European systems emphasize observation and analytical thinking early on, with ethical reasoning and sustainability incorporated in senior years. Meanwhile, countries such as Australia, South Africa, and Tanzania integrate biology, chemistry, physics, and Earth Sciences in early grades, with critical thinking, problem-solving, and technological literacy emphasized as students' progress toward tertiary and civic readiness.

Assessment System in Science Curriculum across the Countries. South Korea adds rigor through performance-based learning and national assessments. Australia fosters student curiosity with flexible, inquiry-driven evaluation. Nepal's continuous assessment system could be enhanced by incorporating more formative feedback and emphasizing soft skills like digital literacy and sustainability, features found in Australian and Korean models.

In lower and upper secondary grades, assessments become more structured and subject-specific. Most systems introduce practical lab work and written exams to evaluate understanding in physics, chemistry, and biology. Nepal and South Africa combine internal continuous assessment with external board exams, while South Korea and Japan include performance tasks, experiments, and even research reports. Australia, Singapore, and the UK evaluate scientific reasoning through national exams and practical endorsements, and Brazil and Tanzania emphasize modeling and real-life problem-solving. By Grade 10 or higher, nearly all countries align Science evaluation with formal curricula and national standards, often blending theoretical knowledge with applied skills to support students' readiness for higher education and real-world challenges.

To strengthen its alignment globally, Nepal might also consider diversifying assessment approaches and embedding Science within broader societal and developmental contexts. Countries like Canada and the USA focus heavily on inquiry-based, cross-disciplinary learning and link Science content to problem-solving and civic engagement. Meanwhile, nations like South Africa and Tanzania incorporate themes of environmental awareness and real-life applications to support national development. By adopting a more competency-driven and

socially grounded Science curriculum, Nepal can better prepare students for both global citizenship and local innovation.

Across most countries, Science evaluation begins in primary school with informal methods like observation, oral questioning, activity-based learning, and class projects. Nepal, India, Bhutan, and Bangladesh rely on continuous or competency-based assessment systems, using tools such as worksheets, experiments, and group work. Japan and Singapore assess students' curiosity and inquiry skills early on, while Malaysia, China, and Sri Lanka blend formative assessments with structured classroom tasks. In countries like the USA, UK, and Canada, national or provincial frameworks guide the use of inquiry, data analysis, and hands-on investigations. Finland, Germany, and Denmark incorporate environmental studies, emphasizing observation and communication alongside basic written assessments.

Analysis of Language Subject Curricula across Countries

This analysis provides a comparative overview of Second Language (L2) education, primarily English, across various countries, examining curriculum design from Basic to Secondary levels. It highlights the universal objective of developing core linguistic competencies in listening, speaking, reading, and writing for practical communication. While foundational grammar and vocabulary are consistently emphasized, distinctions arise in thematic content, instructional methodologies, and assessment approaches. This comparative study illuminates both shared global trends and the unique adaptations countries implement to suit their educational contexts and learner needs.

Competencies in Language Subject Curricula across the Countries. The analysis of information on language curricula reveals that there is a universal commonality across all studied countries in L2 education, which lays the emphasis on developing the four core language skills: listening, speaking, reading, and writing, at both Basic and Secondary levels. At the Basic level, curricula consistently prioritize foundational skills such as understanding simple spoken language, reading basic texts, and writing short sentences, often focusing on everyday expressions, basic vocabulary, and simple grammar.

Despite these commonalities, notable differences exist in L2 curricula globally. Nepal's L2 curriculum is uniquely detailed in its competencies, emphasizing not just language use, but also collaborative learning ("work with peers to learn language together") and expressive skills ("express opinions, ideas and feelings using simple English") from the Basic level. The thematic content in Nepal is significantly more elaborate and context-specific, covering diverse topics like "Communication Technology and Market" and "Fruits and vegetables" at the Basic level, which provides a richer, more practical linguistic context compared to the broader content outlines from other nations.

At the basic education level, most countries introduce English as a compulsory subject by focusing on core communication skills: listening, speaking, reading, and writing. In Nepal, students begin learning English in Grade 1, building vocabulary, pronunciation, and grammar foundations. China, Japan, Bhutan, and South Korea align their English curricula with international standards like CEFR, emphasizing reading short texts, simple conversation skills,

and writing basics. India and Bangladesh also promote early fluency and comprehension through activity-based learning. In Southeast Asia, countries such as Singapore and Malaysia adopt structured programs that support oral fluency and written accuracy, while Sri Lanka prioritizes grammar and vocabulary in early years. Table in Appendix L shows the comparison.

In Western and European systems, foundational English instruction supports literacy and cross-cultural awareness. The USA and Canada use state- or province-specific frameworks that balance language fluency with expressive writing and comprehension strategies. Australia's curriculum focuses on intercultural capability, communication, and early literacy. In Finland, Germany, Denmark, and Brazil, English instruction follows international benchmarks with an emphasis on reading fluency, vocabulary use, and basic composition. South Africa and Tanzania incorporate English in early or later stages depending on language policy, aiming to build oral competence and foundational reading skills. Despite linguistic diversity, the shared goal is clear: equip students with the ability to understand, use, and express themselves confidently in English across cultural and academic settings.

Across secondary education systems, most countries aim to equip students with strong competencies in English as a second language by focusing on communication, comprehension, and expressive skills. In Nepal, the curriculum emphasizes listening, reading, speaking, and writing fluency alongside vocabulary and grammar control. Similarly, China, Bhutan, Japan, and South Korea promote spoken interaction and the ability to interpret literary and informational texts, often preparing students for national exams or CEFR-aligned proficiency. India, Bangladesh, Malaysia, and Sri Lanka prioritize accurate writing, oral expression, and the effective use of contextual grammar, with a growing emphasis on real-life communication. Singapore integrates multimodal literacy and critical reading into its high-performing framework (Curriculum Planning and Development Division, 2023), while Brazil encourages intercultural understanding through genre-based writing and comprehension (Batista, 2020).

Western and Nordic countries frame second-language English competencies around creativity, academic writing, and cultural fluency. In the USA and Canada, students engage with literature, essays, and oral presentations, often through state- or province-based ESL standards. Australia and the UK focus on persuasive and analytical writing, structured speech, and precise grammar, supported by national exams like the HSC or GCSE. Finland, Denmark, and Germany promote multi-literacy and intercultural dialogue, helping students apply English fluently across subjects and social contexts. South Africa and Tanzania also prioritize language functionality, with students expected to articulate ideas, write effectively, and engage in classroom discussions using English by the end of secondary school. Across all systems, English is viewed as both an academic tool and a gateway for global communication.

Contents in Language Subject Curricula across the Countries. To enrich the content of Nepal's English curriculum as a second language, it is important to align learning materials with real-world communication needs and cultural relevance. Incorporating engaging texts such as short stories, dialogues, news articles, and functional writing tasks (e.g., emails, posters, instructions) can make language learning more practical and meaningful. Introducing age-

appropriate literature, both local and global, helps students appreciate diverse perspectives and develop reading fluency. Content should gradually build complexity across grades, starting with everyday vocabulary and progressing toward abstract themes and structured argumentation. Including more visual and audio resources like videos, podcasts, and illustrated texts can also support different learning styles. Finally, integrating themes related to health, environment, technology, and social values ensures that English becomes a tool for both academic success and thoughtful citizenship. The table in Appendix M compares the contents across the countries studied.

Across the listed countries, English or another second language is typically facilitated through structured teaching across primary and secondary levels, beginning with foundational literacy and communication. In Nepal, English is compulsory from Grade 1, with emphasis on listening, speaking, reading, and writing, supported by vocabulary and grammar development. Similarly, China, Japan, Bhutan, South Korea, and India introduce English early and focus on communicative competence, comprehension, and contextual grammar. Singapore and Malaysia, which use English as a medium of instruction, embed advanced language skills from the start. Bangladesh and Sri Lanka follow communicative language teaching approaches, while Brazil, Denmark, and Germany integrate intercultural awareness and literacy into their second language frameworks. In the USA and Canada, English is the core medium, and second language programs (e.g., ESL or EFL) adapt instruction to student backgrounds.

By secondary level, most systems scale up to academic literacy, critical thinking, and content-based language learning. Nepal and Bhutan continue to integrate English across subjects with an emphasis on literature, composition, and analytical writing (Royal Government of Bhutan, Ministry of Education, 2022). Countries like China, Japan, Korea, and India link second language learning with national exams, fostering reading comprehension and expressive writing. Singapore and Malaysia incorporate multimodal learning, while Australia and the UK use national standards to guide literature analysis and genre-based writing. Nordic systems like Finland and Denmark promote multilingualism and cultural fluency through project-based learning (Danish Ministry of Education, 2020). In South Africa and Tanzania, English evolves from foundational fluency toward advanced reading, structured writing, and real-life communication to support academic success and national integration.

Learning Facilitations in Language Curriculum in the Countries. The analysis of information on learning facilitation and assessment methods shows that many countries adopt active and student-centered learning approaches. Standard techniques include group work, hands-on activities, and inquiry-based learning, such as in South Korea's 5E model or Finland's phenomenon-based learning. The use of ICT tools and digital resources like multimedia lessons, virtual labs, or smart boards appears in countries such as India, China, Singapore, and Malaysia. Most countries, including Nepal, encourage problem-solving, project-based learning and field activities to make learning more relevant and connected to real life.

To strengthen English language learning in Nepal's school curriculum, it would help to move beyond textbook-based instruction toward more immersive and interactive approaches.

Classrooms could integrate real-world communication tasks like role-plays, storytelling, and small group discussions to improve fluency and confidence. Supporting teachers with training in student-centered and communicative methods, such as activity-based learning, digital media use, and cross-skill integration, would boost engagement. Creating opportunities for learners to hear and use English authentically, through videos, songs, or peer interactions, can make language acquisition more meaningful. Strengthening exposure and practice across all four skills, listening, speaking, reading, and writing, helps ensure that English becomes a tool for both academic growth and daily expression. The curriculum in Nepal also features an exceptionally wide array of "Facilitation Processes", from "story-telling and singing" to "Technology friendly class" and "Problem solving method," indicating a highly multifaceted and adaptive teaching methodology.

Pedagogical approaches frequently involve interactive and repetitive methods, including songs, role-plays, flashcards, and group work, to facilitate initial language acquisition. Moving to the Secondary level, there is a consistent progression towards more advanced L2 proficiency, requiring students to interpret complex texts, write structured responses, and communicate ideas with greater accuracy and fluency. All countries integrate grammar, composition, and varied reading materials into their Secondary L2 content, aiming for a more sophisticated command of the language. Thus, pedagogical approaches commonly involve interactive methods, group work, and the use of diverse textual materials. Table given in Appendix N compares cross-country pedagogy and assessment in planned curricula.

Assessment System in Language Curriculum across the Countries. Evaluation methods in language curricula at primary and lower secondary levels in most countries combine informal and formal methods to nurture foundational skills. In Nepal, China, Bhutan, and Bangladesh, continuous assessment systems are common, using reading aloud, oral responses, spelling, and writing exercises. Countries like Japan, Korea, and India include dictation, grammar tasks, and classroom-based evaluation. Western models such as the USA, UK, and Australia use teacher-led formative assessments alongside standardized tests to gauge reading fluency, composition skills, and listening comprehension. Singapore, Malaysia, and Sri Lanka incorporate oral exams and creative writing tasks to assess language use and expression, with increasing emphasis on comprehension and grammatical accuracy as students' progress.

At the upper secondary level, language evaluation becomes more structured and examination-driven. Nepal, India, Bangladesh, and Sri Lanka assess students through national board exams that cover literature, grammar, and essay writing. Japan, South Korea, and China use high-stakes exams to evaluate literary interpretation and compositional precision, often with oral presentations or research tasks. Western systems like the UK, Canada, and Australia blend coursework with national exams that include critical reading and expressive writing. Brazil, Tanzania, and South Africa emphasize cultural content and oral fluency alongside written assessments. Overall, while formats vary, the emphasis at this stage is on students' ability to think critically, express ideas clearly, and engage meaningfully with texts in the language.

Across primary and lower secondary levels, most countries use a mix of formative and summative methods to evaluate English as a second language. Nepal, Bhutan, India, and Bangladesh assess students through oral responses, reading aloud, listening tasks, and basic grammar or composition exercises. China, Japan, and South Korea increasingly align assessments with CEFR benchmarks, integrating classroom interaction, vocabulary tests, and structured written tasks. Southeast Asian countries like Singapore and Malaysia embed classroom-based assessments and CEFR descriptors into lesson activities. Western nations such as the USA (American International School of Johannesburg, n. d.) and Canada rely on proficiency frameworks like WIDA or CLB, using authentic tasks, performance assessments, and differentiated evaluations. Brazil, the UK, Denmark, Germany, and Finland emphasize formative feedback and intercultural literacy through project-based activities and national benchmarks.

At the upper secondary level, evaluations become more standardized and exam-oriented. Nepal and India rely on board exams focused on grammar, essay writing, comprehension, and literary analysis. South Korea, Japan, and China assess English proficiency via national entrance tests, often measuring academic fluency and critical reading. Countries like Singapore, Malaysia, and Sri Lanka blend oral presentations, listening tasks, and writing portfolios with summative exams. Western systems (USA, Canada, UK, and Australia) integrate coursework, standardized tests like SAT or GCSEs, and oral exams to evaluate fluency, reasoning, and communication. Nordic and European systems, including Finland, Germany, and Denmark, maintain formative practices but introduce structured oral and written assessments to gauge academic language use and cultural competence in English. South Africa and Tanzania use national curriculum frameworks with exams focused on comprehension, writing mechanics, and speech clarity.

To improve how English is evaluated as a second language in Nepal's school curriculum, it would be beneficial to go beyond grammar-heavy written exams and include speaking, listening, and interactive tasks that reflect real-world communication. Adopting global standards like CEFR descriptors can help measure actual language use, and incorporating classroom-based assessments—such as presentations, portfolios, and peer feedback—would encourage deeper learning. Training teachers in assessment literacy and designing tasks that integrate multiple skills, such as reading and discussion or listening and writing, can further enrich the process. These changes would foster a more balanced, practical, and student-centered approach to language evaluation.

Nepal's assessment methods need to be distinctly comprehensive and continuous, incorporating "Portfolio and continuous assessment," "Peer evaluation," "Self-evaluation," and "Parents' reaction," which contrasts with the more traditional periodic or standardized testing observed in many other countries. Some countries, like the USA and Canada, explicitly mention bilingual support and ESL/ELD programs, highlighting a more direct focus on supporting non-native English speakers, a detail less prominent in other country descriptions.

Sum-up

Based on the above discussion, it is known that a number of countries have successfully moved toward competency-based, learner-centered education systems. Finland emphasized soft

skills like sustainability and ICT, empowering teachers and students alike through multidisciplinary modules and student agency (Mykrä, 2023). Singapore focused on future-readiness with strong integration of STEM, design thinking, and social-emotional learning. South Korea rebalanced academic rigor with well-being, narrowing achievement gaps through teacher training and student support. Meanwhile, Canada incorporated indigenous perspectives and prioritized inclusion through Universal Design for Learning and mental health education.

In South and Southeast Asia, curricula have centered on equity, relevance, and foundational learning. India's NEP 2020 and Curriculum Reform 2025 are shifting education away from traditional methods toward experiential learning, foundational skills, and mother-tongue instruction. Bhutan aligned with the Cambridge curriculum, reduced overload, and infused sustainability and cultural heritage. Bangladesh has introduced interdisciplinary and project-based learning but faces implementation hurdles (Directorate of Primary Education, 2017). Vietnam's GEP 2018 emphasized student-centered learning and teacher empowerment; however, progress is hindered by unclear guidance and capacity gaps.

East Asia's and Africa's reforms demonstrate diverse strategies for localizing and modernizing curricula. China has moved from top-down knowledge delivery to localized, inquiry-driven learning, with strong emphasis on moral education and digital skills. Japan introduced programming and STEM in early grades, shifting to broader competency assessments. South Africa restructured its post-apartheid system through simplified, equity-oriented curricula. Tanzania's early-grade 3Rs showed how focused interventions in literacy and numeracy can generate significant improvements.

Western nations have maintained a balance of inclusivity, coherence, and flexibility. The UK promoted a knowledge-rich curriculum with greater subject clarity and global benchmarking. The US advanced standards-based learning via Common Core, and then shifted toward improving instructional quality and teacher well-being. Australia streamlined its curriculum while reinforcing First Nations perspectives and critical thinking. Brazil's BNCC unified education frameworks and defined key competencies, though decentralization and instability present obstacles. Denmark spotlighted flexible, competency-based learning and school autonomy (European Commission, n. d.), and Sri Lanka tackled reconciliation through peace education and life skills development.

As the lesson, Nepal can learn from successful international curriculum reforms by empowering teachers through stronger autonomy and ongoing professional development, embedding essential soft skills like sustainability, digital literacy, and critical thinking throughout subjects, and decentralizing curriculum design so that local cultures and community needs are properly reflected. Strengthening formative and alternative assessment methods can enhance student learning and inclusivity, while balancing global educational standards with indigenous knowledge will help create a curriculum that is both future-oriented and culturally grounded.

Chapter Four: Findings, Conclusion, and Implications

This chapter consists of findings, conclusion and implications from the above analysis and interpretation of data. Based on the cross-country comparison of school level curriculum of Nepal across different countries, there emerge several insights across the curriculum from ECD to Grade 12 in Mathematics, Science, and languages. Curriculum gaps in Nepal (ECD–Grade 12) can be seen which affect teachers and students, particularly in Mathematics, Science, and first and second languages

Key Findings

The key findings categorically given here have been drawn through the systematic analysis of the curricular data extracted from planned curricula of twenty-one countries. The key findings corresponding to research objectives are broadly categorized as similarities and difference across the curricula which contain theoretical principle, school education structure, and competencies, contents, learning facilitations, and assessment system stated in curriculum.

Similarities in the Curricula of Nepal with the other Countries

The findings on similarities of curricula of Nepal and other selected countries found through a systematic review and analysis are thematically given below.

Similarities in Theoretical principles. The theoretical similarities are given below.

- Competency-based approaches: Nepal's focus on equipping students with real-life skills aligns with the competency-based approaches widely adopted in nations such as India, Finland, Canada, and Australia. Many Asian countries, including Nepal, prioritize competency-based learning, encouraging critical thinking, creativity, and practical problem-solving skills.
- Cultural relevance: Cultural relevance is a strong theme in Nepal, similar to Bhutan, Vietnam, South Africa, and Brazil, where indigenous knowledge, heritage, and social values are integrated into the curriculum.
- Technological innovation: Nepal's efforts to modernize education through ICT tools are in line with countries like Singapore, the USA, and Canada, which also emphasize technological innovation and digital learning.
- Inclusivity and equity: Nepal shares the goals of inclusivity and equity with countries such as South Africa, Tanzania, and Bangladesh, aiming to reach all students regardless of background.
- Shared values and ethics: School-level curricula in many Asian countries, including Nepal, India, China, Bhutan, Japan, South Korea, Bangladesh, Malaysia, Singapore, and Sri Lanka, tend to emphasize shared values and ethics, fostering civic responsibility, moral growth, and cultural identity.
- Constructivist learning theory: The school-level curriculum in Nepal, like in Singapore, Australia, and Finland, integrates soft skills, lifelong learning, and community partnerships based on constructivist learning theory.

Similarities in General Competencies. Similarities in general competencies are given below. The similarities in general competencies across the selected countries have been dealt into three levels: preprimary, basic, and secondary

Pre-Primary Level Competencies. This level is also known as Early Childhood Development and Education (ECDE) in general.

- Holistic development: Nepal, along with 20 other countries studied (including Brazil, South Africa, Finland, Japan, Denmark, and Australia), strongly emphasizes holistic development, supporting children's physical, emotional, cognitive, and social growth in an integrated manner.
- Language and communication: Language and communication development, especially in home and national languages, are consistently prioritized in Nepal and other countries like China (Mandarin-speaking), mirroring a foundational focus.
- Early numeracy and logical thinking: Early numeracy and logical thinking are common across frameworks, from Singapore to Bhutan, and also in Nepal.
- Social-emotional Skills: Social-emotional skills like self-regulation, empathy, and cooperation are widely fostered in Nepal and countries such as the UK, South Korea, and Finland.
- Creative expression: Music, movement, art, and imagination are central to cultivating creative expression in Nepal and are promoted across settings from Canada to Bhutan.
- Physical development: Physical development, including motor skill enhancement, hygiene, and health habits, is encouraged in Nepal and is a common priority in curricula from Singapore to India.

Basic Level Education Competencies. This level is also known as elementary or primary and lower secondary level in the studied countries. The similarities found from study are given below.

- Patriotism, national identity, and civic values: Nepal, India, Bhutan, Bangladesh, Sri Lanka, China, Malaysia, Singapore, and Vietnam share a strong emphasis on integrating patriotism, national identity, and civic values into foundational learning.
- Language development, digital literacy, logical reasoning, and inquiry-based STEM: These systems prioritize language development (often in home languages), digital literacy, logical reasoning, and inquiry-based Science and math education.
- Holistic development and values-based education: Like Finland, Denmark, Germany, and the UK, Nepal also emphasizes holistic development through values-based education and democratic learning environments.
- Self-regulation, curiosity, social cooperation, literacy, and numeracy: Across all countries, including Nepal, there is recognition of the need for learners to develop self-regulation, curiosity, social cooperation, and foundational literacy and numeracy.
- Integration of digital tools: Nepal, Finland, South Africa, Australia, and Singapore support the integration of digital tools for learning, while embedding ethical use and responsible online behavior.

- Shift to learner-centered, interdisciplinary learning: Despite contextual diversity, a common trend, including in Nepal, is the shift from content-heavy curricula to learner-centered, interdisciplinary learning.
- Alignment with broader developmental goals: Countries, including Nepal, are increasingly aligning education with broader developmental goals, encouraging learners to thrive both personally and as responsible global citizens.

Secondary Level Competencies. The secondary level denotes from grade 9 to 12 in general.

- Holistic development, critical thinking, digital literacy, and civic responsibility: Nepal shares these core educational competencies with nations like India, China, Japan, and European countries such as Finland and Germany.
- Competency-based learning and national priorities: In South and East Asia, countries including Nepal, India, Bhutan, China, and Bangladesh structure secondary education around competency-based learning, integrating national priorities like civic responsibility, sustainable development, and moral education.

Similarities in School Education Structure. In terms of school education structure, following similarities are found.

- Three Main Levels: Nepal, like all countries listed, organizes its school education into three main levels: Early Childhood Development (ECD), Basic, and Secondary.
- Overlapping Age Ranges in ECD: The age range for ECD in Nepal (3-5 years) is similar to most other countries, which generally fall within 3-6 years (e.g., India, Bhutan, Bangladesh, Sri Lanka, China, Japan, Vietnam, Malaysia, S. Korea, UK, Denmark, Germany, Brazil, and Canada).
- Basic education as foundation: All countries, including Nepal, have a "Basic" or "Primary" level that serves as the foundational stage of formal schooling.
- Secondary education for deeper learning: All countries, including Nepal, have a "Secondary" level that aims to deepen knowledge and skills.
- Compulsory basic education (Generally): While not explicitly stated for all, the document mentions that the basic level is compulsory and free in almost all countries, aligning with the general global trend.

Subject- and Component-Wise Similarities. The similar findings found from the subject-wise and their component-wise analyses across the countries are presented below.

Similarities in Components of Mathematics Subject. Similarities in Mathematics curriculum components are given below.

Competencies in Mathematics. In terms of competencies, the findings are given below.

- Foundational numeracy and geometric understanding (Basic Level): Nepal, along with all sampled countries (including India, Bhutan, Bangladesh, Sri Lanka, China, Japan, Vietnam, Singapore, Malaysia, S. Korea, UK, Denmark, Germany, Finland, Tanzania, South Africa, Brazil, USA, Canada, and Australia), prioritizes foundational numeracy

and geometric understanding at the Basic level. This includes a focus on number sense, shape recognition, and solving everyday problems.

- Shift to complex domains (Secondary Level): As learners progress to the Secondary level, there is a universal shift, including in Nepal, towards more complex mathematical domains such as algebra, geometry, statistics, and probability. This stage emphasizes analytical thinking, interpreting data, and solving advanced problems.
- Introduction of basic concepts (Primary Level): At the primary level, countries like Nepal, China, India, Bhutan, and Sri Lanka introduce math through basic arithmetic, shapes, measurements, and patterns.
- Introduction of Algebra, Geometry, Statistics, and Data Handling (Lower Secondary): Most countries, including Nepal, introduce algebra, geometry, statistics, and data handling in the lower secondary phase.
- Specialized and rigorous curricula (Upper Secondary): At the upper secondary level, curricula generally become more specialized and rigorous, with advanced topics like calculus, trigonometry, and mathematical reasoning. The focus shifts towards preparing students for tertiary education or professional applications, with a strong emphasis on logic, modeling, and analytical thinking.

Mathematics Contents. In terms of contents, the findings that are similar are given below.

- Foundational skills in primary grades: Nepal's Mathematics education, like many other countries, begins with foundational skills such as numbers, operations, shapes, and measurements in the primary grades. This mirrors progression in countries like India, Sri Lanka, Bangladesh, and Tanzania, which also emphasize number sense, basic operations, measurement, geometry, and introductory data handling in primary and lower secondary levels.
- Progression to abstract concepts in middle school: Nepal gradually introduces more abstract concepts like fractions, geometry, data handling, and algebra in middle school, consistent with global trends.
- Advanced topics in secondary levels: As students progress to lower and upper secondary levels, Nepal's curriculum, like that of China, India, Bhutan, Japan, and Singapore, expands to include trigonometry, statistics, probability, and calculus, with structured transitions into advanced topics such as matrices, vectors, and mathematical modeling.
- Emphasis on real-life applications: Nepal's curriculum, like many Asian counterparts (India, Bangladesh, Bhutan, Sri Lanka), connects Mathematics with real-life applications and national development goals. Western and Southern nations also frequently embed cross-curricular competencies and proficiencies like fluency, reasoning, and communication, integrating problem-solving and conceptual understanding to support future readiness.
- Grade-wise structure: Nepal follows a grade-wise structure from basic arithmetic and geometry in primary school to algebra, trigonometry, and statistics in secondary levels, mirroring the progression in countries like India, Sri Lanka, Bangladesh, and Tanzania.

Learning Facilitations in Mathematics. In terms of learning facilitation in curriculum documents, the similarities derived from the analysis are given below.

- National priorities and educational philosophies: The facilitation process in Nepal, like all other countries mentioned, is influenced by its national priorities and educational philosophies.
- Emphasis on local context (Possible Similarity): While not explicitly stated for Nepal, Bhutan, a neighboring country, emphasizes local context and holistic play-based learning. This could be a potential similarity with Nepal's approach, given regional commonalities, though the document does not explicitly state it.

Assessment System in Mathematics. In terms of assessment provisions mentioned in the Mathematics curricula, the similarities found from the analysis are given below.

- Mixed assessment approach: Nepal, like almost all countries, implements a mix of formative and summative assessments, combining teacher observations, class tests, and project work.
- Portfolio-based evaluations and classroom participation: Nepal, the UK, and Singapore all utilize portfolio-based evaluations and ongoing classroom participation checks.
- Continuous/competency-based evaluations: Nepal, India, Bhutan, and Bangladesh emphasize continuous or competency-based evaluations, utilizing classroom observations and structured tasks.
- National-level examinations: Similar to many countries (e.g., Singapore with the PSLE, China with the Gaokao, and Bangladesh with the SSC), Nepal uses national-level examinations at the end of the basic and secondary levels.
- Board examinations at the upper secondary level are used in Nepal, India, Sri Lanka, and Bangladesh, which all employ board examinations that combine theoretical and practical elements.
- Foundational skills focus (Primary/Lower Secondary): Like most countries, Nepal's Mathematics evaluation in primary and lower secondary levels likely focuses on building foundational skills through a mix of formative and summative assessments, including oral questioning, worksheets, short written tests, and practical problem-solving activities.

Similarities in Components of Science Subject Curriculum. The similarities in the Science curriculum are given below.

Competencies in Science. In terms of competencies mentioned in the Science curriculum documents, the similarities found are given below.

- Foundational understanding of the natural world: Nepal, like most other listed countries, focuses on developing a foundational understanding of the natural world.
- Scientific inquiry and observation (Basic level): A strong commonality across Nepal and most other listed countries is the universal emphasis on scientific inquiry and observation from the Basic level. This encourages learners to explore the natural world, identify patterns, and ask questions.

- Core scientific content areas: All countries broadly cover core scientific content areas such as environment, living things (biology), matter (chemistry), and energy/force (physics) across both Basic and Secondary levels.
- Deeper dive in secondary education: The transition to Secondary education universally involves a deeper dive into specialized scientific disciplines (e.g., Physics, Chemistry, Biology) and the development of more complex skills like performing experiments, analyzing data, forming hypotheses, and applying scientific concepts to real-world issues.
- Foundational skills and transition to structured inquiry: Science education across Nepal, China, and India begins with foundational skills like observation and classification, gradually transitioning to structured inquiry and deeper exploration of physical, biological, and environmental concepts.
- Focus on scientific methods and experimentation (Secondary level): Secondary levels in Nepal, China, and India focus on scientific methods, hypothesis testing, and experimentation, with curriculum reforms promoting real-world relevance and civic engagement.
- Inquiry-driven approaches: Singapore and Malaysia, like Nepal, emphasize inquiry-driven approaches where students move from observing diversity and interactions in nature to tackling ethical and conceptual models, with a strong focus on scientific literacy and global preparedness.

Science Contents. In terms of contents in Science curriculum documents, the findings are given below.

- Content progression and foundational focus: Nepal's school Science curriculum shares many similarities with global models in terms of content progression and foundational focus. It begins with a basic understanding of living and non-living things, the human body, weather, and health at the primary level.
- Advancement to physical, biological, and earth Sciences: Nepal advances through physical, biological, and Earth Sciences in lower secondary, culminating in specialized topics such as mechanics, chemical reactions, and environmental Science in upper grades.
- Integrated or environmental Science in primary grades: Most countries, including Nepal, introduce Science in an integrated or environmental format in the primary grades.
- Transition to formal Science in lower secondary: During lower secondary education, nearly all systems shift toward formal Science instruction with separate topics such as physics, chemistry, and biology. Nepal, Bhutan, and Bangladesh transition from integrated models to specific subjects around Grades 6–9, embedding practical work and scientific reasoning.
- Grade-wise progression: Nepal and Tanzania both follow a grade-wise progression, introducing basic Science concepts like observation and classification in early grades, and expanding to biology, physics, and chemistry in lower secondary levels.
- Emphasis on inquiry, experimentation, and environmental awareness: Nepal emphasizes inquiry, experimentation, and environmental awareness, similar to South Korea's focus

on creativity and collaboration, and South Africa's integration of investigation and communication skills.

- Real-life applications and environmental relevance: Nepal, Tanzania, and South Africa prioritize real-life applications and environmental relevance in their curricula.
- Integrated themes in Asian Science education: Across Asia, Science education typically begins with integrated themes such as living and non-living things, health, weather, and basic physical principles. As learners advance to lower secondary, the curriculum transitions into core subjects like physics, chemistry, and biology, emphasizing inquiry skills, ecological understanding, and health awareness. By upper secondary, many countries offer specialized Science streams that strengthen practical skills, experimental learning, and environmental relevance.

Learning Facilitations in Science. In terms of learning facilitation in curriculum documents, the similarities derived from the analysis are given below.

- Grade-wise progression: Nepal, like Tanzania, follows a grade-wise progression in Science education. Early grades introduce basic concepts like observation and classification, expanding to biology, physics, and chemistry in lower secondary levels. This structured progression is also seen in Sri Lanka, Bangladesh, the United States, Canada, and many countries across Europe and Africa.
- Emphasis on inquiry, experimentation, and environmental awareness: Nepal emphasizes inquiry, experimentation, and environmental awareness. This is similar to South Korea's focus on creativity and collaboration, and South Africa's integration of investigation and communication skills. Nepal, Tanzania, and South Africa also prioritize real-life applications and environmental relevance in their curricula.
- Transition to core subjects in lower secondary: As learners advance to lower secondary, Nepal's curriculum, like many across Asia, transitions into core subjects such as physics, chemistry, and biology, emphasizing inquiry skills, ecological understanding, and health awareness.

Assessment System in Science. In terms of assessment provisions mentioned in Science curricula, the similarities found from the analysis are given below.

- Continuous/competency-based assessment: Nepal, along with India, Bhutan, and Bangladesh, relies on continuous or competency-based assessment systems, utilizing tools like worksheets, experiments, and group work.
- Combination of internal and external assessments: Nepal, similar to South Africa, combines internal continuous assessment with external board exams in lower and upper secondary grades.
- Structured and subject-specific assessments (Lower and Upper Secondary): Like most systems, Nepal's assessments in lower and upper secondary grades become more structured and subject-specific, introducing practical lab work and written exams to evaluate understanding in physics, chemistry, and biology.

- Alignment with formal curricula and national standards (Grade 10+): By Grade 10 or higher, Nepal, like nearly all countries, aligns Science evaluation with formal curricula and national standards, often blending theoretical knowledge with applied skills to prepare students for higher education and real-world challenges.
- Early informal methods: Across most countries, Science evaluation begins in primary school with informal methods like observation, oral questioning, activity-based learning, and class projects, which likely applies to Nepal as well.

Similarities in Components of Language Subject Curriculum. The similarities found in language curriculum are given below.

Competencies in Language Curriculum. In terms of competencies mentioned in Language curriculum documents, the similarities found are given below.

- There's a universal commonality across all studied countries, including Nepal, in emphasizing the development of the four core language skills: listening, speaking, reading, and writing, at both Basic and Secondary levels. At the Basic level, curricula consistently prioritize foundational skills such as understanding simple spoken language, reading basic texts, and writing short sentences, focusing on everyday expressions, basic vocabulary, and simple grammar. The shared goal is to equip students with the ability to understand, use, and express themselves confidently in English across cultural and academic settings.

Contents in Language Curriculum. In terms of contents in curriculum documents, the similarities derived from the analysis are given below.

- Content in language curricula generally builds complexity across grades, starting with everyday vocabulary and progressing toward abstract themes and structured argumentation. Most countries introduce English as a compulsory subject at the basic education level, focusing on core communication skills.

Learning Facilitations in Curriculum. In terms of learning facilitation in curriculum documents, the similarities derived from the analysis are given below.

- Across the listed countries, English or another second language is typically facilitated through structured teaching across primary and secondary levels, beginning with foundational literacy and communication. Many countries, including Nepal, adopt active and student-centered learning approaches. Common techniques include group work, hands-on activities, and inquiry-based learning. The use of ICT tools and digital resources like multimedia lessons, virtual labs, or smart boards appears in countries such as India, China, Singapore, and Malaysia. Most countries, including Nepal, encourage problem-solving, project-based learning and field activities to make learning more relevant and connected to real life.

Assessment System in Language curriculum. In terms of assessment provisions mentioned in Language curricula, the similarities found from the analysis are given below.

- The provided document states that many countries adopt active and student-centered learning approaches, and that the analysis covers learning facilitation and assessment methods.

Differences in the Curricula of Nepal from the other Countries

Differences in Theoretical Principles. Theoretically Nepal and the selected countries have been practicing different principles in curriculum designing.

- **Centralization vs. flexibility:** While flexibility and local adaptability are hallmarks of curricula in Denmark, Finland, and Canada, Nepal's system remained centrally guided and controlled has been decentralizing and empowering the province and local bodies for curriculum development through National Education Policy and National Curriculum Framework for School Education.
- **Emphasis on moral education and civic responsibility:** While Nepal's curriculum includes citizenship and value education, countries like Japan, China, and South Korea place a greater structural emphasis on moral education and civic responsibility.
- **Gross national happiness:** Bhutan stands out for its unique foundation on Gross National Happiness, focusing deeply on emotional well-being and ethical values, which is expressed not using term gross national happiness in the curricula of Nepal but has been placed in a different theme.
- **Local autonomy:** In the U.S., states and districts have an extensive local autonomy within federal guidelines; Nepal is promoting the local autonomy for curriculum development under the federal system.
- **Universal design for learning:** Canada builds its curriculum on learner-centered and equitable principles, applying the Universal Design for learning to ensure accessibility for all students. The specific approach/design highlighted literally in the global literature is implicitly in practice in Nepal's education policies and curriculum plans.

Differences in General competencies. The curricula from the selected countries are found differences in terms of general competencies which are presented below in level wise manner.

Pre-Primary Level Competencies – Also known as Early Childhood Development and Education (ECDE) globally.

- The curriculum planned by the selected countries are not difference in terms of general competencies at ECDE/pre-primary/kindergarten

Basic Level Competencies. The differences in basic level competencies in technology using in primary education found difference. In developed countries, technology using competency is expected to be sophisticated. Nepal is expanding digital access. The role being played by technology in basic/elementary education in countries like India, Bangladesh, and Tanzania, Nepal is also experiencing which is often shaped by infrastructure and equity challenges in developing countries.

Secondary Level Competencies. The differences at secondary level in term of competencies are given below.

- Balancing tradition and modern innovation: Nepal's unique commitment to balancing "respect for both tradition and modern innovation" sets it apart, reflecting a deliberate effort to integrate cultural heritage with forward-looking development.
- Strong foundation in life skills and compassionate citizens: Nepal explicitly mentions a "strong foundation in life skills" from the earliest stages and aims to develop "compassionate citizens," providing distinct nuances compared to broader statements in other countries.
- Instructional design: Nepal tends to eliminate using traditional teacher-led methods in curricular policy and plan, while countries like Denmark employ collaborative outdoor learning and Malaysia uses digital facilitation, with an increasing trend towards blending classroom and experiential learning globally.
- Integration of soft competencies: The curriculum plans in Nepal emphasizes foundational literacy, numeracy, values, and the integration of critical transversal competencies such as creativity, digital literacy, collaboration, and global awareness, which are more prominent in some global counterparts.

Difference in School Education Structure. The structural differences in education system of the studied countries are observed.

- ECD age range: The curricula from the selected countries reveal that the age of the students for grades and levels differs. Nepal's ECD is defined as 4 years (3-5 years). Many countries have 3-6 years range for ECD (e.g., India, Bhutan, Bangladesh, China, Japan, Vietnam, Denmark, Germany, Brazil, South Africa, and Tanzania). South Korea and Sri Lanka have ECD up to 5 years. Finland's pre-primary starts at 6 years.
- Basic Level Grades and Ages: Nepal's Basic level is Grades 1-8 (ages 5-12). Many countries also have Grades 1-8 for their basic level (e.g., India, Bhutan, Bangladesh, Sri Lanka, USA, and Canada). Some countries extend Basic education up to Grade 9 (e.g., China, Japan, Vietnam, South Korea, the UK, Denmark, Germany, Finland, Brazil, and South Africa). Malaysia's basic level is shorter, Grades 1-6. Singapore's basic level is longer, Grades 1-10. Australia's basic level is Years 1-6.
- Secondary Level Grades and Ages: Nepal's Secondary level is Grades 9-12 (ages 13-16). Many countries also have Grades 9-12 (or similar) for their secondary level, but the age ranges and specific grade groupings can vary. For instance, Sri Lanka's secondary goes up to Grade 13, (South Asia Human Development Sector, 2011) and the UK's goes up to Year 13. Germany's secondary can extend to Grade 13. Denmark and Finland's secondary starts later, at ages 16 and 17 respectively.
- Yearly teaching hours. While the overall three-tiered structure is common, Nepal's education system tends to have slightly shorter age ranges and fewer yearly instructional hours, particularly at the ECD level, compared to many other nations. The specific grade allocations within the basic and secondary levels also show variations across countries.

Subject- and Component-Wise Differences. The difference between Nepal and selected other countries' Mathematics, Science, and Language subject curricula are observed.

Difference in components of Mathematics subject. The differences found in Mathematics subject curriculum components (competency, contents, learning facilitations, and assessment systems) are given below.

Mathematics Competencies. The differences in Mathematics competencies are among the curricula from the selected countries are given below.

- "Mathematical knowledge, skills, thinking and attitude and application in daily life": Nepal's basic level Mathematics curriculum explicitly emphasizes the development of "mathematical knowledge, skills, thinking and attitude and application in daily life". This detailed articulation of attitudinal and practical application aspects at the basic level is highlighted as a notable difference compared to the general focus on standard global mathematical concepts in other countries.
- Innovative methods in primary math: Countries like Singapore use innovative methods such as the Concrete-Pictorial-Abstract model (Curriculum Planning and Development Division, 2023), and Finland emphasizes conceptual understanding, which are specific pedagogical approaches not explicitly mentioned for Nepal's primary level.
- Structured problem-solving and modeling: South Korea, Denmark, and Germany emphasize structured problem-solving and modeling, while Brazil and South Africa incorporate math into practical and civic contexts. The curriculum plan has mentioned the practical activities to be carried out by teachers. Civic contexts for Mathematics activities are not explicitly detailed for Nepal.
- Elective tracks and differentiated streams (Upper Secondary): Countries like Australia, Singapore, and India offer elective tracks based on students' academic goals, while Germany and South Africa differentiate between general and advanced streams at the upper secondary level. The document does not specify such differentiation or elective tracks for Nepal.

Curriculum Contents. Differences in contents in Mathematics curriculum are given below.

- Weakness in strand or phase-based framework: Nepal's school-level Mathematics curriculum seems to be adopting a strand or phase-based framework, which could better scaffold learning and make content transitions more coherent. In contrast, countries like Australia, Finland, and the UK use strand-based or key-stage models that offer greater clarity in skill development across themes such as number and algebra, measurement and geometry, and statistics. Adopting a strand-based structure in Nepal could enhance coherence and flexibility, helping teachers and students better track skill development.
- Emphasis on reasoning, problem-solving, and modeling: While Nepal covers a strong range of topics and focus on mathematical reasoning, problem-solving, and modeling in curriculum plan. This is a core emphasis in systems like South Korea, Germany, and Singapore, which integrate analytical thinking and real-world applications across levels, often linking math to scientific inquiry or technology. Finland also prioritizes these skills and links them to inquiry and critical thinking.

- Integration with broader themes/civic contexts: Countries like Finland, Australia, South Korea, South Africa, and Tanzania tend to embed Mathematics within broader themes like inquiry, sustainability, or practical problem-solving. Additionally, nations such as South Africa and Brazil embed Mathematics within civic contexts and development themes, helping learners connect abstract skills to everyday situations. Nepal can strengthen its impact by explicitly incorporating mathematical literacy into broader social, environmental, or entrepreneurial competencies.

Learning Facilitations of Mathematics. The differences found in learning facilitations in Mathematics curriculum are given below.

- Outdoor learning: Nepal, like Bangladesh and other South Asian systems, is less likely to emphasize outdoor learning compared to countries like Denmark and Australia, which incorporate it into their educational approaches.
- Structured vs. flexible approaches: While the specific details for Nepal aren't given, some South Asian systems, by implication, may differ from countries like Finland, which avoids heavy textbook use and focuses on collaborative design tasks. Conversely, countries like China and Vietnam utilize a more structured, textbook-driven method.

Assessment Systems in Mathematics. The differences found in assessment systems provisioned in Mathematics curriculum are given below.

- Reliance on standardized testing: In contrast to the USA and Canada, which rely heavily on statewide or provincial standardized testing, Nepal uses a mixed approach with both internal and external assessments.
- Emphasis on centralized vs. school-based assessments: Bhutan and Denmark prefer formative, school-based assessments over centralized exams, which contrasts with Nepal's use of external and national-level examinations.
- High-stakes national exams: Countries like China and South Korea use high-stakes national exams (e.g., Gaokao and CSAT), while Finland follows low-stakes sample assessments; Nepal's intensity of exams isn't explicitly categorized as "high-stakes" in the same way, but it does use national-level exams.
- Integration of pedagogical strategies: Nepal is noted as being weak in leveraging pedagogical strategies like the CPA (Concrete–Pictorial–Abstract) method used in Singapore or South Africa's domain-based approach to improve understanding and retention, especially among diverse learners.
- Differentiated math tracks: Countries like Singapore, South Korea, and Australia offer differentiated math tracks assessed through rigorous national exams, a specific differentiation not mentioned for Nepal.
- Evaluation of complex mathematical thinking: The UK, Germany, and Brazil evaluate complex mathematical thinking, including calculus, statistics, and modeling through their assessment systems, a level of detail not specifically highlighted for Nepal's upper secondary assessments beyond "theoretical and practical elements".

Difference in Components of Science Subject Curriculum. The differences found in Science subject curriculum components (competency, contents, learning facilitations, and assessment systems) are given below.

Science Competencies. The differences in Mathematics competencies are among the curricula from the selected countries are given below.

- Emphasis on environmental aspects: Nepal's Science curriculum specifically emphasizes awareness of environmental cleanliness, health, and the interrelationship between biodiversity and the environment, alongside creative expression through arts and technology. The developed countries have focused mostly more technological competencies than the naturalness and holistic perspective.
- Cultural and emotional development: In Bhutan and Japan, Science learning is deeply connected to cultural and emotional development. Bhutan's curriculum fosters curiosity and environmental awareness, aligning with Gross National Happiness, while Japan promotes creativity and scientific reasoning through structured competencies, advancing to modeling and societal application in higher grades. Though the curriculum of Nepal has not stated the happiness competencies explicitly, it has performed happiness and occupied 92th rank of the world, and as the happiest country in Asia in the year 2025 report.

Curriculum Contents. Differences in contents in Science curriculum are given below.

- Starting grade for science instruction: Nepal begins Science instruction from Grade 4. In contrast, countries like China, Malaysia, and the USA start as early as Grade 1 or Kindergarten, emphasizing observation, inquiry, and simple experiments. Singapore (Curriculum Planning and Development Division, 2022) and Japan introduce Science from Grade 3.
- Integration of transversal competencies: While Nepal's content structure is clear, it could benefit from deeper integration of transversal competencies such as inquiry skills, ethical reasoning, and sustainability, which are emphasized in places like Finland, Australia, and South Korea.
- Structured learning around experimentation and thematic depth: Countries like Denmark, South Korea, and Brazil structure learning around experimentation, problem-solving, and thematic depth, often guided by national standards or competency frameworks.
- Strand-based structure: Australia uses a strand-based structure (understanding, inquiry, human endeavor). Nepal could adopt Australia's strand model to strengthen clarity and thematic cohesion across grades.
- Science as a social and ethical pursuit: Australia and South Africa embed Science as a social and ethical pursuit, which helps students connect Science to human contexts. Nepal may benefit from more explicit inclusion of ethical reasoning and Science-society links to enrich its competencies.

- Rigor through performance-based learning/assessments: South Korea adds rigor through performance-based learning and national assessments. Australia fosters student curiosity with flexible, inquiry-driven evaluation.
- Enhancing continuous assessment: Nepal's continuous assessment system could be enhanced by incorporating more formative feedback and emphasizing soft skills like digital literacy and sustainability, features found in Australian and Korean models.
- Tying science to civic responsibility vs. emotional development/creativity: Countries like Nepal tie Science to civic responsibility. In contrast, Bhutan aligns it with emotional development, while nations like Japan, Singapore, and Malaysia promote creativity, modeling, and ethics in scientific literacy.

Learning Facilitations in Science curriculum. The differences found in learning facilitations in Science curriculum are given below.

- Explicit inclusion of ethical reasoning and science-society links: Australia and South Africa embed Science as a social and ethical pursuit, connecting Science to human contexts. Nepal may benefit from more explicit inclusion of ethical reasoning and Science-society links to enrich its competencies. Nations like Japan, Singapore, and Malaysia also promote creativity, modeling, and ethics in scientific literacy.
- Hands-on learning and environmental awareness for national development: Nepal emphasizes learning activities widely and explicitly. South Africa and Tanzania specifically promote hands-on learning and environmental awareness to develop scientific literacy in support of national development.
- Focus on emotional development: Bhutan aligns Science education with emotional development which is not explicit in Science curriculum of Nepal.
- Integration of critical thinking, problem-solving, and technological literacy in early grades: Countries such as Australia, South Africa, and Tanzania integrate biology, chemistry, physics, and Earth Sciences in early grades, with critical thinking, problem-solving, and technological literacy emphasized as students' progress toward tertiary and civic readiness.

Assessment Systems in Science Curriculum. The differences found in assessment systems provisioned in Science curriculum are given below.

- Formative feedback and soft skills: Nepal's continuous assessment system could be enhanced by incorporating more formative feedback and emphasizing soft skills like digital literacy and sustainability, features found in Australian and Korean models.
- Performance-based learning and national assessments: South Korea adds rigor through performance-based learning and national assessments, a specific characteristic not highlighted for Nepal.
- Flexible, inquiry-driven evaluation: Australia fosters student curiosity with flexible, inquiry-driven evaluation, which differs from Nepal's emphasizes formative assessment approaches.

- Performance tasks, experiments, research reports: South Korea and Japan include performance tasks, experiments, and even research reports in their assessments. Research activities and report writing are not explicitly mentioned in the curricula of Nepal.
- Environmental awareness and real-life applications for national development: While Nepal considers environmental relevance; South Africa and Tanzania specifically incorporate themes of environmental awareness and real-life applications to support national development.
- National/provincial frameworks for inquiry and data analysis: In countries like the USA, UK, and Canada, national or provincial frameworks guide the use of inquiry, data analysis, and hands-on investigations in assessment. Inquiry related data analysis is not explicit in the curricula of Nepal.
- Diversifying assessment approaches and embedding Science in societal/developmental contexts: Nepal might consider diversifying assessment approaches and embedding Science within broader societal and developmental contexts to strengthen its global alignment. Adopting a more competency-driven and socially grounded Science curriculum could better prepare students for global citizenship and local innovation.

Difference in Components of Language Subject Curriculum. The differences found in Language subject curriculum components (competency, contents, learning facilitations, and assessment systems) are given below.

Language Competencies. The differences in Language competencies are among the curricula from the selected countries are given below.

- Nepal's L2 curriculum is uniquely detailed in its competencies, emphasizing not just language use, but also collaborative learning ("work with peers to learn language together") and expressive skills ("express opinions, ideas and feelings using simple English") from the Basic level. Western and Nordic countries often frame second-language English competencies around creativity, academic writing, and cultural fluency.

Curriculum Contents. Differences in contents in Language curriculum are given below.

- The thematic content in Nepal is significantly more elaborate and context-specific, covering diverse topics like "Communication Technology and Market" and "Fruits and Vegetables" at the Basic level, which provides a richer, more practical linguistic context compared to the broader content outlines from other nations.
- To enrich Nepal's English curriculum, aligning learning materials with real-world communication needs and cultural relevance, incorporating engaging texts, age-appropriate literature, and visual/audio resources, and integrating themes related to health, environment, technology, and social values are suggested.

Learning Facilitations in Language Curriculum. The differences found in learning facilitations in Language curriculum are given below.

- In Nepal, English is compulsory from Grade 1, with emphasis on listening, speaking, reading, and writing, supported by vocabulary and grammar development. China, Japan, Bhutan, South Korea, and India introduce English early and focus on communicative

competence, comprehension, and contextual grammar. Singapore and Malaysia, which use English as a medium of instruction, embed advanced language skills from the start.

- The facilitation process varies depending on national priorities and educational philosophies; for instance, Bhutan emphasizes local context and holistic play-based learning, while Japan uses lesson study and collaborative planning. Finland avoids heavy textbook use and focuses on collaborative design tasks, whereas China and Vietnam follow a more structured, textbook-driven method.

Assessment Systems in Language Curriculum. The document mentions no differences in general assessment methods between Nepal and selected other countries. Specific assessment procedures for assessing the language skills/competencies are suggested by the curriculum plan.

Conclusion

Curricular reforms around the world reflect a convergence of global priorities and local values. Nepal's curriculum stands at a unique crossroads where tradition meets innovation. While global trends point toward student-centered, competency-based, and inclusive education, Nepal has embraced these ideas with a distinctive cultural flavor. Its explicit inclusion of indigenous knowledge, sustainability, and moral values highlights an educational philosophy deeply rooted in national identity. Unlike many countries that adopt broader descriptors, Nepal's curricula are richly detailed and pedagogically diverse. It has been decentralizing structural authority in curriculum development like other countries i.e., Canada and Finland. Nepal's proactive use of continuous and formative assessment strategies provides a holistic view of learner progress. Its early introduction of digital literacy and communication skills aligns well with global efforts for future-ready education. Yet, systematic integration of transversal competencies remains a developing area. Nepal's unique positioning of arts and creativity within core academic subjects fosters interdisciplinary thinking. Comparative insights suggest that Nepal is simultaneously a follower and innovator in educational reform. Drawing from global best practices enhances both relevance and quality. Although the curriculum is robust in design, implementation and teacher empowerment remain crucial. International examples offer potential directions for greater flexibility, community partnership, and lifelong learning. The journey of curriculum development is ongoing. Nepal's case proves that education reform is both universal and contextually grounded.

Actionable Implications for CDC Nepal

The school-level curriculum in Nepal stands at a pivotal moment where reform must prioritize flexibility, teacher autonomy, and contextual relevance. By empowering curriculum designers to adapt plans based on local realities, and ensuring that curricular content is regularly updated to reflect global developments, the system can better serve diverse learning communities. Key emphasis should also be placed on integrating soft skills such as critical thinking, collaboration, and digital literacy through robust ICT infrastructure and professional development. Inclusive and adaptive materials must reach students from varying backgrounds, while assessment practices should shift toward formative and project-based methods that truly reflect student understanding. To create meaningful and lasting change, curriculum reform

should focus on coherence, depth, and real-world relevance through localizing science and math content and diversifying language texts. A greater balance of formative and summative assessments, including competency-based item banks will help move away from high-stakes exams. Drawing inspiration from global models such as Finland, Brazil, and Canada, Nepal can strengthen interdisciplinary, learner-centered approaches by embracing Universal Design for Learning and clearer knowledge progressions. This evolution will require ongoing research, community participation, and teacher-led innovation to craft a curriculum that is inclusive, adaptive, and deeply rooted in both local culture and global citizenship. Therefore, the key findings imply that CDC would be informed to:

Related to Curriculum Plan and Policy

- Strengthen content descriptors in Mathematics, Science, and language to reflect deeper competencies and clarity.
- Integrate indigenous knowledge more consistently across subjects to reinforce Nepal's cultural relevance.
- Recognize and formalize peer, self, and parent as well as teacher classroom evaluation within national assessment guidelines.
- Promote contextual second language instruction that reflects local identity while embracing global communication needs.
- Redesign high-stakes exams to include feedback mechanisms that inform learning progression.
- Embed constructivist and socio-cultural approaches into curriculum frameworks and incorporate soft skills into practices.
- Decentralize curriculum adaptation processes to empower teachers and schools with contextual flexibility.
- Ensure coherence in learning progression by mapping developmental milestones and scaffolding content transitions across grades.
- Consider allowing greater local autonomy and flexibility for schools to adapt content based on local needs.
- Enhance the structural emphasis on moral education and civic responsibility within the curriculum, drawing insights from countries like Japan, China, and South Korea, which prioritize these aspects.
- Investigate integrating principles of Gross National Happiness, which focuses deeply on emotional well-being and ethical values, to enrich Nepal's educational foundation.
- Maintain the explicit emphasis on "mathematical knowledge, skills, thinking and attitude and application in daily life" at the basic level, as this detailed articulation is a notable difference.
- Explore integrating innovative methods like the Concrete-Pictorial-Abstract (CPA) model used in Singapore and Finland's emphasis on conceptual understanding to improve comprehension and retention.

- Explicitly embed mathematical literacy within broader social, environmental, or entrepreneurial competencies, helping learners connect abstract skills to everyday situations, as seen in Finland, Australia, South Korea, South Africa, and Brazil.
- Explore incorporating outdoor learning experiences into the Mathematics curriculum, a practice common in Denmark and Australia but less so in South Asian systems like Nepal.
- Strengthen the continuous assessment system by incorporating more formative feedback and better embedding pedagogical strategies like the CPA method to improve understanding and retention, especially among diverse learners.
- Broaden assessment approaches and embed math within broader societal and developmental contexts to align more globally.
- Explore connecting Science learning with cultural and emotional development, drawing inspiration from approaches in Bhutan and Japan.
- Integrate inquiry skills, ethical reasoning, and sustainability more deeply into the Science content, aligning with emphases in Finland, Australia, and South Korea.
- Explicitly include ethical reasoning and Science-society links to enrich competencies and help students connect Science to human contexts, following the lead of Australia and South Africa.
- Prioritize modeling and real-life problem-solving in Science assessments, mirroring Brazil and Tanzania.
- Foster inquiry-based, cross-disciplinary learning and link Science content to problem-solving and civic engagement in assessments, following Canada and the USA.
- Implement assessments that measure students' curiosity and inquiry skills from early stages, as seen in Japan and Singapore.
- Create national or provincial frameworks to guide inquiry, data analysis, and hands-on investigations in assessments.
- Maintain the unique emphasis on collaborative learning and expressive skills ("Express opinions, ideas and feelings using simple English.") from the Basic level.
- Explore framing language competencies to include creativity, academic writing, and cultural fluency.
- Continue developing elaborate and context-specific thematic content, which provides a richer, more practical linguistic context.
- Align learning materials with real-world communication needs and cultural relevance, incorporating engaging texts, age-appropriate literature, and visual/audio resources, and integrating themes related to health, environment, technology, and social values.
- Consider embedding advanced language skills from the start, as practiced in Singapore and Malaysia.
- Increase the integration of ICT tools and digital resources like multimedia lessons, virtual labs, or smart boards, similar to India, China, Singapore, and Malaysia.

Related to Further Research Works

- Conduct research to innovate a curriculum development model to guide curriculum development team.
- Carry out evaluation research to examine the relevance and practicability of the competencies, learning outcomes, strategies, and assessment systems to improve curriculum planning.
- Conduct research on the effects of granting greater local autonomy in curriculum adaptation on student learning outcomes and teacher professional development in Nepal.
- Study the effectiveness of explicitly including ethical reasoning and Science-society links in Science and Mathematics curricula on student understanding, critical thinking, and civic engagement.
- Conduct studies to evaluate the effectiveness of incorporating innovative pedagogical strategies (e.g., CPA method in math, outdoor learning, and performance-based assessments) in Nepal's classrooms across different subjects.
- Research best practices and develop a framework for systematically integrating critical transversal competencies (creativity, digital literacy, collaboration, global awareness) across all subjects in Nepal's curriculum.
- Conduct research on how to effectively embed mathematical and scientific literacy within broader social, environmental, and entrepreneurial competencies to prepare students for global citizenship and local innovation.

References

- Altbach, P. G., & Mazrui, A. A. (Eds.). (1994). *The political economy of higher education in Africa*. Heinemann.
- Batista, F. C. A. (2020). English language teaching in Brazil: A Gap in policy, problems in practice. *Canadian Center of Science and Education*. 3(8), 135-140.
- Bereday, G. Z. F. (1964). *Comparative method in education*. Holt, Rinehart and
- Bowen, G. A. (2009). *Document analysis as a qualitative research method*.
- Bray, M., Adamson, B., & Mason, M. (2014). *Comparative education research*.
- Broadfoot, P. (2000). *The politics of curriculum and assessment*. In J. L. Marshall (Ed.), *Handbook of research on curriculum* (pp. 165-188). Macmillan. (Discusses the political nature of curriculum decision-making).
- Central Board of Secondary Education (CBSC) (2025). *Senior secondary school curriculum 2025-26*. CBSC.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.
- Curriculum Development Center (2076BS). *Basic level curriculum grade 1-3*.
<https://moecdc.gov.np/en/curriculum>
- Curriculum Development center (2077BS). *Basic education curriculum (Grade 6-8) compulsory subjects*. <https://moecdc.gov.np/en/curriculum>
- Curriculum Development Center (2078). *Secondary education curriculum (Grade 9-10) compulsory subjects* <https://moecdc.gov.np/en/curriculum>
- Curriculum development Center (2078BS). *Basic education curriculum (Grade 4-5) compulsory subjects*. <https://moecdc.gov.np/en/curriculum>
- Curriculum Development Center (2079BS). *National curriculum framework* (2 ed.).
<https://moecdc.gov.np/en/policies-guidelines>
- Curriculum Development Center (2076BS). *National curriculum framework*. Bhaktapur
- Curriculum Planning and Development Division (2008). *English language syllabus 2010 primary & secondary*. Ministry of Education, Singapore.
- Curriculum Planning and Development Division (2020). *English language syllabus primary foundation English secondary normal (Technical) course*. Ministry of Education, Singapore.
- Curriculum Planning and Development Division (2020). *English language syllabus secondary express course normal (Academic) course*. Ministry of Education, Singapore
- Curriculum Planning and Development Division (2022). *Biology syllabus upper secondary express course*. Ministry of Education, Singapore.
- Curriculum Planning and Development Division (2022). *Science teaching & learning syllabus primary three to six standard / foundation*. Ministry of Education, Singapore.
- Curriculum Planning and Development Division (2023). *English language syllabuses primary*. Ministry of Education, Singapore.

- Curriculum Planning and Development Division (2023). *Mathematics syllabuses secondary: One to four express course normal (Academic) course*. Ministry of Education, Singapore.
- Curriculum Planning and Development Division (2023). *Mathematics syllabus secondary One to four normal (technical) course*. Ministry of Education, Singapore.
- Curriculum Planning and Development Division (2024). *Science syllabus lower secondary express course normal (Academic) course*. Ministry of Education, Singapore.
- Darling-Hammond, L. (2010). *The flat world and education: How America's*
- Dewey, J. (1938). *Experience and Education*. Macmillan.
- Directorate of Primary Education (2015). *Third primary education development program (PEDP 3)-revised*. Dhaka: Ministry of Primary and Mass Education (MoPME), Government of Bangladesh. Retrieved from [http://dpe.portal.gov.bd/sites/default/files/files/dpe.portal.gov.bd/page/093c72ab_a76a_4b67_bb19_df382677bebe/PEDP-3Brief\(Revised\).pdf](http://dpe.portal.gov.bd/sites/default/files/files/dpe.portal.gov.bd/page/093c72ab_a76a_4b67_bb19_df382677bebe/PEDP-3Brief(Revised).pdf)
- Directorate of Primary Education. (2017). *Annual primary education census*. Dhaka. Retrieved from <http://www.dpe.gov.bd/site/publications/50b03c39-bde0-4c2f-a143-e13914cc8b7e/APSC-2017>
- Dupuy, C. (2020). *Converging regional education policy in France and Germany*. Springer International Publishing.
- European Commission (n. d.). Overview. *Eurypedia: Denmark*. <https://eurydice.eacea.ec.europa.eu/eurypedia/denmark/overview>
- Finnish National Agency for Education (EDUFI) (2016). *National core curriculum for basic education 2014*. Helsinki: Next Print.
- Finnish National Agency for Education (EDUFI) (2019). *National core curriculum for general upper secondary schools*. Helsinki
- Gay, G. (2018). *Culturally responsive teaching: Theory, research, and practice* (3rd ed.). Teachers College Press.
- European Commission (2025). Organization of the education system and of its structure. *Germany*. <https://eurydice.eacea.ec.europa.eu/eurypedia/germany/organisation-education-system-and-its-structure>
- Goodson, I. F. (1994). *The changing curriculum: studies in social history*. Peter Lang.
- Helsinki City Education Division (2020). *Local curriculum for basic education*.
- American International School of Johannesburg (n. d.). *High school course descriptions 2013 – 2014. Accredited by the southern association of colleges and schools*. www.aisj-jhb.com
- Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative health research*, 15(9), 1277-1288. <https://doi.org/10.1177/10497323052766>
- Kantelinen, R., & Pollari, P. (2018). Language education in Finnish upper secondary schools. *Journal of Language Teaching and Research*, 9(2), 383–391.
- Ministry of Education Malaysia (2023). *Education Blueprint 2013-2025*. Kementerian pendidikan Malaysia. www.moe.gov.my

- Ministry of Education, Science and Technology Nepal (2022). School education sector plan Nepal (2022-2032). <http://elibrary.moest.gov.np:8080/handle/123456789/198>
- Ministry of Children and Education (2019). København: The Danish Ministry of Education. Retrieved 20. 03. 2019 from: <https://eng.uvm.dk/upper-secondary-education/national-upper-secondary-education-programmes/the-higher-preparatory-examination--hf->
- Ministry of Education (2020). *National curriculum framework for secondary education in Sri Lanka*. https://educationforum.lk/wp-content/uploads/2021/08/MoE_Framework_SecondaryEducation_2020Nov.pdf
- Ministry of Education (2020). *Sri Lanka: General education sector development plan*. <https://moe.gov.lk/wp-content/uploads/2021/11/General-Education-Sector-Development-Plan-2021-2025-1.pdf>
- Ministry of Education and Skills Development (2023). *Competency Based Assessment Test Item Development Guide for Schools*. Department of Curriculum and Professional Development & Bhutan Council for School Examinations and Assessment
- Ministry of Education and Skills Development (2023). *National Student–Learning Assessment Framework: Assessment, Evaluation, and Reporting*. Department of School Education.
- Ministry of Education, Brasil (2017). *A Base Nacional Comum Curricular: Educação Básica* (The National Common Curricular Base: Basic Education)
- Ministry of Education. (2007). *Education structure of Bangladesh*. Retrieved 27 Apr 2020, from http://old.moedu.gov.bd/index.php?option=com_content&task=view&id=4339&Itemid=4354
- Mykrä, N. (2023). Ecological Sustainability and Steering of Finnish Comprehensive Schools. In: Thrupp, M., Seppänen, P., Kauko, J., Kosunen, S. (eds) *Finland's Famous Education System*. Springer. https://doi.org/10.1007/978-981-19-8241-5_6
- National Council of Educational Research and Training (NCERT), India. (2023). *National Curriculum Framework*.
- National Education Commission (2014). *Study on curriculum development in general education in Sri Lanka*. <https://nec.gov.lk/wp-content/uploads/2016/04/1-Final-6.pdf>
- Ontario (n.d.). Curriculum and Resources <https://www.dcp.edu.gov.on.ca/en/curriculum#elementary>
- Opertti, R., Kang, T., & Magni, G. (2018). *The role of curriculum in fostering*
- Organization for Economic Co-operation and Development (2020). *Education policy outlook: Denmark*. Paris: OECD Publishing
- Ornstein, A. C., & Hunkins, F. P. (2018). *Curriculum: Foundations, principles, and issues*. Pearson Education Limited.
- Phillips, D., & Ochs, K. (2004). *Education in Germany*. Routledge. (Explores the structure and aims of German education, including its vocational emphasis).
- Print, M. (2020). *Curriculum development and design*. Routledge.
- Royal Education Council (2018). *Royal Education Council Operational Framework (RECOF) 2018*. Royal Government, Ministry of Education.

- Royal Government of Bhutan, Ministry of Education (2022). *English curriculum framework (Class PP-XII)*. Department of Curriculum and Professional Development.
- Royal Government of Bhutan, Ministry of Education (2023). *Mathematics Curriculum Framework (Class PP-XII)*. Department of School Education, Ministry of Education and Skills Development.
- Royal Government of Bhutan, Ministry of Education (2025). *Science Curriculum Framework (Class PP-XII)*. Department of School Education, Ministry of Education and Skills Development.
- Sahlberg, P. (2021). *Finnish Lessons 3.0: What Can the World Learn from Educational Change in Finland?* Teachers College Press.
- Secretariat of the Standing Conference of Ministers of Education and Cultural Affairs of the Lander in the Federal Republic of Germany (2019). *The education system in the Federal Republic of Germany 2019/2020: A description of the responsibilities, structures and developments in education policy for the exchange of information in Europe*
https://www.kmk.org/fileadmin/Dateien/pdf/Eurydice/Bildungswesen-engl-pdfs/organisation_and_governance.pdf
- South Asia Human Development Sector (2011). *Strengthening Science education in Sri Lanka*.
<https://fid4sa-repository.ub.uni-heidelberg.de/3445/1/Science%20Education%20Sri%20Lanka.pdf>
- Taba, H. (1962). *Curriculum Development: Theory and Practice*. Harcourt, Brace & World.
- Takei, Y., & Ninomiya, S. (2018). *The Japanese education system*. Routledge.
- Ministry of Children and Education (2020). København: *The Danish Ministry of Education*. Retrieved 09. 01. 2020 from the Web site:<https://eng.uvm.dk/general-overview/overview-of-the-danish-education-system>
- Zhang, Y., & Amp; Wildemuth, B. M. (2009). *Qualitative analysis of content*.

Appendices

Appendix A: Country Profile

Nepal

Nepal is a landlocked country situated in South Asia. It lies between latitudes 26° and 31°N and longitudes 80° and 89°E and bordered by China to the north and India on the other three sides. Despite its ordinary size, Nepal possesses extraordinary geographic diversity ranging from the tropical lowlands of the Terai to the high peaks of the Himalayas, including Mount Everest. This topography gives rise to a wide range of climates, from subtropical in the south to alpine and arctic in the north, with five distinct seasons: spring, summer, monsoon, autumn, and winter. Nepal is rich in water resources, with major river systems like the Koshi, Gandaki, and Karnali originating in the Himalayas and flowing southward which shape both the landscape and livelihoods. Culturally, Nepal is a mosaic of over 125 ethnic groups and more than 120 languages, with Hinduism and Buddhism deeply influencing its festivals, music, architecture, and daily life. In education, Nepal has made significant strides, achieving a primary school net enrollment rate of 97%. Many challenges remain in quality, equity, and infrastructure, especially in rural and marginalized communities. This blend of natural grandeur, cultural richness, and developmental aspirations makes Nepal a uniquely compelling nation.

India

India, located in South Asia, is the seventh-largest country in the world by area. It stretches from the snow-capped Himalayas in the north to the tropical shores of the Indian Ocean in the south. Geographically, it lies between latitudes 8°4' and 37°6'N and longitudes 68°7' and 97°25'E. It has been bordered by Pakistan, China, Nepal, Bhutan, Bangladesh, and Myanmar, with coastlines along the Arabian Sea and Bay of Bengal. Its diverse topography gives rise to a wide range of climates ranging from alpine in the Himalayas to arid in the northwest and tropical in the south in four different main seasons: winter, summer, monsoon, and post-monsoon. India has several major rivers, including the Ganges, Brahmaputra, and Indus in the north, and the Godavari, Krishna, and Kaveri in the south. They are vital for agriculture, culture, and daily life. Culturally, India is the mosaic of over 1,600 languages and numerous religions, with Hinduism, Islam, Christianity, Sikhism, Buddhism, and Jainism shaping its festivals, arts, and social customs. In education, India has made significant progress, achieving near-universal enrollment at the primary level and expanding access to secondary and higher education, though challenges remain in quality, equity, and infrastructure. This blend of geographic richness, cultural depth, and developmental dynamism makes India a uniquely complex and fascinating nation.

Bangladesh

Bangladesh is located in South Asia, is a low-lying country bordered by India on the west, north, and east, Myanmar to the southeast, and the Bay of Bengal to the south. It stretches approximately 148,460 square kilometers. It lies within the fertile Ganges-Brahmaputra-Meghna Delta making it one of the most densely populated countries in the world. The climate is predominantly tropical, with a hot, humid summer, a monsoon season from June to October, and a mild, dry winter. Bangladesh is crisscrossed by over 700 rivers, with the Ganges, Brahmaputra, and Meghna forming the backbone of its hydrological system, supporting agriculture,

transportation, and livelihoods. Culturally, Bangladesh is a tapestry woven from Islamic, Hindu, Buddhist, and indigenous traditions, reflected in its music, dance, festivals, and literature. Bengali is the official language, and Islam is the predominant religion. In education, Bangladesh has made tremendous progress, achieving near-universal primary enrollment and increasing female participation, though challenges remain in quality, dropout rates, and equitable access, especially in rural and marginalized communities.

Bhutan

Bhutan is a small landlocked country in the Eastern Himalayas and lies between China to the north and India to the south, east, and west, covering approximately 38,394 square kilometers. Its topography ranges from subtropical lowlands in the south to alpine highlands in the north, with elevations rising from 200 meters to over 7,500 meters. It has Gangkhar Puensum which is the world's highest unclimbed peak. This variation creates a diverse climate: hot and humid in the southern Duars, temperate in central valleys, and cold alpine conditions in the north. Bhutan is covered by four major river systems including Drangme Chhu, Wang Chhu, Mo Chhu, and Torsa Chhu, all originating in the Himalayas and flowing southward into India, supporting agriculture, hydropower, and biodiversity. Culturally, Bhutan is deeply rooted in Vajrayana Buddhism which shapes its festivals, architecture, and daily life, while traditional dress, masked dances, and monastic rituals remain integral to its identity. The country emphasizes Gross National Happiness over GDP, and its education system reflects this ethos, blending modern curricula with cultural values. Bhutan has achieved near-universal primary enrollment, though challenges persist in access, quality, and equity, particularly in remote areas.

Sri Lanka

The Democratic Socialist Republic of Sri Lanka is a tropical island nation in South Asia and located southeast of the Indian subcontinent and surrounded by the Indian Ocean. It covers approximately 65,610 square kilometers with diverse landscapes ranging from the central highlands with peaks like Pidurutalagala (2,524 meters) to lowland plains and a scenic coastal belt. The country experiences a tropical climate influenced by two monsoons: the southwest monsoon (May–September) and the northeast monsoon (December–February), resulting in regional variations in rainfall and temperature. Sri Lanka has over 100 rivers, with the Mahaweli River being the longest, vital for irrigation and hydropower. Culturally, it is a rich mosaic shaped by Sinhalese and Tamil traditions, Theravāda Buddhism, Hinduism, colonial legacies, and other festivals like Vesak and Deepavali. The country has a high literacy rate of over 90%. It possesses its long-standing commitment to free education, though disparities in quality and access persist, especially in rural areas. This blend of natural beauty, cultural depth, and educational progress makes Sri Lanka a unique nation in the region.

China

China is the world's third-largest country by area located in East Asia and stretches in a vast territory from the Pacific coastline in the east to the high plateaus of Central Asia in the west, and from the subarctic north to the tropical south. This immense geographic range gives rise to a remarkably diverse climate ranging subarctic in the northeast, arid in the northwest, temperate in the central plains, and tropical in the far south. China is crisscrossed by major rivers that have shaped its civilization for millennia, including the Yangtze which is Asia's longest river and called the Yellow River and known as the cradle of Chinese civilization. Culturally, China is one of the world's oldest continuous civilizations, deeply influenced by Confucianism,

Taoism, and Buddhism, with rich traditions in art, literature, philosophy, and festivals like the Lunar New Year and Mid-Autumn Festival. In education, China has achieved near-universal basic education and becoming a global leader in Science and engineering graduates, though disparities remain between urban and rural areas. This blend of geographic vastness, cultural depth, and educational ambition makes China a dynamic and influential presence on the global stage.

Singapore

Singapore, a sovereign city-state in Southeast Asia, is located at the southern point of the Malay Peninsula. It covers approximately 137 kilometers north of the Equator. Despite its compact size of around 735 square kilometers, it has a highly urbanized yet green environment, with over 60 surrounding islets complementing the main island. The country experiences a tropical rainforest climate including hot, humid, and rainy year-round with average temperatures hovering around 27–28°C and frequent afternoon thunderstorms due to its equatorial position. While Singapore lacks long rivers. It possesses historically significant waterways like the Singapore River, Kallang River, and Rochor River. They have been central to its development and are now integrated into its extensive reservoir and drainage systems. Culturally, Singapore is a conglomeration of Chinese, Malay, Indian, and Eurasian influences, reflected in its festivals, architecture, and multilingual society, where English, Mandarin, Malay, and Tamil are official languages. Its education system is globally acclaimed for academic excellence and equity, with near-universal literacy and strong performance in international assessments, while also evolving to emphasize creativity, inclusivity, and lifelong learning.

Malaysia

Malaysia is a Southeast Asian uniquely split between two main regions. The peninsular Malaysia located on the southern point of the Malay Peninsula, and East Malaysia situated on the northern part of Borneo Island. It shares land borders with Thailand, Indonesia, and Brunei, and surrounded by the South China Sea. the Malaysia's equatorial climate brings year-round warmth, high humidity, and abundant rainfall, caused by the southwest and northeast monsoons. Its terrain ranges from coastal plains to forested highlands with Mount Kinabalu (4,095 meters) as its highest peak. The country is rich in river systems including the Rajang and Kinabatangan in East Malaysia and the Pahang and Perak rivers in the peninsula which are vital for agriculture, transport, and biodiversity. Culturally, Malaysia is a dynamic mosaic of Malay, Chinese, Indian, and indigenous traditions reflected in its festivals, languages, and religious practices. The education system, overseen by the Ministry of Education, offers free primary and secondary schooling and has achieved a literacy rate exceeding 95%, though disparities in quality and access persist between urban and rural areas. This blend of geographic diversity, cultural richness, and educational ambition makes Malaysia a compelling and multifaceted nation.

Vietnam

Vietnam, located on the eastern edge of the Indochinese Peninsula in Southeast Asia, shares land borders with China to the north, Laos and Cambodia to the west and has a long eastern coastline along the South China Sea. It spans approximately 331,000 square kilometers, the country features a striking S-shape that stretches over 1,600 kilometers from north to south. Its diverse topography includes the fertile Red River Delta in the north, the central highlands, and the expansive Mekong Delta in the south. Vietnam's climate varies by region. The north experiences four distinct seasons with a humid subtropical climate, while the south has a tropical

monsoon climate with wet and dry seasons. The country is rich in waterways with major rivers like the Red River, Mekong, and Dong Nai playing vital roles in agriculture, transport, and daily life. Culturally, Vietnam is a blend of indigenous traditions and external influences, particularly from China and France, reflected in its Confucian values, Buddhist temples, colonial architecture, and other festivals like Tet. Education is highly valued, with a state-run system that has achieved near-universal literacy and strong primary enrollment, though challenges remain in rural access, quality, and higher education reform.

Japan

Japan is an island nation in East Asia which stretches in a northeast-southwest arc along the Pacific Ocean, lying between latitudes 20° and 45°N and longitudes 122° and 153°E. It comprises over 14,000 islands. The four main ones are Honshu, Hokkaido, Kyushu, and Shikoku accounting for the majority of its landmass. Japan's terrain is predominantly mountainous and volcanic, giving rise to a diverse climate: from humid continental in the north to subtropical and even tropical in the south. The country experiences four distinct seasons with a rainy season in early summer and frequent typhoons in late summer and autumn. Japan's rivers, though relatively short and swift due to the rugged topography, are vital for agriculture and hydroelectric power. The Shinano, Tone, and Ishikari are among the longest. Culturally, Japan blends ancient traditions with modern innovation rooted in Shinto and Buddhist practices, yet globally influential through its art, cuisine, literature, and pop culture. Its education system is highly structured and competitive having near-universal literacy and strong performance in international assessments, though it faces challenges such as demographic shifts and rural-urban disparities. This fusion of natural beauty, cultural depth, and educational excellence makes Japan a uniquely dynamic and resilient society.

South Korea

South Korea is officially the Republic of Korea located in East Asia on the southern half of the Korean Peninsula and bordered by North Korea to the north, the Yellow Sea to the west, the Sea of Japan (East Sea) to the east, and the East China Sea to the south. It covers approximately 100,000 square kilometers. This country is predominantly mountainous, with the Taebaek and Sobaek ranges shaping its rugged terrain. The fertile lowlands lie along the coasts and river basins. South Korea experiences a temperate climate with four distinct seasons—cold, dry winters and hot, humid summers—heavily influenced by the East Asian monsoon. Major rivers such as the Nakdong (the longest), Han, and Geum originate in the mountains and are vital for agriculture, urban water supply, and hydroelectric power. Culturally, South Korea blends deep-rooted Confucian traditions with dynamic modern influences that is evident in its reverence for elders, festivals, and global cultural exports like K-pop and Korean cinema. Its education system is highly competitive and structured, having near-universal literacy and strong international rankings, though it faces ongoing debates around student well-being and academic pressure. This fusion of natural beauty, cultural richness, and educational ambition defines South Korea's unique national character.

South Africa

South Africa is located at the southernmost point of the African continent, is bordered by Namibia, Botswana, Zimbabwe, Mozambique, and Eswatini, while entirely surrounding the enclave of Lesotho. It spans over 1.2 million square kilometers and has a strikingly diverse landscape ranging from the arid Kalahari Desert and the fertile High plateau to the dramatic

Drakensberg Mountains and a coastline stretching more than 2,800 kilometers along both the Atlantic and Indian Oceans. This varied topography gives rise to a wide range of climates: Mediterranean in the southwest, subtropical along the east coast, and semi-arid to arid in the interior. South Africa's major rivers include the Orange, the Limpopo, and the Vaal which are vital for agriculture, hydroelectric power, and water supply. Culturally, the country is a mosaic of traditions, with 12 official languages and a population that includes Zulu, Xhosa, Afrikaans, English, and many other ethnic groups, each contributing to a rich heritage of music, dance, and festivals. In education, South Africa has achieved near-universal literacy and offers free primary and secondary schooling, though it continues disparities in quality and access, particularly in rural and underserved communities. This blend of natural beauty, cultural depth, and developmental complexity makes South Africa a uniquely dynamic nation.

Tanzania

Tanzania is located in East Africa just south of the Equator and bordered by eight countries including Kenya, Uganda, Rwanda, and Mozambique and has a 1,424-kilometer coastline along the Indian Ocean. It spans over 945,000 square kilometers and its landscape is strikingly diverse, featuring the towering Mount Kilimanjaro (Africa's highest peak), the vast Serengeti plains, and the Great Rift Valley lakes such as Victoria, Tanganyika, and Nyasa. This varied topography gives rise to a range of climates from tropical along the coast, temperate in the highlands, and semi-arid in the interior, with distinct wet and dry seasons. Tanzania has several major rivers, including the Rufiji, Ruvuma, Pangani, and Great Ruaha which are vital for agriculture, hydropower, and biodiversity. Culturally, the country is a mosaic of over 120 ethnic groups, unified by Swahili as the national language and enriched by traditions from the Maasai, Chaga, Sukuma, and many others. The education system has expanded significantly in recent decades, achieving near-universal primary enrollment and improving literacy rates, though challenges persist in secondary access, quality, and rural equity. This blend of natural grandeur, cultural richness, and developmental momentum makes Tanzania a compelling and dynamic nation.

Brazil

Brazil is the largest country in South America. It occupies nearly half of the continent's landmass and shares borders with every South American nation except Chile and Ecuador. Stretching from the equator to the Tropic of Capricorn, it spans diverse landscapes ranging from the dense Amazon rainforest in the north to the subtropical Pampas in the south. This vast territory gives rise to a range of climates including equatorial in the Amazon basin, tropical in the central regions, and temperate in the south. Brazil has some of the world's most significant rivers, including the Amazon, the planet's largest by discharge, the Paraná, São Francisco, and Tocantins all vital for biodiversity, transportation, and hydroelectric power. Culturally, Brazil is a fusion of Indigenous, African, and Portuguese influences, reflected in its language (Portuguese), music (like samba and bossa nova), and globally renowned festivals such as Carnival. In education, Brazil has expanding access, with near-universal primary enrollment, but continues to face challenges in quality, equity, and higher education attainment, particularly in rural and underserved areas. This blend of ecological richness, cultural dynamism, and developmental complexity makes Brazil a uniquely influential nation on the global stage.

United Kingdom (UK)

The United Kingdom (UK) is situated off the northwestern coast of mainland Europe. It comprises four constituent countries including England, Scotland, Wales, and Northern Ireland and spans approximately 244,000 square kilometers across the islands of Great Britain and the northeastern part of Ireland. Its geography ranges from the rugged Scottish Highlands and Welsh mountains to the rolling plains of England and the low-lying areas of Northern Ireland. The UK experiences a temperate maritime climate, characterized by mild temperatures, frequent rainfall, and cloudy skies with regional variations influenced by proximity to the Atlantic Ocean. Major rivers such as the Severn (the longest), Thames, Trent, and Clyde play vital roles in transportation, agriculture, and urban development. Culturally, the UK is a rich tapestry shaped by centuries of history, global influence, and internal diversity—home to world-renowned literature, music, theatre, and traditions rooted in English, Scottish, Welsh, and Irish heritage. Its education system is globally respected with near-universal literacy and a strong emphasis on academic achievement, though it continues to address disparities in access and outcomes across regions and socioeconomic groups. This blend of natural variety, cultural depth, and educational excellence makes the UK a dynamic and influential nation on the world stage.

The United States of America (USA)

The United States of America (USA) is located in North America and bordered by Canada to the north, Mexico to the south, the Atlantic Ocean to the east, and the Pacific Ocean to the west, with Alaska and Hawaii extending its reach into the Arctic and Pacific regions respectively. Spanning over 9.8 million square kilometers, the country encompasses a vast array of natural landscapes from the Rocky Mountains and Great Plains to the Mississippi River basin and coastal lowlands. This geographic diversity gives rise to a wide range of climates: arid deserts in the southwest, humid subtropical zones in the southeast, Mediterranean conditions in California, and subarctic regions in Alaska. The USA has some of the world's most iconic rivers, including the Mississippi, Missouri, Colorado, and Columbia which have historically supported agriculture, trade, and settlement. Culturally, the United States is a dynamic mosaic shaped by Indigenous heritage, waves of immigration, and global influence, with contributions from African, European, Latin American, and Asian traditions reflected in its music, literature, and holidays. Its education system, though decentralized and governed at the state level, is one of the most expansive in the world, with near-universal literacy, widespread access to primary and secondary schooling, and a globally influential higher education sector that includes many of the world's top universities. This blend of geographic scale, cultural richness, and educational ambition defines the USA's complex and far-reaching identity.

Canada

Canada is the second-largest country in the world by total area located in the northern part of North America. It stretches from the Atlantic Ocean in the east to the Pacific Ocean in the west, and northward into the Arctic Ocean. It shares the world's longest land border with the United States and encompasses a vast and varied landscape that includes the Rocky Mountains. This geographic diversity gives rise to a wide range of climates ranging from arctic in the north, subarctic and continental in the interior and temperate along the coasts. Canada has several major rivers including the Mackenzie (its longest), the St. Lawrence, the Fraser, and the Columbia, which are vital for transportation, hydroelectric power, and ecological balance. Culturally, Canada is a mosaic shaped by Indigenous heritage, French and British colonial roots, and waves of immigration, making it one of the world's most multicultural societies. Its official languages are English and French, and its cultural identity is reinforced through public institutions like the

CBC and National Film Board. In education, Canada consistently ranks among the top globally, with near-universal literacy, high secondary school completion rates, and a tertiary education attainment rate exceeding 57%. The highest among OECD countries blend natural grandeur, cultural richness, and educational excellence defines Canada's global reputation as a progressive and inclusive nation.

Australia

Australia is officially the Commonwealth country which is a vast island nation and continent located in the Southern Hemisphere between the Indian and Pacific Oceans. It spans approximately 7.7 million square kilometers, making it the sixth-largest country in the world, and lies between latitudes 10° and 44°S and longitudes 113° and 154°E. Its geography is remarkably diverse features including arid deserts, tropical rainforests, temperate woodlands and alpine regions. The climate varies widely ranging from tropical in the north to temperate in the southeast and arid in the interior. Much of the continent experiences low annual rainfall. Major rivers such as the Murray, Darling, and Murrumbidgee are crucial for agriculture and water supply, particularly in the southeast. Culturally, Australia is a blend of Indigenous heritage and multicultural influences, shaped by waves of immigration and a strong British colonial legacy. English is the dominant language and the country celebrates a rich tapestry of traditions from Aboriginal Dreamtime stories to modern festivals and global pop culture. In education, Australia has a high literacy rate and a well-developed system with compulsory schooling and a strong tertiary sector that attracts international students. However, disparities in access and outcomes persist, particularly between urban and remote communities. This fusion of natural extremes, cultural depth, and educational ambition defines Australia's unique national character.

Denmark

Denmark is a Nordic country in Northern Europe. It occupies the Jutland Peninsula and an archipelago of over 440 named islands. It is bordered by Germany to the south and surrounded by the North and Baltic Seas. Its landscape is predominantly flat with gently rolling plains and sandy coastlines contributing to a temperate maritime climate characterized by mild winters, cool summers, and frequent rainfall throughout the year. The country has several rivers, with the Gudenå being the longest and the Skjern both playing important roles in agriculture and recreation. Danish culture is deeply rooted in egalitarian values, community trust, and a strong welfare state, with traditions like *hygge* (a sense of cozy contentment), several festivals and a rich legacy in literature, design, and cinema. Education is free and compulsory up to age 16, with Denmark having near-universal literacy and a strong emphasis on lifelong learning, supported by a mix of public and private institutions and a high level of adult participation in continuing education (European Commission, n. d.). This blend of natural charm, cultural depth, and educational commitment makes Denmark a model of balanced development and social cohesion.

Germany

Germany is located in Central Europe and shares borders with nine countries including France, Poland, Austria, and the Netherlands—and stretches from the North and Baltic Seas in the north to the Alps in the south. Its landscape is remarkably varied, encompassing the flat North German Plain, the forested Central Uplands, and the mountainous Bavarian Alps, with the Zugspitze as its highest peak at 2,962 meters. Germany experiences a temperate seasonal climate with mild to cold winters and warm summers, and regional variations influenced by maritime and continental air masses. The country has several major rivers, including the Rhine, Danube,

and Elbe, which have historically shaped its economy, culture, and settlement patterns. Culturally, Germany is a powerhouse of intellectual and artistic heritage, home to figures like Goethe, Beethoven, and Kant and is known for its regional diversity, strong traditions, and global influence in music, philosophy, literature, and design. Its education system is highly structured and vocationally oriented, offering free or low-cost access to higher education and having one of the world's most respected dual training systems, though regional disparities and integration challenges remain. This blend of geographic diversity, cultural richness, and educational rigor makes Germany a cornerstone of European identity and innovation.

Finland

Finland is a Nordic country in Northern Europe. It lies between latitudes 60° and 70°N and is bordered by Sweden to the west, Russia to the east, Norway to the north, and the Baltic Sea to the south. Known for its striking natural beauty, Finland has over 188,000 lakes and vast forests making it the most densely forested country in Europe. Its climate is predominantly temperate continental, with cold, snowy winters and mild summers, moderated by the Baltic Sea and the Gulf Stream. The country's major rivers include the Kemijoki, Tornionjoki, and Oulujoki, which support hydroelectric power and forestry. Culturally, Finland blends ancient traditions with modern Nordic values which are rooted in egalitarianism, nature reverence, and a strong sense of national identity, while celebrating both Finnish and Swedish heritage, as well as the indigenous Sámi culture in the north. Finland's education system is globally admired for its equity, minimal standardized testing, and emphasis on student well-being, with near-universal literacy and strong performance in international assessments, though recent years have seen efforts to address declining trends in reading and math proficiency. This fusion of natural serenity, cultural depth, and educational innovation defines Finland's unique national character.

Appendix B: Data Extraction Form/Instrument**Researcher's Name:****Country:** USA**Federal/State Level:** New York State**Name of Curriculum Development Unit/Office:****1. Theoretical/Philosophical Bases**

Nepal	Other country (i.e., USA)
1. Curriculum based on competencies	
2. Curriculum development in line with the concept of holistic child development	
3. Curriculum development in accordance with child-centered developmental methodology	
4. Curriculum development based on integrated principles	
5. Curriculum development based on inclusive principles	
6. Curriculum development based on the use of information, communication, and modern Technology	
7. Local need based curriculum development approach	
8. Developing a life-useful and work-oriented curriculum	
9. Participatory curriculum development	
10. Curriculum development based on flexibility (resilience) and diversity	
11. Curriculum development based on Nepali values and beliefs and Eastern knowledge	
12. Management of key areas of learning	
13. Curriculum development ensuring educational quality standards	
14. Curriculum development based on discovery and research	

Researcher's analytical review

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2. School Education Structure

Nepal			USA		
Level	Grade	Age	Level	Grade	Age
ECD		4 years			
Basic	Grade 1-3	5 years to 7 years			
	Grade 4-5	8 years to 9 years			
	Grade 6-8	10 years to 12 years			
Secondary	Grade 9-10	13 years to 14 years			
	Grade 11-12	15 years to 16 years			

Researcher's Analytical Review:

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3. General Competencies of School Education

Nepal	Other country
Early Childhood Education and Development (ECED)	
1. Use of language for expression and communication 2. Identification and daily use of nutritious food options 3. Following healthy habits and good social behavior and demonstrating models as needed 4. Adopting personal safety measures 5. Using thematic learning and creative thinking in the course of performing daily tasks 6. Involvement in holistic development activities and use of basic skills in them	

Researcher's Analytic Review

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Basic level (1-8)	
1. Ingraining with patriotism and national integration and demonstration of democratic value, attitude, and tendency in behavior 2. Development of language and communication skills and their creative, practical and appropriate use 3. Exchange of information and communication, analysis and proper use of information and Technology 4. Development of logical and applied math knowledge, skill, and attitude and their use 5. Curiosity and understanding towards scientific approach, facts, theory, and principles and use in practical life 6. Development of human value and faith and social quality and aware of civic duty 7. Understanding the relationship between population, environ conservation and sustainable development and contribution to their management 8. Development of physical fitness, healthy life style and life skills 9. Respect of local and modern profession, occupation, and Technology and labor as well and application of useful soft skills 10. Protection and promotion of Nepali art, literature and culture and their practice 11. Having familiarity with national and international contexts and making understanding and acceptance of diversity, global fraternity, and co-existence 12. Recognition of the problems being faced in everyday life and their analysis and settlement	

Researcher's Analytic Review

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Basic (Grade 1-3)	
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1. Develop and apply basic language and communication skills 2. Develop and apply basic mathematical concepts and skills 3. Develop social and character (behavioral) qualities such as discipline, morality and self-reliance 4. Develop basic knowledge related to Science, environment, information Technology 5. Develop physical fitness, healthy habits and life skills 6. Develop interest in art and beauty and creativity 7. Develop respect and equality towards different castes, religions, languages, cultures and regions by getting acquainted with one's surroundings	
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Researcher's Analytic Review

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Basic (Grade 4-5)	
1. Development of patriotism and democratic values and customs; Development and practical application of basic linguistic and communication skills 2. Development and application of basic mathematical concepts and skills 3. Development of social values and character traits such as morality, discipline, ethics and self-reliance 4. Development of basic knowledge and skills related to Science, environment, information Technology 5. Development of physical fitness, healthy habits, hygiene and life skills 6. Development of interest in art and beauty, development of creative and critical skills 7. Development of respect and equality towards different castes, religions, languages, cultures and regions by getting acquainted with one's surroundings	

Researcher's Analytic Review

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Basic (Grade 6-8)	
1. Develop patriotism and a sense of national unity 2. Develop democratic values and culture and respect for diversity 3. Develop language and communication skills and their practical, creative and relevant use 4. Exchange of information and ideas, analysis and appropriate use of information Technology 5. Development and use of logical and practical mathematical knowledge, skills and attitudes 6. Curiosity and understanding of scientific concepts, facts, principles and rules and their application in practical life 7. Development of social and human values, beliefs and character and civic qualities such as morality, discipline, ethics, self-reliance 8. Understanding of the interrelationship between population, environmental protection and sustainable development and support in management 9. Development of physical fitness, healthy lifestyle and life skills 10. Respect for local and modern professions, businesses and Technology and labor and development of soft skills 11. Preservation and promotion of Nepali art, literature and culture and use of creativity 12. Understanding and accepting diversity, harmony and coexistence by being	

familiar with the national and international social and geographical environment	
13. Identification, analysis and solution of practical problems encountered in daily life	

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Secondary (Grades 9-12)	
1. To be a conscious citizen responsible for the promotion of the nation and nationality by adopting human values, norms and democratic culture 2. To play a role in building a civilized, cultured and egalitarian society by becoming familiar with the national and international environment and embracing diversity, harmony and coexistence 3. To use language skills in an appropriate, creative and respectful manner with confidence in daily activities as well as in the academic field 4. To learn effectively, think creatively and analytically and exchange ideas through social contact and communication 5. To develop a positive attitude towards learning and develop the habit of self-study and seeking knowledge and skills for personal development and fulfillment of needs 6. To understand and apply practical mathematical knowledge and skills and to use mathematical concepts, principles and logical skills in problem solving 7. To understand and use of practicable Mathematics knowledge 8. To use practical scientific knowledge, facts, theories and Technology appropriately 9. Acquire the necessary procedural skills for scientific discovery and research and use modern technologies in daily life 10. Demonstrate socially relevant behavior by using life skills by recognizing identity with the life world and behavior 11. Active participation in environmental protection and promotion and population management along with health awareness 12. Analyze natural and social phenomena, understand their causes and effects, and demonstrate positive behavior 13. Prepare confidently for the world of work with respect for labor 14. Develop and use technical knowledge, skills, attitudes, and professional and managerial abilities at the higher level 15. Develop a foundation for higher level studies	

Researcher's Analytic Review

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Secondary (Grades 9-10)	
1. Taking responsibility as a conscious citizen for the promotion of the nation and nationality by adopting human values, norms and democratic culture 2. Playing a role in building a civilized, cultured and egalitarian society by becoming familiar with the national and international environment and embracing diversity, harmony and coexistence 3. Using language skills appropriately and relevantly with confidence in daily activities 4. Effective learning, creative and analytical thinking and exchange of ideas through social contact and communication	

5. Using mathematical concepts, principles and logical skills in solving mathematical problems 6. Using life skills to identify with the life world and behavior and demonstrate socially relevant behavior 7. Active participation in environmental protection and promotion and population management with health awareness 8. Analysis of natural and social phenomena, understanding their impact and demonstrating positive behavior 9. Acquire the procedural skills necessary for scientific discovery and research and use modern technologies in daily life 10. Prepare for the world of work with respect for labor 11. Develop and use technical knowledge, skills, attitudes, and professional and managerial abilities	
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Researcher's Analytic Review

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Secondary (Grades 11-12)	
1. Adopting human values, norms and democratic culture and taking responsibility as conscious citizens for the promotion of the nation and nationality 2. Playing a role in building a civilized, cultured and egalitarian society by becoming familiar with the national and international environment and embracing diversity, harmony and coexistence 3. Using language and communication skills appropriately, creatively and relevantly with confidence in daily activities as well as in the academic field 4. Developing a positive attitude towards learning and developing the habit of self-study and seeking knowledge and skills for personal development and fulfillment of needs# 5. Developing life skills by identifying with life, livelihood and profession and socio-cultural behavior 6. Adopting a healthy lifestyle and playing a role in environmental protection and sustainable development 7. Analyzing natural and social phenomena, understanding their causes and effects and demonstrating positive behavior 8. Entering the world of work with confidence while respecting labor 9. Developing and applying technical knowledge, skills, attitudes, and professional and managerial abilities 10. Developing the subject-specific/methodological basis for higher-level studies	

Researcher's Analytic Review

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Curriculum structure, Subjects, Subject Level-Wise Competencies, and Their Content Areas

A. Curriculum Structure

A1. ECDE curriculum and components

S.N.	Areas of Skill	Skills	Total Teaching hours in a	Learning Facilitation	Assessment Approaches	Grading System

			year			
1.						
2.						

Researcher's Analytic Review

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A2. Basic level (grades 1-3)

S.N.	Activities/Subjects	Credit hours	Yearly working hours	Grading System
1				
2				
3				
4				
5				

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A3. Basic level (grades 4-5)

S.N.	Subject	Credit hours	Yearly working hours	Grading System
	Total			

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A4. Basic level (grades 6-8)

S.N.	Subject	Credit hours	Yearly working hours	Grading System

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A5. Secondary level (grades 9-10)

S.N.	Subject	Credit hours	Yearly working hours	Grading System
Total				

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A6. Secondary level (grades 11-12)

S.N.	Subjects	Grade 11		Grade 12		Grading System
		Credit hours	Yearly working hours	Credit hours	Yearly working hours	
1						
2						
3						
4						
5						
6						

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B. Selected Subjects and Their Components**Bm1. Mathematics, Basic (grades 1-3)**

Competencies	Content areas	Learning Facilitation	Assessment approaches

Researcher’s Analytic Review

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Bm2. Mathematics, Basic (grades 4-5)

Competencies	Content areas	Learning Facilitation	Assessment approaches

Researcher’s Analytic Review

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Bm3. Mathematics, Basic (grades 6-8)

Competencies	Content areas	Learning Facilitation	Assessment approaches

Researcher’s Analytic Review

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Bm4. Mathematics (Grades 9-10)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Bm5. Mathematics (Grades 11-12)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Bs1. Science (Grades 1-3)/integrated within Mero Serophero

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Bs2. Science (Grades 4-5)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Bs3. Science (Grades 6-8)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Bs4. Science (Grades 9-10)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Bs5. Science (Grades 11-12/Optional)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Bn1. Nepali (grades 1-3)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Bn2. Nepali (grades 4-5)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Bn3. Nepali (Grades 6-8)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Bn4. Nepali (Grades 9-10)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Bn5. Nepali (Grades 11-12)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Be1. English (Grades 1-3)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Be2. English (Grades 4-5)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Be3. English (Grades 6-8)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytical Review:

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Be4. English (Grades 9-10)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Be5. English (Grades 11-12)

Competencies	Content areas	Learning facilitation	Assessment approaches

Researcher's Analytic Review

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Curriculum Development and Implementation Process and Mechanism

Nepal	Other Country	Researcher's analytical review findings

4. Overall reflection of researcher on the analytical review of education/curriculum philosophical/theoretical bases, school education structure, general education competencies, subjects, subject-related competencies, contents, learning facilitations, assessment approaches, and curriculum implementation process to inform Curriculum Development Center of Nepal for improvement in school curriculum. Please critically assess them from the educational philosophical lenses i.e., structuralism, constructionism, theories, etc., reaching out beyond technical data/information analysis taking a position as a critical researcher for transformation of Nepal's school level curriculum.

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References

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Researcher's Name:

Appendix C: *Theoretical principles across all countries*

Country	Theoretical principles	Special Features
Nepal	Promote inclusive education for all learners Adopt competency-based learning standards Foster learner-centered pedagogical approaches Incorporate students' needs, interests, and abilities Encourage active participation and experiential learning Address socio-economic and cultural diversity Ensure equal access to quality education Emphasize practical knowledge, skills, and values Integrate ICT and innovative teaching methods Respect indigenous knowledge and local traditions Align curriculum with global perspectives and trends Prepare responsible citizens for future education and societal engagement	Ensure every learner has equitable access to quality, inclusive education that embraces diversity and local culture. Design and implement competency-based learning that emphasizes practical skills, values, and real-world application. Adopt learner-centered, adaptive pedagogies that respond to students' needs, interests, and abilities. Integrate active, experiential learning methods that foster critical thinking, collaboration, and creativity. Equip learners for a connected world by blending digital tools with global perspectives and community-rooted relevance.
India	Design curriculum around competencies across all subject areas. Emphasize conceptual understanding and foster critical, ethical, and creative thinking. Adopt discovery-based pedagogy that supports independent learning. Implement an integrated curriculum framework with interlinked components. Develop inclusive curriculum that respects diversity and multiple identities. Target cognitive, affective, and psychomotor competencies at a national standard. Cultivate 21st-century skills through thematic and multidisciplinary learning. Promote physical fitness and well-being as part of holistic education. Encourage cooperative, collaborative, and self-directed learning approaches. Utilize technology and information for human development and innovation. Use authentic assessments that reflect real-life tasks and applications. Strengthen livelihood skills and instill a habit of lifelong learning. Foster life skills, cultural values, and global understanding in an interconnected world. Nurture artistic appreciation and provide space for creative expression.	Blending traditional wisdom with modern educational approaches Aligning curriculum with NEP 2020 and the National Curriculum Framework Focusing on learner-centered, inclusive, and equitable education Emphasizing practical skills, critical thinking, and digital innovation Respecting cultural diversity while fostering global citizenship
Bhutan	Curriculum based on competency-based Purpose of curriculum is from knowledge acquisition to knowledge application, and the	Rooting education in values-based principles guided by Gross National Happiness

	process shifts from the teacher to the students. Curriculum encourages cognitive, and metacognitive learning and learners learn through understanding. Philosophy shift from silo-based approach to integrative STEM education Interdisciplinary learning and focuses more on problem solving and critical thinking than traditional “sit and get” learning. Learning focuses on content mastery rather than mere content completion. Curriculum focuses creative/critical thinking, decision-making, and problem-solving. Higher chance of spontaneously transmitting the life skills education to the students. The four pillars of learning are “learning to know”, “learning to do”, “learning to be”, and “learning to live together” are the ethos of teaching and learning. To promote a system of continuous and life-long learning through formal, non- formal as well as informal modes to empower youths with competencies to participate meaningfully and constructively in life and in the society. Integrates academic content and skills with “soft skills” such as critical analysis, creativity, communication, problem solving, citizenship responsibilities and cultural sensitivity so that learners can apply or demonstrate those skills. Student-centered method of teaching and learning is to focus on mastering specific skills or standards rather than completing course work over a specific period.	Prioritizing competency-based learning for holistic student development Preserving cultural identity while promoting global awareness Centering pedagogy on student needs, interests, and emotional well-being Aligning curriculum design with the Bhutan Education Blueprint and national framework
Bangla desh	Ability to express one’s views and opinions properly and creatively according to the context, respecting and understanding the opinions and propositions of others. Ability to take logical and the most beneficial decisions for all after considering various aspects of an issue holistically through critical thinking. Ability to achieve the qualities of a global citizen by showing love and loyalty to one’s own country and upholding own traditions, culture, history and heritage while respecting differences and diversity. Ability to take logical and the most beneficial decisions for all and solve problems with the participation of all through problem projection, quick realisation, analysis, synthesis and consideration of future significance. Ability to adapt to the changing world through peaceful coexistence while maintaining cooperation, respect and harmony and to play a role in creating a safer habitable world for future generations.	Grounding education in progressive and re-constructivist philosophies Fostering ethical, adaptable, and competent citizenship Emphasizing student-centered, competency-based, and experiential learning Promoting critical thinking, inclusivity, social justice, and core values Integrating national identity with global competencies Equipping learners to navigate 21st-century challenges confidently

	Ability to artistically present and contribute to national and global welfare by creating new ways, strategies and possibilities adapting new attitudes, ideas, and perspectives. Ability to create and maintain risk-free, safe and acceptable personal, familial, social, state and global relationships and communications by knowing one's own position and role in managing one's own physical and mental health. Ability to deal with disasters by sfacing risks and opportunities while keeping human dignity intact and preparing oneself for safe and secure life and livelihood in a constantly changing world. Ability to solve everyday problems in a changing world using mathematical, scientific, and technological skills. Ability to engage oneself in the welfare of nature and humanity through religious discipline, honesty and moral virtues, and the practice of integrity.	
Sri Lanka	Curriculum is based on competencies. Based on the needs of the country and its people Based on the lessons learnt over time. Based on the aim of producing an active contributor to sustainable National Development Based on the aim of producing an effective and efficient work-oriented citizen Based on the aim of producing an entrepreneur and a person with an entrepreneurial mindset Based on the aim of producing a patriotic citizen Based on the aim of producing a good human being Based on the aim of producing a member of a happy family	Developing well-rounded individuals for a knowledge-based society Grounding education in competency-based and student-centered approaches Ensuring equity, inclusivity, and lifelong learning for all learners Fostering cognitive, social, and emotional intelligence holistically Balancing national identity with global relevance and awareness Promoting critical thinking, creativity, and ethical citizenship
China	Promote moral cultivation and social harmony through character education and ethical behavior. Emphasize respect for teachers and authority as foundational to disciplined learning. Foster academic excellence and diligence as a path to personal and national development. Integrate traditional values with modern innovation to build a culturally rooted yet future-ready education system. Encourage collective responsibility and patriotism to strengthen national identity and unity. Support lifelong learning and self-improvement as essential to personal growth and societal contribution. Apply scientific thinking and inquiry to solve real-world problems and advance technological progress.	Basing education on constructivist and humanistic learning philosophies Emphasizing quality-oriented, student-centered education Developing competencies through critical thinking, creativity, and moral learning Promoting holistic growth over rote memorization Fostering national identity while allowing local curricular flexibility Integrating moral, intellectual, and innovative capacities in learners

	Ensure equity and access to quality education as a means of social mobility and national rejuvenation.	
Japan	Confucian Moral Education Humanistic Whole-Person Development Constructivist Learning Approach Perennial Values and Classical Knowledge Progressive Child-Centered Pedagogy Civic and National Identity Formation Democratic Participation and Dialogue Pragmatic Life-Skills Orientation Social Reconstruction and Global Responsibility Lifelong Learning Philosophy Global Citizenship and Intercultural Competence Zen-Inspired Mindfulness and Discipline	Basing education on humanistic and constructivist philosophies Promoting holistic student development through standardized yet adaptable frameworks Emphasizing moral education, active learning, and competency growth Fostering critical thinking, creativity, and social responsibility Balancing national curriculum coherence with local flexibility Ensuring equity and consistency across diverse educational settings
Vietnam	Competency-based and holistic curriculum reform Child-centered and developmentally appropriate approaches Integrated and interdisciplinary curriculum design Inclusive education for equity and access Technology-enhanced teaching and learning Localization and contextualization of curriculum Life skills, career readiness, and work-oriented education Participatory and collaborative curriculum development Flexible, diverse, and student-driven curriculum structures Value-based, quality-focused, and inquiry-oriented learning	Emphasizing Confucian-socialist values of morality, civic responsibility, and academic excellence Applying competency-based, learner-centered strategies for practical skill development Promoting critical thinking, creativity, and lifelong learning Integrating national identity and cultural heritage with global competencies Balancing traditional educational values with modern pedagogical innovations Committing to equity, inclusivity, and holistic learner development
Singapore	Recognize every child's potential to learn through supportive, learner-centered environments. Foster collaborative learning through dialogue, peer interaction, and shared meaning-making. Address both cognitive and emotional domains to develop knowledge, character, and resilience. Design developmentally appropriate and differentiated curriculum to meet diverse learner needs. Ensure coherence and progression in learning through concept revisiting and deepening. Embed 21st-century competencies like critical thinking, digital literacy, and global awareness. Position education as a driver of national and societal development and civic values. Cultivate student agency and ownership of learning through constructivist teaching practices.	Grounding curriculum in holistic, student-centered, and future-focused philosophies Fostering intellectual, moral, social, and emotional development through values-driven education Encouraging inquiry, collaboration, and self-directed learning within flexible and inclusive structures Balancing national identity with global competence and adaptability Integrating assessment for learning, Technology, and community engagement to promote lifelong learning

Malaysia	Develop balanced individuals intellectually, spiritually, emotionally, and physically through a holistic education. Foster national unity and identity by nurturing shared values, cultural understanding, and nationalism. Promote lifelong learning and self-development to prepare learners for personal and societal advancement. Ensure equitable access to quality education regardless of background, region, or ability. Strengthen moral and ethical values rooted in belief in God, good behavior, and civic responsibility. Align education with national development goals by cultivating skills for economic growth and innovation. Encourage learner-centered and competency-based approaches that support creativity and critical thinking.	Grounding education in integrated, humanistic, and competency-based principles Fostering holistic development across intellectual, emotional, spiritual, and physical domains Promoting unity and harmony within a multicultural and pluralistic society Blending traditional academic rigor with 21st-century skills and moral values Cultivating critical thinking, creativity, and ethical responsibility in learners
S. Korea	Confucian Ethico-Moral Foundations Humanistic Approach to Education Constructivist Learning Theory Pragmatic and Experiential Learning National Identity and Cultural Pride Progressive and Student-Centered Pedagogy Technological and Scientific Orientation Global Citizenship and Internationalization Lifelong Learning Philosophy Democratic and Inclusive Education Social Constructivism and Collaboration Ecological and Environmental Responsibility	Grounding curriculum in humanistic and constructivist learning philosophies Cultivating self-directed, creative, and socially responsible learners Developing key competencies such as self-management, civic responsibility, and communication Promoting student-centered approaches grounded in autonomy and collaboration Encouraging holistic development across intellectual, emotional, and social domains Balancing national curriculum standards with localized curricular flexibility Empowering schools and communities to innovate within an inclusive learning culture
UK	Promote holistic development, spiritual, moral, cultural, mental, and physical, of all pupils. Prepare learners for real-life roles by building responsibility, awareness, and opportunity readiness. Deliver a broad and balanced curriculum covering all planned learning and experiences. Implement statutory national curriculum through structured key stages and subject-specific programmes. Provide daily collective worship and ensure religious education across all key stages. Include sex and relationship education for all secondary-level students. Publish school curriculum details online by	Rooting education in holistic and humanistic philosophies Nurturing intellectual, emotional, and social development through inclusive learning environments Promoting lifelong learning, well-being, and student empowerment Fostering democracy, active citizenship, and social responsibility Adopting child-centered and curiosity-driven developmental approaches

	subject and academic year. Incorporate PSHE education guided by national best practices. Support autonomy in curriculum design by allowing schools to include additional subjects. Emphasize citizenship, sustainability, and employability through cross-curricular learning.	
Denmark	Ensure equitable access to free, high-quality education for all learners. Develop knowledge and skills for active societal participation and personal growth. Maintain state-regulated quality through continuous evaluation of educational institutions. Promote lifelong learning as a foundation for democratic engagement. Align education with labor market needs and societal relevance. Foster independent thinking and dialogue to build democratic values and civic responsibility. Engage students in project-based and interdisciplinary learning across all levels. Encourage personal responsibility through participation, collaboration, and critical reflection	Grounding education in egalitarian, humanistic, and learner-centered philosophies Promoting holistic development, democratic values, and lifelong learning Fostering critical thinking, creativity, and social responsibility through active engagement Emphasizing inclusivity and differentiated, interdisciplinary instruction Balancing national coherence with local flexibility and community adaptation
Germany	Ensure equal access to quality education through compulsory schooling and inclusive policies. Promote holistic learner development, intellectual, moral, cultural, and physical. Respect federal diversity by allowing each state (Länder) to shape its curriculum and policies. Emphasize vocational and academic pathways to support diverse learner aspirations. Foster democratic values and civic responsibility through participatory learning. Support lifelong learning and innovation to meet evolving societal and economic needs.	Shaping curriculum through federalism and broad national education standards Grounding education in humanistic and competency-based philosophies Emphasizing academic rigor, individual development, and vocational readiness Promoting interdisciplinary learning with subject-focused instruction Blending structured content with learner-centered teaching approaches Allowing pedagogical autonomy to adapt instruction to student needs
Finland	Holistic and Humanistic Education Equity and Inclusion Lifelong Learning and Well-being Democracy and Active Citizenship Sustainability and Global Responsibility Child-Centered and Developmental Approaches Child-Centered and Developmental Approaches Trust-Based and Professional Autonomy Engaging and meaningful learning Individualized support No Dead-ends	Rooting education in holistic and humanistic philosophies Nurturing intellectual, emotional, and social development through inclusive learning environments Promoting lifelong learning, well-being, and student empowerment Fostering democracy, active citizenship, and social responsibility Adopting child-centered and curiosity-driven developmental approaches

	Quality teaching Transversal competences Emphasis on Bildung/Didaktik	
Tanzania	Promote inclusive and equitable access to quality education for all learners. Foster holistic development intellectual, emotional, physical, moral, and spiritual. Advance learner-centered and competency-based pedagogy across all levels. Strengthen decentralization and community participation in education governance. Support lifelong learning and skills development for personal and national growth. Respect cultural diversity and multilingualism in curriculum and instruction. Ensure quality assurance and accountability through regular monitoring and evaluation. Empower learners with values of citizenship, responsibility, and sustainability. These principles reflect Tanzania's commitment to inclusive, transformative, and future.	Grounding education in transformative, competency-based, and inclusive principles Emphasizing learner-centered pedagogies that nurture critical thinking and creativity Promoting problem-solving and practical life skills alongside academic knowledge Fostering equity, inclusion, and social justice in teaching and learning Reflecting Tanzanian culture, values, and national identity in the curriculum Empowering students to become engaged, adaptable, and capable citizens
South Africa	Promote equity and redress to overcome historical imbalances in education. Foster democratic participation through inclusive governance and learner voice. Advance outcomes-based education that emphasizes measurable learning achievements. Support holistic learner development, intellectual, emotional, physical, and ethical. Encourage active and experiential learning rooted in real-world relevance. Respect cultural diversity and multilingualism in curriculum and pedagogy. Strengthen accountability and quality assurance through ongoing evaluation. Empower educators and communities as co-creators of meaningful learning environments.	Grounding education in transformative, outcome-based, and human rights principles Advancing equity, inclusivity, and social justice in a post-apartheid context Promoting active learning, critical thinking, and high academic standards Redressing historical imbalances through democratic and participatory education Integrating indigenous knowledge systems and environmental consciousness Embedding constitutional values and civic responsibility into the curriculum
Brazil	Interpret and apply knowledge of the physical, social, cultural, and digital world to understand reality and build an inclusive society. Investigate and solve problems using scientific reasoning, curiosity, and creativity across multiple domains. Appreciate and engage in artistic and cultural practices from diverse traditions, both local and global. Communicate using multiple languages and	Grounding education in constructivist, competency-based, and inclusive philosophies Developing ten core competencies for ethical, critical, and autonomous citizenship Promoting learner-centered pedagogy and participatory learning environments Fostering interdisciplinary learning through collaboration,

	forms, verbal, written, visual, digital, and mathematical, to express ideas effectively. Use digital technologies critically and ethically to access, produce, and share information in personal, academic, and social contexts. Understand and value diverse experiences to make responsible, autonomous choices aligned with one's life goals and civic duties. Form and defend reasoned arguments based on data and ethics to promote human rights, sustainability, and global awareness. Develop self-awareness and interpersonal skills to manage emotions, resolve conflicts, and cooperate with respect and resilience.	communication, and digital literacy Upholding equity, cultural diversity, and democratic engagement in schooling Aligning curriculum with Brazil's social justice and transformative education goals
USA	Align curriculum with New York State Learning Standards while maintaining local autonomy. Empower districts and schools to design and adopt instructional programs based on student needs. Implement a standards-based curriculum without prescribing specific content from the state level. Structure curriculum around the scope and sequence of concepts, skills, and learning experiences. Divide instruction into coherent units and lessons with defined timeframes and goals. Design curriculum to support skill acquisition as outlined in applicable learning standards. Address holistic development implicitly, though not explicitly stated in curriculum mandates. Ensure curriculum decisions remain localized to reflect community context and priorities.	Balancing local autonomy with federal educational guidelines Grounding education in progressive, humanistic, and standards-based ideals Promoting academic excellence alongside democratic citizenship Fostering core knowledge acquisition with essential life skills development Integrating digital literacy, collaboration, and civic engagement into learning Advancing equity, diversity, and inclusive practices across education systems
Canada	Curriculum rooted in progressivism. Equally prioritized constructivism and humanism Schools are agents of social change; education should promote equity, justice, reconciliation, and civic engagement Curriculum reflects Canada's diversity and promotes intercultural understanding. Focus on competency-based global education, aiming to provide transferable 21st-century skills.	Grounding education in humanistic, constructivist, and inclusive philosophies Emphasizing competency-based learning and holistic student development Promoting equity, multiculturalism, and democratic citizenship Integrating Indigenous perspectives and cultural diversity into curriculum content Encouraging learner-centered pedagogy and interdisciplinary approaches Allowing curricular flexibility and

		local adaptation across provinces and territories
Australia	Promote equity and excellence to ensure all students reach their full potential. Foster active and informed citizenship through democratic values and civic engagement. Support holistic development, intellectual, physical, social, emotional, and ethical. Encourage learner agency and voice to build confidence, autonomy, and school pride. Implement evidence-based teaching that supports deep learning and critical thinking. Integrate cross-curricular priorities like sustainability, Aboriginal and Torres Strait Islander histories, and Asia engagement. Strengthen partnerships with families and communities to enhance student learning and wellbeing.	Promoting equity, excellence, and holistic student development Emphasizing student-centered and competency-based learning approaches Fostering critical thinking, creativity, and ethical understanding Encouraging intercultural awareness and inclusive education practices Ensuring flexibility and responsiveness in curriculum implementation Integrating Aboriginal and Torres Strait Islander histories and cultures

Appendix D: General competencies for preprimary level across all countries

Country	ECED/Pre-Primary	Special Features
Nepal	Use of language for expression and communication Identification and daily use of nutritious food options Following healthy habits and good social behavior, and demonstrating models as needed Adopting personal safety measures Using thematic learning and creative thinking in the course of performing daily tasks Involvement in holistic development activities and use of basic skills in them	Using language purposefully for expression, interaction, and understanding Practicing healthy eating by identifying and choosing nutritious foods Demonstrating positive habits, hygiene, and pro-social behavior in daily life Applying creative thinking and thematic learning in routine tasks Participating actively in holistic activities using foundational life skills
India	To ensure child-friendly environment where each child is valued, and respected, feels safe, and secure and develops a positive self-concept. To enable a sound foundation for good health, well-being, nutrition, healthy habits and hygiene. To enable children to become effective communicators and foster both receptive and expressive language. To help children become involved learners, think critically, be creative, collaborate, communicate and connect with their immediate environment. To enable a smooth transition of children from preschool to primary schools. To work as partners with parents and community to enable each child to flourish.	Using language purposefully for expression, interaction, and understanding Practicing healthy eating by identifying and choosing nutritious foods Demonstrating positive habits, hygiene, and pro-social behavior in daily life Applying creative thinking and thematic learning in routine tasks Participating actively in holistic activities using foundational life skills
Bhutan	Lay the foundation for lifelong learning through primary education as the first formal stage. Provide essential knowledge and skills to nurture intellectual and personal growth. Foster a love for learning that Promotes curiosity and long-term educational engagement	Establishing primary education as the gateway to lifelong learning Delivering foundational knowledge and essential life skills for growth Nurturing intellectual development and personal confidence in young learners Fostering curiosity and intrinsic motivation through joyful learning experiences Supporting sustained educational engagement across future learning stages
Bangladesh	Begin secondary education at Grade VII as part of a six-year structured program. Organize secondary schooling into three distinct stages for progressive learning. Complete Lower Secondary Education in Grades VII and VIII. Advance through Middle Secondary Education in Grades IX and X. Undertake Higher Secondary Education in Grades XI and XII. Develop academic depth and specialization	Structuring secondary education into three progressive stages from Grade VII to XII Advancing academic depth and specialization across lower, middle, and higher levels Scaffolding curriculum to prepare learners for higher education and the workforce Fostering holistic growth through intellectual, social, and national value development Aligning learning pathways to support continuity and long-term educational progression

	progressively across the three stages. Prepare learners for higher education and employment through a scaffolded curriculum. Foster holistic development and national values throughout the second	
Sri Lanka	Describe an object/ process in their own words when engaged in a particular activity. Collect relevant information that could be applied within a theme. Demonstrate age-appropriate skills in activities within a theme.	Describing objects or processes clearly using their own words during hands-on tasks Collecting and connecting relevant information within thematic learning contexts Demonstrating age-appropriate skills through meaningful, theme-based activities
China	Develop basic social and emotional skills through play and interaction Foster curiosity and observation of the natural and social world Build early language and communication abilities in Mandarin Enhance motor coordination and physical development Introduce basic numeracy and logical thinking through games and activities Cultivate habits of cooperation, hygiene, and self-care	Building foundational social-emotional skills through play and interaction Fostering curiosity and active observation of the surrounding world Developing early communication and language abilities in Mandarin Enhancing motor coordination and physical growth through movement Introducing numeracy, logic, and self-care through guided activities
Japan	Fostering emotional stability and self-regulation Developing basic communication and language skills Encouraging curiosity and exploratory learning Promoting social interaction and cooperative behavior Cultivating basic habits for healthy living and self-care Nurturing creativity through play and artistic expression Building a sense of belonging, respect, and moral values	Fostering emotional stability, self-regulation, and positive behavior Building foundational language, communication, and social interaction skills Encouraging curiosity, exploration, and creative expression through play Cultivating habits for healthy living, hygiene, and personal well-being Instilling moral values, empathy, and a strong sense of belonging
Vietnam	Physical development and health for enhancing children's motor skills, physical fitness, and overall well-being. Cognitive and language development for thinking, problem-solving abilities, and effective communication. Emotional and social development to understand their feelings and build positive relationships with others. Aesthetic and creative development for imagination, artistic expression, and appreciation of beauty. Self-reliance and life skills to build independence, responsibility, and practical skills for everyday life.	Enhancing motor skills, physical fitness, and overall well-being through active play and health habits Developing cognitive, language, and problem-solving abilities through exploration and communication Fostering emotional awareness and social competence through interaction and empathy Nurturing creativity and imagination through artistic expression and aesthetic experiences Building independence, responsibility, and practical life skills for everyday challenges
Singapore	Know what is right and what is wrong Be able to share and play with others	Understanding right from wrong and making caring, responsible choices

	Be able to show care and respect for others Be curious and able to explore Be able to communicate their thoughts and feelings Be comfortable and happy with themselves Have developed physical co-ordination, healthy habits, and enjoy a variety of arts experiences Love their families, friends, teachers and people in their community	Sharing, playing, and cooperating respectfully with peers and adults Exploring their environment with curiosity, imagination, and confidence Expressing thoughts and emotions clearly through words and actions Developing physical coordination, healthy routines, and artistic enjoyment Building a strong sense of self, belonging, and love for their community
Malaysia	Develop early literacy and communication skills Strengthen basic numeracy and logical thinking Foster moral awareness and positive behavior Enhance motor coordination and physical health Encourage creativity through art and storytelling Build environmental awareness through exploration Promote independence and social interaction	Building foundational literacy, numeracy, and expressive communication Fostering moral values, independence, and pro-social behavior Enhancing physical coordination, health habits, and environmental awareness Nurturing creativity and imagination through storytelling and exploration
S. Korea	Self-Management and Emotional Regulation Effective Communication Skills Collaboration and Social Interaction Creative Thinking and Imagination Critical Thinking and Problem-Solving Cultural Awareness and Civic Responsibility Foundational Literacy and Numeracy Skills	Managing emotions and behavior to build self-regulation and resilience Communicating thoughts, feelings, and ideas clearly and effectively Collaborating respectfully through teamwork and positive social interaction Thinking critically and creatively to solve problems and express imagination Applying foundational literacy, numeracy, and civic values in everyday life
UK	Communication and Language: Develop listening, understanding, and expressive skills Physical Development: Build fine and gross motor skills, health, and self-care habits Personal, Social, and Emotional Development: Foster confidence, empathy, and emotional regulation Literacy: Begin phonics, early reading, and mark-making for writing Mathematics: Explore numbers, patterns, shapes, and spatial awareness Understanding the World: Investigate people, places, Technology, and the natural world Expressive Arts and Design: Encourage creativity through music, movement, and art	Managing emotions and behavior to build self-regulation and resilience Communicating thoughts, feelings, and ideas clearly and effectively Collaborating respectfully through teamwork and positive social interaction Thinking critically and creatively to solve problems and express imagination Applying foundational literacy, numeracy, and civic values in everyday life
Denmark	Foster emotional security and social interaction through play-based learning Develop early communication and language skills in Danish and home languages Encourage curiosity and exploration of the natural and social environment Build motor coordination and physical well-being through movement and outdoor activities Introduce basic numeracy and pattern recognition through games and storytelling	Fostering emotional security and social connection through play-based experiences Developing language and communication in Danish and home languages Exploring the natural and social world with curiosity and wonder Enhancing motor skills and physical well-being through active movement Introducing early numeracy and pattern recognition through playful learning

	Instill democratic values and empathy in daily routines and peer relationships	Instilling empathy and democratic values in everyday social interactions
Germany	Develop physical health and motor coordination through movement-based learning. Explore nature and Foster holistic development across intellectual, physical, emotional, and social domains. Strengthen language, communication, and early literacy through play and interaction. Promote personal and social growth with an emphasis on values, ethics, and identity formation. Introduce foundational concepts in math, Science, and Technology through discovery and inquiry. Encourage creative expression through arts, media, and imaginative activities. culture to build environmental awareness and contextual understanding. Support self-directed learning by enabling children to experiment, investigate, and learn from mistakes.	Fostering holistic development across cognitive, physical, emotional, and social domains Building language, communication, and early literacy through playful interaction Promoting ethical values, identity formation, and personal-social growth Exploring foundational math, Science, and Technology through inquiry-based learning Nurturing imagination and artistic expression through creative media and activities Encouraging curiosity, autonomy, and reflective thinking from early learning experiences
Finland	Promote holistic growth, health, and age-appropriate development for every child Support equitable and inclusive learning opportunities from an early age Create rich, play-based and culturally responsive learning experiences Ensure a safe, nurturing, and stimulating environment for learning and care Foster respectful and stable relationships between children and caregivers Celebrate diversity and promoting gender equality, empathy, and intercultural understanding Provide individual support and collaborative care for children with additional needs Empower children's agency, peer interaction, and ethical participation in society	Promoting holistic growth, health, and well-being in age-appropriate ways Creating inclusive, lifelong learning opportunities that ensure educational equity Providing rich, play-based and culturally rooted learning experiences Ensuring a nurturing, safe, and stimulating learning environment for every child Strengthening stable, respectful, and enduring adult-child relationships Fostering diversity awareness, gender equality, and intercultural respect Recognizing and responding to each child's individual support needs with care and collaboration
Tanzania	Language and Communication: Develop listening, speaking, and early literacy skills in Kiswahili. Mathematical Concepts: Recognize numbers, shapes, patterns, and basic counting. Environmental Awareness: Explore natural and social surroundings through observation and play. Life Skills: Practice hygiene, safety, cooperation, and emotional regulation. Creative Arts and Physical Development: Express through music, drawing, movement, and games. Moral and Civic Values: Begin to understand respect, responsibility, and community roles.	Developing early literacy and communication skills in Kiswahili through listening and speaking Exploring mathematical ideas by recognizing numbers, shapes, and patterns in daily life Observing and interacting with natural and social environments through play-based discovery Practicing hygiene, safety, cooperation, and emotional self-regulation in everyday routines Expressing creativity and enhancing motor skills through music, art, and movement Fostering moral awareness and civic responsibility within community and school settings

South Africa	Grade R (Early Childhood Care and Education) Well-being: Develop physical coordination, health habits, and emotional security Identity and Belonging: Build self-awareness, confidence, and social relationships Communication: Strengthen listening, speaking, and early literacy in home language Exploring Mathematics: Recognize patterns, numbers, shapes, and spatial concepts Creativity: Express through music, movement, drawing, and imaginative Knowledge and Understanding of the World: Explore nature, community, and environment through observation and inquiry.	Building physical coordination, healthy routines, and emotional security through daily activities Developing identity, confidence, and a sense of belonging through social interaction Strengthening communication and early literacy in the home language through listening and speaking Exploring patterns, numbers, and spatial understanding through playful mathematical experiences Expressing creativity and curiosity through music, art, movement, and nature-based exploration
Brazil	Preschool (Educação Infantil) Develop identity, autonomy, and emotional well-being through play and interaction Strengthen oral language and early communication in meaningful contexts Explore the natural and social world through observation and curiosity Foster creativity and expression through music, movement, and visual arts Build motor coordination and body awareness through physical activities Encourage coexistence and respect for diversity in group settings Promote ethical values and empathy in daily routines and relationships	Building identity, autonomy, and emotional well-being through playful social interaction Strengthening oral language and early communication in real-life learning contexts Exploring nature and society with curiosity, observation, and inquiry Fostering creativity and self-expression through arts, music, and movement Promoting empathy, diversity, and ethical values in daily routines and relationships
USA	A standards-based curriculum has been adopted No explicitly focus on holistic development of child. However, the curriculum implicitly seems so. All curriculum and instructional decisions are made at the local level Curriculum is the scope and sequence of learning experiences taught in a course or grade level to provide students with opportunities to achieve knowledge and skills as defined by applicable learning standards.	Adopting a standards-based framework to guide curriculum and instruction Sequencing learning experiences to align with grade-level knowledge and skills Empowering local stakeholders to shape curriculum decisions and implementation Providing structured opportunities for students to achieve defined learning outcomes Promoting implicit support for holistic development through content and pedagogy
Canada	Foster self-awareness, emotional regulation, and resilience Develop verbal and non-verbal communication skills Build empathy, cooperation, and respectful relationships Enhance gross and fine motor coordination and physical health Strengthen problem-solving and foundational academic skills Promote curiosity, adaptability, and intrinsic motivation Encourage active exploration and reflective	Fostering emotional awareness, self-regulation, and personal resilience Developing expressive language and effective communication across contexts Building empathy, cooperation, and respectful social relationships Enhancing motor coordination, physical health, and active engagement Strengthening curiosity, problem-solving, and self-motivated learning

	thinking Support holistic development across social, emotional, and cognitive domains	
Australia	Develop early literacy and numeracy foundations Foster curiosity and engagement through play-based learning Build social-emotional skills and self-regulation Enhance physical coordination and healthy habits Explore creativity through music, movement, and art Strengthen oral language and listening comprehension Begin understanding of self, others, and the environment Basic: Strengthen reading, writing, and mathematical fluency Apply scientific inquiry and observation skills Develop historical and geographical understanding Use digital tools safely and effectively Express creatively through visual and performing arts Practice teamwork, empathy, and respectful communication Understand civic values and environmental responsibility Maintain physical fitness and personal wellbeing	Building early literacy, numeracy, and language skills through meaningful engagement Fostering curiosity, exploration, and problem-solving through play and guided inquiry Developing self-awareness, emotional regulation, and social relationships Enhancing physical coordination, healthy routines, and well-being Expressing creativity through movement, music, art, and imaginative play Using digital tools responsibly to support learning, communication, and expression Exploring community, culture, and the environment with empathy and civic understanding

Appendix E: General competencies for basic level across all countries

Country	Basic	Special features
Nepal	Ingraining with patriotism and national integration and demonstration of democratic value, attitude, and tendency in behavior Development of language and communication skills and their creative, practical and appropriate use Exchange of information and communication, analysis and proper use of information and Technology Development of logical and applied math knowledge, skill, and attitude and their use Curiosity and understanding towards scientific approach, facts, theory, and principles and use in practical life Development of human value and faith and social quality and aware of civic duty Understanding the relationship between population, environmental conservation and sustainable development and contribution to their management Development of physical fitness, healthy life style and life skills Respect of local and modern profession, occupation, and Technology and labor as well and application of useful soft skills Protection and promotion of Nepali art, literature, and culture and their practice Having familiarity with national and international contexts and fostering understanding and acceptance of diversity, global fraternity, and co-existence Identification of the problems being faced in everyday life and their analysis and settlement	Fostering patriotism, democratic values, and national cohesion through civic behavior Enhancing language proficiency for creative, practical, and effective communication Using information and Technology responsibly for analysis and collaboration Applying mathematical logic and skills to practical and problem-solving contexts Exploring scientific concepts with curiosity and applying them in everyday life
India	Provide ample scope for holistic i.e., physical, intellectual and social development of students; Emphasize constructivism rather than rote learning by highlighting the importance of hands-on experience; enlist general and specific teaching and assessment objectives to make learning competency-based and attain mastery over laid down competencies; encourage the application of knowledge and skills in real-life problem-solving scenarios; uphold the ‘Constitutional Values’ by encouraging values-based learning activities;	Promoting holistic development across physical, intellectual, and social domains Fostering hands-on learning through constructivist approaches Designing competency-based objectives for teaching and assessment Applying knowledge and skills to real-world problem-solving Integrating constitutional values through values-based learning experiences
Bhutan	Contribute to poverty reduction and equity through accessible and inclusive early education. Expand access to education by establishing schools close to communities. Emphasize education’s role in national development through early and equitable investment.	Reducing poverty through inclusive and equitable early learning opportunities Expanding educational access by localizing school infrastructure Investing early in education to accelerate national development Bridging social gaps by prioritizing marginalized learners from the start Embedding community participation in foundational education planning

Bangladesh	Begin secondary education at Grade VII as part of a six-year structured program. Organize secondary schooling into three distinct stages for progressive learning. Complete Lower Secondary Education in Grades VII and VIII. Advance through Middle Secondary Education in Grades IX and X. Undertake Higher Secondary Education in Grades XI and XII. Develop academic depth and specialization progressively across the three stages. Prepare learners for higher education and employment through a scaffolded curriculum. Foster holistic development and national values throughout the second	Beginning structured secondary education from Grade VII through Grade XII Segmenting learning into lower, middle, and higher secondary phases Progressively deepening academic understanding and subject specialization Scaffolding curriculum to support transition to higher education or employment Fostering holistic development and instilling national and civic values Sequencing learning experiences to build continuity and progressive mastery
Sri Lanka	Competencies in communication - literacy, numeracy, graphics, information Technology proficiency Competencies relating to the social, biological and physical environment Competencies relating to ethics and religion Competencies relating to use of leisure, enjoyment and recreation Competencies in learning to learn Competencies relating to personality development Competencies relating to preparation for the world of work	Communicating fluently through literacy, numeracy, visual, and digital skills Understanding and interacting with natural, social, and physical environments Upholding ethical values and appreciating spiritual and religious diversity Engaging meaningfully in leisure, recreation, and creative expression Becoming self-directed learners with metacognitive and reflective strategies Developing personal identity, career readiness, and life skills for the world of work
China	Strengthen foundational literacy and numeracy in Chinese and Mathematics Develop scientific thinking through observation and simple experiments Build moral awareness and civic responsibility via Ideology and Politics Enhance artistic expression and aesthetic appreciation in music and art Promote physical fitness and teamwork through structured PE Introduce digital literacy and safe Technology use	Building strong foundations in literacy, numeracy, and scientific inquiry Fostering civic responsibility and moral reasoning through values education Expressing creativity and cultivating aesthetic appreciation in the arts Developing physical health and teamwork through structured physical education Introducing digital literacy and promoting safe, ethical Technology use
Japan	Fostering emotional stability and self-regulation Developing basic communication and language skills Encouraging curiosity and exploratory learning Promoting social interaction and cooperative behavior Cultivating basic habits for healthy living and self-care Nurturing creativity through play and artistic expression Building a sense of belonging, respect, and moral	Developing emotional stability and self-regulation in daily routines Building foundational language and communication abilities Fostering curiosity through exploration and inquiry-based activities Promoting positive social interaction and cooperative learning Encouraging healthy habits, self-care,

	values	and physical well-being Nurturing creativity and moral development through play and expression
Vietnam	Developing the ability to learn independently and take responsibility for one's own learning. Enhancing the capacity to solve problems and think creatively in various contexts. Building the ability to communicate effectively in both spoken and written forms. Cultivating the capacity to cooperate and work effectively in groups. Strengthening the ability to use language for thinking, expression, and communication. Promoting logical reasoning and mathematical thinking for daily application. Acquiring skills to use digital tools and Technology responsibly and effectively. Forming a sense of morality and civic responsibility through values education. Encouraging aesthetic appreciation and physical development through arts and physical activities.	Taking ownership of learning through independent and self-directed study Solving problems creatively and thinking critically across varied contexts Communicating ideas effectively using language in spoken and written forms Collaborating respectfully and working cooperatively in diverse groups Applying logic, math, and digital literacy to real-life tasks and inquiry Developing values, aesthetic sense, and physical well-being through holistic education
Singapore	Be able to distinguish right from wrong. Know their strengths and areas for growth. Be able to cooperate, share and care for others. Have a lively curiosity about their surroundings. Be able to think for and express themselves confidently. Take pride in their work. Have healthy habits and an awareness of the arts. Know and love Singapore. Have moral integrity. Believe in their abilities and be able to adapt to change. Be able to work in teams and show empathy for others. Be creative and have an inquiring mind. Be able to appreciate diverse views and communicate effectively. Take responsibility for their own learning. Enjoy physical activities and appreciate the arts. Believe in Singapore and understand what matters to our country.	Upholding moral integrity and distinguishing right from wrong with confidence Knowing oneself and taking ownership of learning and personal growth Caring for others through empathy, cooperation, and teamwork Thinking creatively and expressing ideas with curiosity and pride Respecting diverse perspectives and communicating openly and effectively Leading a healthy lifestyle while valuing the arts and cultural awareness Demonstrating national pride, adaptability, and civic-minded responsibility
Malaysia	Build language proficiency in multiple languages Apply mathematical reasoning in daily life Explore scientific ideas through observation and inquiry Instill civic values and national identity Use digital tools responsibly and effectively Express creatively through arts and music Maintain physical health and hygiene Understand basic economics and entrepreneurship	Strengthening communication through multilingual language proficiency Applying logic and numeracy to real-life situations and decisions Exploring scientific ideas through observation, inquiry, and experimentation Demonstrating civic values, national identity, and ethical responsibility Expressing creativity, digital fluency, and healthy living for personal development

S. Korea	Communicating effectively using appropriate language in various social and academic contexts. Thinking critically and creatively to solve problems and generate new ideas. Collaborating with others through respectful interaction and teamwork. Understanding and managing emotions to build positive relationships and self-regulation. Applying basic knowledge and skills across subject areas to real-life situations. Using information and digital tools responsibly for learning and communication. Demonstrating civic responsibility and respect for democratic values and cultural diversity. Exercising self-directed learning by setting goals and evaluating progress. Making ethical decisions and acting responsibly in daily life and social settings. Appreciating beauty and culture through participation in arts and cultural activities.	Communicating clearly across academic and social settings using appropriate language Solving problems and generating ideas through critical and creative thinking Collaborating respectfully and working effectively with diverse peers Managing emotions to foster self-awareness and positive relationships Transferring knowledge and skills to real-world challenges across disciplines Using digital tools responsibly for learning, research, and communication Practicing ethical decision-making and civic-minded behavior in daily life
UK	English: Develop reading fluency, comprehension, grammar, and writing composition Mathematics: Strengthen number operations, geometry, measurement, and problem-solving Science: Build inquiry skills and understanding of biology, physics, and chemistry History and Geography: Explore local and global contexts, chronology, and spatial awareness Art and Design / Music: Foster creativity, appreciation, and performance Physical Education: Promote fitness, coordination, and teamwork Computing: Introduce coding, digital literacy, and online safety Religious Education (RE): Understand diverse beliefs and moral values Personal, Social, Health and Economic Education (PSHE): Develop life skills, wellbeing, and citizenship	Developing core literacy and communication through reading, writing, and language use Strengthening mathematical reasoning through numbers, shapes, and real-world problem-solving Exploring scientific concepts and inquiry across biological, physical, and chemical domains Understanding history, geography, and diverse worldviews through contextual exploration Expressing creativity and cultural appreciation through the arts and physical movement Building life skills, digital fluency, and ethical understanding for personal and civic growth
Denmark	Strengthen literacy and numeracy foundations across subjects and contexts Promote critical thinking and problem-solving through inquiry and project work Develop civic responsibility and democratic participation in school and society Encourage interdisciplinary learning and creativity through thematic units Support digital literacy and responsible Technology use from early grades Foster personal development and well-being through life skills and health education Respect cultural diversity and global perspectives in curriculum and classroom dialogue Prepare for lifelong learning and active citizenship through reflective practices	Strengthening foundational literacy and numeracy across learning contexts Promoting inquiry-based thinking and collaborative problem-solving Cultivating civic responsibility and democratic engagement in education Integrating interdisciplinary knowledge through creative thematic approaches Developing digital fluency and ethical Technology use from early years Fostering well-being through life skills, health, and personal development Valuing cultural diversity and global awareness in classroom dialogue

		Encouraging lifelong learning through reflection and active citizenship
Germany	Promote patriotism, national unity, and democratic behavior in everyday life. Develop language and communication skills for creative and practical use. Exchange, analyze, and apply information and Technology effectively. Apply logical reasoning and mathematical knowledge in real-life situations. Foster scientific curiosity and understanding for practical application. Instill human values, social responsibility, and civic awareness. Understand and manage links between population, environment, and sustainability. Maintain physical well-being and practice healthy, skillful living. Respect and apply skills from traditional and modern occupations and Technology. Recognize national and global diversity to foster coexistence and fraternity. Identify, analyze, and resolve everyday life challenges with practical solutions.	Fostering patriotism, unity, and democratic values in daily life and learning Communicating effectively through creative and functional language use Utilizing information and Technology for inquiry, analysis, and application Applying logical reasoning and mathematical thinking in practical contexts Exploring scientific ideas with curiosity and real-world relevance Demonstrating civic responsibility, ethical behavior, and human values Linking population dynamics with environmental sustainability and action Promoting well-being, life skills, and respect for diverse livelihoods
Finland	Learning to learn, well-being, empathy. Thinking and learning to learn Cultural competence, interaction and self-expression Taking care of oneself and managing daily life Multiliteracy ICT Competence Working life competence and entrepreneurship Participation, involvement and building a sustainable future Developing schools as learning communities Emphasizing the joy of learning emphasizing collaborative atmosphere Promoting student autonomy in studying and in school life.	Cultivating curiosity, metacognition, and joy in self-directed learning Fostering emotional well-being, empathy, and healthy self-management Engaging in respectful interaction, cultural competence, and creative expression Strengthening multi-literacy and ICT fluency across learning domains Developing practical life skills, entrepreneurship, and workplace readiness Promoting active participation and commitment to a sustainable future Nurturing inclusive learning communities through collaboration and student voice
Tanzania	Literacy and Numeracy: Strengthen reading, writing, and arithmetic in Kiswahili and English. Science and Technology: Build inquiry skills and understanding of the natural world. Civic and Moral Education: Foster patriotism, ethics, and social responsibility. Vocational Skills: Introduce agriculture, crafts, and entrepreneurship basics. Life Skills and Health Education: Promote decision-making, hygiene, and personal safety. ICT Integration: Begin using digital tools for learning and communication. Cultural and Creative Expression: Encourage music, art, and traditional knowledge.	Enhancing literacy and numeracy through bilingual reading, writing, and arithmetic Exploring Science and Technology through observation, inquiry, and experimentation Cultivating civic values, moral integrity, and social responsibility Introducing vocational knowledge in agriculture, crafts, and entrepreneurship Developing life skills, hygiene habits, and personal safety awareness Using digital tools for basic learning, research, and communication

		Expressing creativity and preserving cultural heritage through the arts
South Africa	Language Competency: Read, write, and communicate effectively in home and additional languages Mathematical Literacy: Apply number sense, operations, measurement, and problem-solving Scientific Inquiry: Observe, investigate, and explain natural and physical phenomena Social Responsibility: Understand history, geography, and civic values Life Skills: Develop personal health, safety, emotional intelligence, and social skills Creative Arts: Engage in visual arts, music, drama, and movement Technology and Economic Awareness: Explore basic design, production, and financial literacy	Communicating effectively in home and additional languages across contexts Applying mathematical reasoning and number sense to everyday challenges Exploring scientific ideas through observation, investigation, and explanation Demonstrating civic awareness, historical understanding, and social responsibility Building life skills through health education, emotional literacy, and relationships Expressing creativity and engaging with Technology, arts, and economic understanding
Brazil	Primary Education (Ensino Fundamental – Anos Iniciais e Finais) Consolidate literacy and numeracy skills across subjects and contexts Develop scientific reasoning and inquiry through experimentation and observation Foster historical and geographical awareness to understand society and environment Strengthen digital literacy and responsible Technology use Promote civic responsibility and democratic participation Encourage artistic and cultural expression through diverse media Support emotional intelligence and social interaction in school life	Strengthening foundational literacy and numeracy across subject areas Exploring scientific ideas through observation, experimentation, and reasoning Building socio-environmental awareness through history and geography Enhancing digital fluency and encouraging ethical use of Technology Fostering democratic values, civic responsibility, and student participation Nurturing emotional intelligence, creativity, and cultural expression in school life
USA	All curriculum and instructional decisions are made at the local level Curriculum is the scope and sequence of learning experiences taught in a course or grade level to provide students with opportunities to achieve knowledge and skills as defined by applicable learning standards.	Empowering local authorities to design and implement curricula Structuring learning through sequenced content and experiences Aligning instruction with grade-level learning standards and goals Ensuring coherent progression of knowledge and skill development Providing equitable opportunities for students to meet defined competencies
Canada	Foster self-awareness, emotional regulation, and resilience Develop verbal and non-verbal communication skills Build empathy, cooperation, and respectful relationships Enhance gross and fine motor coordination and physical health Strengthen problem-solving and foundational academic skills Promote curiosity, adaptability, and intrinsic	Cultivating emotional awareness, self-regulation, and personal resilience Developing expressive communication through verbal and non-verbal skills Fostering empathy, cooperation, and respectful social relationships Enhancing physical coordination, motor skills, and healthy habits Strengthening foundational academics through inquiry and problem-solving

	motivation Encourage active exploration and reflective thinking Support holistic development across social, emotional, and cognitive domains	Encouraging curiosity, adaptability, and reflective, self-motivated learning
Australia	Strengthen reading, writing, and mathematical fluency Apply scientific inquiry and observation skills Develop historical and geographical understanding Use digital tools safely and effectively Express creatively through visual and performing arts Practice teamwork, empathy, and respectful communication Understand civic values and environmental responsibility Maintain physical fitness and personal wellbeing	Strengthening foundational literacy, numeracy, and scientific inquiry Building socio-historical and geographical awareness through exploration Using digital technologies responsibly for learning and expression Fostering creative thinking through the visual and performing arts Practicing empathy, teamwork, and effective interpersonal communication Promoting civic values, environmental stewardship, and personal well-being

Appendix F: General competencies for secondary level across all countries

Country	Secondary	Special Features
Nepal	To be a conscious citizen responsible for the promotion of the nation and nationality by adopting human values, norms and democratic culture To play a role in building a civilized, cultured and egalitarian society by becoming familiar with the national and international environment and embracing diversity, harmony and coexistence To use language skills in an appropriate, creative and respectful manner with confidence in daily activities as well as in the academic field To learn effectively, think creatively and analytically and exchange ideas through social contact and communication To develop a positive attitude towards learning and develop the habit of self-study and seeking knowledge and skills for personal development and fulfillment of needs To understand and apply practical mathematical knowledge and skills and to use mathematical concepts, principles and logical skills in problem solving To use practical scientific knowledge, facts, theories and Technology appropriately Acquire the necessary procedural skills for scientific discovery and research and use modern technologies in daily life Demonstrate socially relevant behavior by using life skills by recognizing identity with the life world and behavior Active participation in environmental protection and promotion and population management along with health awareness Analyze natural and social phenomena, understand their causes and effects, and demonstrate positive behavior Prepare confidently for the world of work with respect for labor Develop and use technical knowledge, skills, attitudes, and professional and managerial abilities at the higher level Develop a foundation for higher level studies	Upholding national values through civic responsibility and democratic engagement Cultivating intercultural sensitivity and contributing to equity and social justice Using language confidently across social and academic spheres with respect and clarity Applying analytical skills, curiosity, and motivation for personal and intellectual development Applying logical reasoning, scientific inquiry, and digital literacy to practical tasks Promoting environmental stewardship, wellness, and readiness for skilled work and higher study
India	Promote soft skills, life skills, financial literacy, digital literacy, health and wellness, road safety, citizenship education, disaster management and multilingualism; integrate innovations in pedagogy such as experiential, activity centered, joyful learning, Sport & Art-Integrated Learning, toy- based pedagogy, storytelling, gamification etc. with technological innovations (ICT integration) to keep pace with the global trends in various disciplines; promote inclusive practices as an overriding consideration in all educational activities; enhance and support learning by different types of assessments; strengthen knowledge and attitude related to livelihood skills; foster multilingual and multicultural learning and national understanding in an interdependent society; and	Building future readiness through promotion of 21st-century and life skills Integrating joyful, experiential, and Technology-enhanced pedagogical innovations Embedding inclusion and equity as cross-cutting principles in all learning processes Enhancing learning outcomes through diverse and formative assessment practices Strengthening livelihood education through vocational and employability skill development Fostering sustainable values through multilingual, multicultural,

	integrate environmental education in various disciplines	and environmental learning
Bhutan	Begin secondary education at Grade VII as part of a six-year structured program. Organize secondary schooling into three distinct stages for progressive learning. Complete Lower Secondary Education in Grades VII and VIII. Advance through Middle Secondary Education in Grades IX and X. Undertake Higher Secondary Education in Grades XI and XII. Develop academic depth and specialization progressively across the three stages. Prepare learners for higher education and employment through a scaffolded curriculum. Foster holistic development and national values throughout the secondary education.	Starting secondary learning at Grade VII with a unified six-year structure Segmenting education into lower, middle, and higher secondary phases Ensuring foundational growth through Grades VII and VIII Building academic rigor in Grades IX and X for transitional readiness Advancing specialization and depth in Grades XI and XII Scaffolding curriculum to support higher study and employment pathways Promoting comprehensive growth rooted in national values
Bangladesh	The ten core competencies that learners are expected to acquire through the competency-based curriculum from pre-primary to Grade 12 are: Begin secondary education at Grade VII as part of a six-year structured program. Organize secondary schooling into three distinct stages for progressive learning. Complete Lower Secondary Education in Grades VII and VIII. Advance through Middle Secondary Education in Grades IX and X. Undertake Higher Secondary Education in Grades XI and XII. Develop academic depth and specialization progressively across the three stages. Prepare learners for higher education and employment through a scaffolded curriculum. Foster holistic development and national values throughout the second	
Sri Lanka	Explain how basic knowledge can be applied to straightforward phenomena/problems under guidance. Interpret relevant information within the subject area. Select and use appropriate skills and methods under the guidance within the subject area Explain simple phenomena/problems using fundamental theories within the subject area. Interpret non-routine information within the subject area. Select and use appropriate skills, methods, and procedures within the subject area.	Applying basic knowledge to solve guided, routine problems Interpreting familiar information within specific subject contexts Using subject-relevant skills and methods under teacher direction Explaining simple phenomena using foundational theories Engaging with non-routine information using subject understanding Selecting and applying appropriate procedures independently within domains
China	Pursue academic or vocational specialization aligned with career goals Engage in research, innovation, and inquiry-based learning	Specializing academically or vocationally based on future career aspirations

	Demonstrate ethical reasoning and civic engagement in Ideology and Politics Refine analytical and expressive skills in language and literature Apply scientific and technological knowledge to societal challenges Prepare for Gaokao (national college entrance exam) or vocational pathways	Engaging in critical inquiry, research practices, and innovative thinking Exercising civic consciousness and ethical judgment in sociopolitical contexts Strengthening argumentation, analysis, and expression in language disciplines Translating scientific and technological understanding into real-world applications Strategically preparing for higher education or skilled vocational entry routes
Japan	Develop critical thinking skills for making independent and informed decisions. Enhance communication abilities in both Japanese and foreign languages. Foster collaboration and teamwork through group activities and shared goals. Strengthen logical reasoning in analyzing information and drawing conclusions. Promote scientific inquiry to understand natural phenomena through observation and experimentation. Cultivate cultural awareness and appreciation of Japanese and global traditions. Encourage creative expression in the arts, literature, and problem-solving. Utilize information and communication Technology (ICT) for research and daily tasks. Build a sense of social responsibility and contributing to community and national development. Nurture emotional intelligence to understand and manage oneself and relationships. Understand economic and environmental sustainability for informed citizenship. Apply mathematical skills to real-life situations and abstract reasoning. Engage in lifelong learning to adapt to societal and global changes.	Thinking critically to make reasoned, independent decisions Communicating effectively in Japanese and foreign languages Collaborating in teams to achieve shared goals Reasoning logically to analyze and draw conclusions Exploring nature through scientific observation and inquiry Appreciating cultural traditions from Japan and the world Expressing creativity through arts, literature, and problem-solving Using ICT tools for learning, research, and daily tasks Contributing responsibly to community and national development Managing emotions and relationships with empathy Understanding sustainability for responsible citizenship Applying math skills to everyday and abstract problems Learning continuously to adapt to a changing world
Vietnam	Strengthen self-regulated learning and critical evaluation skills. Solve complex problems and generating innovative ideas. Present information clearly and persuasively in diverse situations. Collaborate effectively and taking leadership roles when needed. Master language for academic, professional, and social purposes. Apply math and Science concepts to interpret and solve real-world issues. Use digital tools proficiently for academic research,	Regulating one's own learning and evaluating information critically Solving complex problems and generating original solutions Presenting ideas clearly and persuasively across contexts Collaborating in teams and exercising leadership when appropriate Using language effectively for academic, social, and career needs Applying math and Science to interpret and address real-life

	collaboration, and creation. Promote mental, emotional, and physical well-being. Engage in creative activities and appreciating cultural values. Make ethical decisions and contributing to community and national development. Respond effectively to international contexts and diverse environments.	issues Utilizing digital tools for research, creation, and collaboration Promoting holistic well-being—mental, emotional, and physical Creating artistically and valuing diverse cultural expressions Acting ethically and contributing to social and national progress Adapting to global settings and appreciating cultural diversity
Singapore	Have moral courage to stand up for what is right. Be resilient in the face of adversity. Be able to collaborate across cultures and be socially responsible. Be innovative and enterprising. Be able to think critically and communicate persuasively. Be purposeful in pursuit of excellence. Pursue a healthy lifestyle and have an appreciation for aesthetics. Be proud to be Singaporean and understand Singapore in relation to the world.	Upholding integrity and courage in making ethical choices Demonstrating resilience and purpose in overcoming challenges Collaborating across cultures with social responsibility Thinking critically, communicating persuasively, and innovating boldly Leading a healthy, balanced life with aesthetic appreciation Embracing national identity while engaging with a global perspective
Malaysia	Deepen subject knowledge across disciplines Apply critical and creative thinking to problems Use digital technologies for learning and innovation Participate in civic and global discussions Plan careers through vocational and life skills Strengthen ethical reasoning and emotional maturity Appreciate culture through creative expression Sustain healthy lifestyles and personal growth	Expanding disciplinary knowledge through interdisciplinary learning Solving problems with critical thinking and creative insight Leveraging digital tools for innovation and lifelong learning Demonstrating global citizenship and ethical responsibility Cultivating personal wellness, cultural appreciation, and career readiness
S. Korea	Demonstrate effective communication skills in both oral and written forms. Apply critical thinking and problem-solving strategies to real-world situations. Utilize information and communication Technology (ICT) effectively and ethically. Exhibit creativity and innovation in academic and extracurricular activities. Collaborate respectfully and productively in diverse group settings. Understand and appreciate cultural diversity and global citizenship. Practice self-directed learning and take responsibility for one's own education. Develop moral and ethical reasoning based on societal values and norms. Maintain physical and mental health through healthy lifestyle choices. Demonstrate the ability to analyze and interpret scientific and mathematical data.	Communicating effectively and expressing ideas with clarity and purpose Solving real-world problems through critical, creative, and ethical thinking Using digital tools responsibly for learning, innovation, and collaboration Engaging constructively in teamwork, leadership, and community service Embracing diversity global citizenship, and moral responsibility Fostering lifelong learning, personal well-being, and analytical literacy

	Engage actively in community service and social responsibility initiatives. Cultivate leadership skills and the ability to influence positive change.	
UK	Analyze texts, develop argumentation, and refine writing Mathematics: Advance algebra, statistics, geometry, and reasoning Sciences (Biology, Chemistry, Physics): Deepen scientific knowledge and experimental skills Humanities (History, Geography, RE): Promote critical thinking, ethical reasoning, and global awareness Modern Foreign Languages: Build communication and intercultural competence Design and Technology / Computing: Apply innovation, coding, and design thinking Physical Education: Maintain physical health and resilience PSHE and Citizenship: Strengthen emotional intelligence, financial literacy, and civic engagement Creative Arts (Music, Drama, Art): Encourage expression, collaboration, and cultural appreciation	Interpreting texts and constructing arguments through refined literacy skills Applying mathematical reasoning to solve abstract and real-world problems Investigating scientific concepts using inquiry and experimentation Analyzing human experiences through ethical, historical, and global lenses Communicating across languages with cultural sensitivity and fluency Innovating with Technology through coding, design, and digital creativity
Denmark	Respect cultural diversity and global perspectives in curriculum and classroom dialogue Prepare for lifelong learning and active citizenship through reflective practices Upper Secondary Education (General and Vocational Tracks) Deepen academic or vocational specialization aligned with student interests and career goals Apply knowledge to real-world challenges through research, innovation, and collaboration Strengthen analytical, ethical, and communicative competencies across disciplines Promote autonomy and self-directed learning in preparation for higher education or employment Integrate sustainability and global awareness into subject content and school culture Encourage civic engagement and democratic values through debate and social action Support personal growth and resilience through guidance and life orientation programs	Respecting cultural diversity and embracing global perspectives in education Specializing academically or vocationally to align with career aspirations Applying interdisciplinary knowledge through inquiry, collaboration, and innovation Strengthening reasoning, ethics, and communication across subject areas Fostering self-directed learning for lifelong growth and higher education readiness Promoting sustainability, global awareness, and civic responsibility in school culture Supporting personal development, resilience, and wellbeing through life guidance
Germany	Deepen academic or vocational specialization aligned with student pathways Apply analytical and research skills across disciplines and real-world issues Demonstrate ethical reasoning and civic engagement in national and global contexts Integrate digital tools and scientific methods for innovation and problem-solving Communicate effectively in multiple languages for academic and intercultural competence Prepare for higher education or skilled employment through rigorous assessment and guidance	Specializing academically or vocationally based on individual learner pathways Solving complex problems through cross-disciplinary research and analysis Demonstrating civic-minded ethics in national and global engagement Leveraging Technology and scientific reasoning for innovation and impact Communicating fluently across languages for academic and

		cultural exchange
Finland	Critical Thinking & Learning to Learn competence Cultural and Interaction competence Multidisciplinary and creative competence Societal competence Ethical and environmental competence Global and cultural competence To strengthen transversal general knowledge across subjects (e.g., languages, Mathematics, Sciences, humanities) and foster critical thinking, problem-solving, and research skills. To enable students to design their individual learning paths through flexible study units (compulsory and elective courses) and achieve a minimum of 150 credits To support students in building their identity, worldview, and philosophy of life, emphasizing self-development, emotional skills, and mental health. To promote well-being competence, including resilience, stress management, and a positive school culture. To qualify students for higher education (universities/polytechnics) via the matriculation examination, which assesses mastery in core subjects (e.g., mother tongue, languages, Mathematics, humanities/Sciences).	Fostering critical inquiry and independent learning across disciplines Cultivating intercultural dialogue and collaborative communication skills Integrating creativity, design thinking, and cross-disciplinary knowledge Promoting civic responsibility and active participation in society Strengthening ethical awareness and environmental stewardship Supporting personal growth through identity-building and emotional wellness Ensuring readiness for higher education through flexible and rigorous learning paths
Tanzania	Subject Mastery: Deepen knowledge in core subjects like math, Science, languages, and humanities. Critical Thinking and Problem-Solving: Apply logic and analysis to academic and real-life issues. Digital and Information Literacy: Use ICT for research, collaboration, and innovation. Civic Competence: Understand governance, rights, and responsibilities in a democratic society. Career and Life Planning: Explore vocational pathways and entrepreneurship. Environmental and Global Awareness: Address sustainability, climate, and global interdependence. Personal and Social Development: Strengthen leadership, resilience, and ethical reasoning.	Building deep understanding across academic subject domains Thinking critically and solving problems in real-world contexts Using digital tools for informed research, communication, and creativity Demonstrating civic responsibility and understanding democratic principles Exploring career options through life planning and entrepreneurial thinking Fostering sustainability, resilience, and ethical personal development
South Africa	Subject Mastery: Deepen knowledge in core and elective subjects (e.g., Sciences, languages, economics, Technology) Critical and Analytical Thinking: Evaluate information, construct arguments, and solve complex problems Digital and Information Literacy: Use ICT tools for research, communication, and innovation Civic and Ethical Engagement: Understand rights, responsibilities, and democratic participation Career and Life Orientation: Explore vocational pathways, entrepreneurship, and personal development Cultural and Artistic Expression: Appreciate diverse heritages and express through creative disciplines Physical and Emotional Well-being: Maintain fitness, resilience, and mental health awareness	Strengthening subject expertise across core and elective disciplines Evaluating information critically to solve complex problems Using digital tools effectively for inquiry and innovation Demonstrating ethical understanding and civic responsibility Planning career and personal growth through informed choices Expressing creativity and fostering well-being through culture and self-care
Brazil	Secondary Education (Ensino Médio) Deepen interdisciplinary knowledge and critical thinking across academic areas Prepare for higher education and the world of work through	Strengthening subject expertise across core and elective disciplines Evaluating information critically to solve complex problems

	flexible learning paths Integrate scientific, technological, and humanistic perspectives Strengthen ethical reasoning and social responsibility Promote autonomy and lifelong learning habits Foster global awareness and intercultural understanding Encourage innovation, creativity, and problem-solving in complex contexts Use communication effectively across languages and media	Using digital tools effectively for inquiry and innovation Demonstrating ethical understanding and civic responsibility Planning career and personal growth through informed choices Expressing creativity and fostering well-being through culture and self-care
USA	Curriculum is the scope and sequence of learning experiences taught in a course or grade level to provide students with opportunities to achieve knowledge and skills as defined by applicable learning standards. Typically divided into units and lessons, the curriculum includes an outline of the scope of content, concepts, and skills to be taught, the sequence in which they are to be taught, the amount of time allocated for the content, and the materials and assessments to be used throughout instruction. In New York State, curriculum is developed and adopted locally and must be aligned with applicable State Learning Standards.	Organizing content and skills through structured scope and sequence Dividing instruction into units and lessons for progressive learning Outlining learning goals aligned with state or national standards Allocating time and selecting resources for effective instruction Designing assessments to support and measure student achievement
Canada	Analyze critically and solve problems effectively Generate ideas and act with creativity and initiative Manage learning independently with reflection and goal-setting Collaborate respectfully and value diverse perspectives Communicate clearly across formats and audiences Act ethically as global citizens for sustainable futures Use digital tools responsibly and competently Apply cross-disciplinary skills for real-life challenges	Thinking critically and solving complex problems with creativity and initiative Managing one's own learning through reflection, goal-setting, and adaptability Collaborating effectively while embracing diverse viewpoints and cultures Communicating clearly and ethically across formats, contexts, and audiences Applying digital fluency and interdisciplinary skills to real-world challenges
Australia	Deepen subject knowledge across academic disciplines Apply critical and creative thinking to complex problems Communicate effectively across formats and audiences Use digital technologies for research and innovation Engage with ethical, intercultural, and global issues Explore career pathways and entrepreneurial skills Demonstrate personal responsibility and resilience Contribute to sustainable and inclusive communities Creativity, workplace skills, diversity, global awareness.	Building deep subject mastery through interdisciplinary learning Solving complex problems with critical and creative thinking Communicating effectively across media, formats, and audiences Leveraging digital tools for inquiry, innovation, and collaboration Exercising ethical judgment and engaging with global diversity Developing career readiness, resilience, and social responsibility

Appendix G: Competencies in *Mathematics* subject across all countries

Country	Level	Competencies	Special Features
Nepal	Basic	Identification, measurement and construction of two-dimensional geometric shapes Use of numbers up to five digits in daily life using Devanagari and Hindu Arabic numerals Use of local numbering system Development of understanding of the concept of fractions and ability to compare Solving problems in daily life using basic mathematical operations Use of appropriate materials and units to explain objects and time and use in solving problems in daily life Development of ability to perform daily calculations by recognizing Nepali currency Acquisition of information from simple graphs and tables Development of mathematical knowledge, skills, thinking and attitude and application in daily life Measurement and construction of lines and angles and identification of different parts of solid objects Calculation and use of numbers up to crores in Devanagari and Hindu Arabic numerals Solving mathematical problems of daily life involving addition, subtraction, multiplication and division Solving simple practical problems related to fractional decimals and percentages	Identifying, measuring, and constructing 2D shapes using standard tools and techniques Applying multi-digit numbers, including Devanagari, Hindu-Arabic, and local numerals in daily contexts Developing conceptual understanding of fractions and comparing their values meaningfully Solving everyday problems using basic operations, time concepts, and measurement materials Building strong number sense, operations, and place value using multiple numeral systems Solving real-life problems through arithmetic, fractions, measurements, and percentages Exploring shapes, space, and measurement by constructing and analyzing geometric objects Applying mathematical reasoning, data interpretation, and algebraic thinking across subjects
	Secondary	Solving practical problems related to daily life related to measurement Exchange and construction of information based on tables and figures Solving simple problems related to algebraic expressions and equations Solving practical problems related to groups Solving practical problems related to the real number system Solving practical problems related to perimeter, area and volume Solving problems related to algebraic expressions and equations Constructing and examining properties and facts of plane and solid figures Solving problems using concepts related to coordinates Pythagorean theorem and transposition Classification, presentation and interpretation of data Developing the ability to establish relationships between mathematical knowledge, skills and concepts in the subject	

		area and learning areas of other subjects	
India	Basic	Build number fluency; Understand shapes; Handle basic problems Recall addition, subtraction, multiplication and division facts, Use mental math for two digit operations, Identify and extend patterns, Draw basic shapes, Measure lengths with standard units, Estimate and compare Tell time to the hour and half hour, Count currency, Read simple charts, Use +, −, ×, ÷ symbols appropriately	Developing Foundational Number Sense Enhancing Spatial and Geometric Understanding Strengthening Problem-Solving Skills Improving Functional Numeracy Fostering Cognitive and Analytical Thinking
	Secondary	Solve algebraic expressions Work with graphs Demonstrate procedural fluency with algebraic manipulation Reason abstractly with polynomials, Apply concepts of similarity and congruence Interpret and use graphical representations, Analyze data distributions and variance Employ trigonometric functions to model situations Solve problems using matrices Apply probability rules to events Use calculus concepts for rates of change (Grades 11–12) Construct mathematical arguments and proofs	Strengthen Algebraic and Analytical Fluency Deepen Geometric and Spatial Reasoning Bridge Math and Real-world Contexts Expand Data and Statistical Literacy Build Conceptual and Communicative Precision
Bhutan	Basic	Understand numbers Explore shapes Use math in day-to-day life Memorize single digit facts Use mental strategies in basic operations Recognize patterns in numbers Draw and describe shapes Measure objects using rulers Estimate simple quantities Read clocks Handle money transactions Interpret bar graphs Write equations with correct symbols	Build fluency in number comprehension Strengthen spatial awareness through shape exploration Apply Mathematics in practical daily situations Recall single-digit facts for efficient calculation Use mental strategies to perform basic operations Identify and extend numerical patterns Represent geometric understanding through drawing and description Measure physical objects with standard tools Develop estimation skills for everyday reasoning Read and interpret time accurately Conduct and understand money transactions Extract meaning from basic graphical data Express mathematical relationships symbolically

	Second ary	Manipulating algebraic expressions Interpreting data Planning mathematically Demonstrate procedural fluency with algebraic expressions and equations Reason abstractly about functions and relations Apply properties of triangles and circles in proofs Analyze data using measures of central tendency and dispersion Use trigonometric ratios to solve right-angled triangle problems Model real-world situations with linear and quadratic functions Solve systems of equations graphically and algebraically Interpret and construct scatter plots and correlation Apply mensuration to area and volume of solids, Communicate mathematical ideas with correct notation	Develop fluency in symbolic and algebraic manipulation Enhance precision in mathematical modeling and planning Strengthen geometric reasoning and deductive proof skills Deepen statistical literacy and data interpretation abilities Communicate concepts using structured and accurate notation
Banglades h	Basic	Counting confidently Recognizing shapes Solving everyday math problems Recall addition, subtraction, multiplication facts Use mental calculation for small numbers Identify arithmetic sequences Construct simple shapes Measure with non-standard and standard units Estimate lengths and weights Tell time, Count money Read tally charts Use mathematical notation correctly	Strengthening number sense and computational fluency Developing spatial awareness through shape exploration Applying Mathematics in daily financial and temporal contexts Building reasoning through pattern recognition and estimation Communicating quantitative ideas using standard symbols and visuals
	Second ary	Solving algebraic equations Discussing data; Using logic to solve issues Perform algebraic manipulations with polynomials and rational expressions Solve quadratic equations by factoring and formula Apply theorems of Euclidean geometry Analyze univariate data using histograms and measures of central tendency Use right triangle trigonometry in applied contexts Model growth and decay with exponential functions Interpret and plot functions and their inverses Calculate probabilities in compound events Solve problems involving surface area and volume Present mathematical arguments using	Building fluency in algebraic manipulation and equation solving Applying geometric theorems to analyze spatial relationships Interpreting, representing, and reasoning with data in real-world contexts Using mathematical models to understand patterns and change Communicating logical reasoning using standardized notation

		standard symbols	
Sri Lanka	Basic	Improving number skills Learning shapes Using math in real tasks Recall basic facts for addition subtraction, multiplication, division Apply mental strategies, Recognize number patterns Draw common shapes Measure length/area Use nonstandard units Tell time, Count currency Read pictographs/bar charts Use symbols accurately	Strengthening fluency in fundamental arithmetic operations Developing flexible thinking through mental strategies and pattern recognition Building foundational understanding of shapes and spatial concepts Applying measurement skills using both standard and informal units Fostering functional numeracy through time, money, and real-life tasks Communicating mathematical ideas using visuals and accurate symbols
	Second ary	Working with algebra Interpreting graphs Thinking critically Demonstrate fluency in algebraic techniques Reason with congruence and similarity in plane geometry Apply circle theorems to solve problems Use statistical inquiry to form hypotheses Solve trigonometric equations in right and obtuse triangles Model situations with linear quadratic and reciprocal functions Analyze matrices for transformations Interpret and sketch a range of graphs (parabolas, hyperbolas) Employ calculus basics for rate-of-change concepts Communicate solutions with precise mathematical language Communicate solutions with precise mathematical language	Developing fluency in algebraic operations and functional thinking Strengthening reasoning through geometric theorems and congruence Applying trigonometry and calculus to interpret change and motion Analyzing and visualize data patterns through graphs and statistics Using mathematical structures like matrices to model transformations Communicating arguments with clarity, logic, and formal notation
China	Basic	Gaining number accuracy Exploring planes and solids Solving routine tasks Memorize addition, subtraction, multiplication tables Use mental math for two digit operations Recognize numeric patterns, Sketch basic geometrical figures Measure with rulers, Estimate magnitudes Read clocks and calendars, Count money Interpret simple charts, Use =, $\neq$, $<$, $>$ correctly	Building fluency in arithmetic operations and numeric recall Strengthening mental strategies for flexible computation Developing foundational spatial reasoning through shape exploration Applying measurement and estimation in practical tasks Interpreting visual data and temporal information effectively Using mathematical symbols accurately to express relationships
	Second ary	Handling algebraic systems Drawing and reading graphs Logical reasoning Master algebraic and geometric proof	Strengthening proficiency in algebraic manipulation and logical proof Deepening understanding of

		techniques Use functions to model real-world phenomena Apply trigonometric identities to solve equations Analyze data with measures of central tendency Solve problems using matrices Understand and apply calculus concepts (senior high) Employ logical reasoning in axiomatic systems Use statistical inference methods	functional relationships through graphing Applying trigonometry and calculus to interpret real-world change Modeling and solve complex systems using matrix methods Develop fluency in statistical analysis and inference Enhancing mathematical reasoning within formal logical structures
Japan	Basic	Developing number fluency Recognizing shapes Applying basic problem solving Recall arithmetic facts Use mental strategies Identify patterns Draw standard shapes with ruler/compass Measure lengths Estimate quantities Tell time, Handle money, Read bar and line graphs Use mathematical notation correctly	Build speed and accuracy in fundamental calculations Strengthen reasoning through mental strategies and number patterns Develop spatial understanding through shape construction and measurement Apply math skills in real-world tasks like time and money handling Interpret information through charts and visual data Communicate mathematical thinking using precise symbols and notation
	Second ary	Solving algebra and geometry problems Analyzing data Using math thinking Apply algebraic manipulation to solve polynomial and rational equations Reason with rigorous geometric proofs Use trigonometric identities in modeling wave phenomena Analyze univariate and bivariate data statistically Model real world systems with exponential and logarithmic functions Solve systems of equations via matrix methods Employ introductory calculus in physical applications Interpret graphs in multiple coordinate systems Use mathematical induction in proof Communicate using standard Japanese mathematical notation	Strengthen fluency in algebraic and geometric problem solving Apply advanced functions and graphs to model dynamic systems Deepen analytical reasoning through proof and logical structures Use statistics to interpret and compare real-world data sets Integrate calculus and trigonometry to analyze change and motion Communicate complex ideas using precise mathematical notation
Vietnam	Basic	Building number skills Exploring basic shapes Using daily math Memorize basic addition subtraction tables Use mental computation, Recognize number sequences Draw and classify shapes Measure with	Strengthen foundational fluency in arithmetic operations Enhance mental agility through number sequences and computation Develop spatial understanding through shape recognition and drawing

		rulers Estimate lengths Read analog clocks, Count currency Interpret pictograms, Use +, −, ×,	Apply measurement and estimation in everyday problem contexts Interpret time, money, and data for functional numeracy Communicate mathematical ideas using symbols and visual formats
	Second ary	Simplifying algebra Understanding graphs Solving logical problems Demonstrate procedural fluency with algebraic and exponential expressions Reason with theorems in plane and analytic geometry Apply trigonometric functions to circular motion Analyze statistical data using standard deviation and correlation Model population growth with exponential and logistic functions Solve systems of linear equations graphically and algebraically Use introductory calculus in economic applications Interpret coordinate transformations Employ geometric constructions with compass and ruler Communicate solutions in Vietnamese mathematical language	Strengthen fluency in simplifying algebraic and exponential expressions Apply geometric theorems to interpret spatial and analytical relationships Use trigonometric and calculus concepts to model dynamic phenomena Analyze data trends and relationships using statistical tools Solve and interpret linear systems using multiple representations Develop precision in geometric constructions and graph interpretation Communicate mathematical reasoning clearly in standardized language
Singapore	Basic	Mastering number sense Understanding shapes Reasoning simply Recall basic facts Use mental strategies Identify and extend patterns Draw shapes accurately Measure lengths/angles Estimate sizes Tell time, Count money, Read pictographs and simple bar graphs Use symbols consistently	Build accuracy and fluency in arithmetic fundamentals Strengthen mental computation and pattern recognition Develop spatial reasoning through precise shape construction Apply measurement and estimation in practical contexts Interpret time, money, and data for everyday numeracy Foster consistency in mathematical communication and symbols Lay foundations for logical thinking and structured problem-solving
	Second ary	Applying algebra and functions Plotting graphs Thinking critically Understand and apply the Concrete–Pictorial–Abstract approach to problem solving Model situations with linear and quadratic functions Use trigonometry in right angled and non-right angled triangles Analyze data using permutations, combinations, and probability Apply calculus concepts (JC1–JC2), Solve problems involving vectors in two and three	Strengthen conceptual understanding through progressive problem-solving representations Model real-life scenarios with algebraic and functional relationships Apply geometric and trigonometric techniques to spatial reasoning tasks Analyze uncertainty using principles of probability and combinatorics Use calculus concepts to understand change and optimization

		dimensions Construct rigorous geometric arguments, Interpret statistical charts and measures	Represent and solve multidimensional problems with vector methods Interpret data patterns and variability using graphical and statistical tools
Malaysia	Basic	Handling numbers Seeing shapes clearly Solving easy math tasks Memorize multiplication tables Use mental math for four operations Recognize arithmetic patterns, Sketch common shapes Measure lengths with rulers Estimate measures, Tell time, Manage currency Read graphs, Apply $+$, $-$, $\times$, $\div$	Strengthen fluency in foundational arithmetic operations Enhance flexibility through mental computation strategies Develop visual reasoning with shape recognition and sketching Apply measurement and estimation in practical contexts Interpret and communicate data using simple graphs Manage real-life tasks involving time and money Use mathematical symbols accurately for clear expression
	Second ary	Working through algebra Reading graphs; Logic in decisions Solve polynomial and rational equations with procedural fluency Model geometry problems using circle and triangle theorems Analyze data sets with measures of central tendency and dispersion Apply trigonometric identities and laws of sines/cosines Construct and interpret linear and quadratic models Solve simultaneous equations using matrices Calculate probabilities for discrete and continuous distributions Use calculus concepts to solve optimization problems Employ coordinate geometry in analytic proofs Communicate mathematical reasoning in Malay and English	Strengthen fluency in algebraic manipulation and symbolic reasoning Model geometric relationships using theorems and coordinate proofs Analyze quantitative data using descriptive statistical techniques Apply trigonometric and calculus tools to solve contextual problems Construct and interpret mathematical models from real-world contexts Solve multi-variable systems using matrix and graphical methods Communicate logical arguments effectively in bilingual mathematical language
S. Korea	Basic	Estimating numbers Recognizing shapes Solving daily problems Recall basic facts quickly, Use mental strategies Identify number patterns Draw shapes with instruments, Measure with rulers Estimate quantities Tell time, Count money Read simple charts Use mathematical notation	Build fluency in arithmetic facts and mental strategies Develop pattern recognition for numerical reasoning Strengthen spatial understanding through geometric construction Apply measurement and estimation in everyday contexts Interpret time, currency, and basic data representations Foster clarity in mathematical expression using correct notation Support problem-solving skills grounded in real-life applications
	Second	Applying algebraic methods	Build fluency in advanced

	ary	Understanding diagrams Problem-based thinking Demonstrate algebraic fluency with complex numbers and polynomials Reason with axiomatic geometry and transformations Apply trigonometric functions to periodic phenomena Analyze data using statistical inference Model real-world scenarios with functions (linear to exponential) Solve systems of linear equations with determinants, Use introductory calculus for rate-of-change and optimization Interpret and sketch parametric and polar graphs Employ logical proof in Euclidean geometry Communicate solutions in precise mathematical Korean notation	algebraic manipulation and symbolic reasoning Apply geometric logic and transformations to prove spatial relationships Use trigonometry and calculus to model periodic and dynamic phenomena Analyze real-world data using probability and statistical inference Model quantitative change through functional and graphical approaches Solve multi-variable systems using determinants and matrix methods Communicate mathematical reasoning using structured Korean notation
UK	Basic	Developing number sense Understanding shapes and space Solving simple problems; Using maths in daily life Recall addition, subtraction, multiplication facts Use mental methods, Spot patterns Draw and label shapes Measure lengths/areas, Estimate sizes, Tell time Use money contexts Interpret pictograms and block graphs Use symbols appropriately	Strengthen number fluency and mental arithmetic strategies Develop spatial understanding through shape drawing and measurement Apply estimation and pattern recognition in everyday problem-solving Interpret data and time for practical decision-making Communicate mathematical thinking using appropriate symbols and visuals
	Second ary	Applying algebra and formulas Interpreting graphs and data Reasoning logically Solving real-world problems Demonstrate fluency in number algebra, geometry and measures Reason mathematically Solve problems with increasing sophistication Understand the formal structure of Mathematics Use mathematical language precisely Interpret and construct graphs and charts Apply trigonometry in context Develop statistical enquiry skills Apply factorization and functions in varied contexts Use calculus concepts in Advanced courses (A-Level)	Strengthen fluency across core mathematical domains and representations Deepen logical reasoning through structured problem-solving Model real-world contexts using algebra, trigonometry, and calculus Analyze and interpret data using statistical and graphical tools Communicate solutions using precise and formal mathematical language

Denmark	Basic	Understanding whole numbers Exploring shapes Solving everyday math problems Memorize arithmetic facts Use mental calculation Recognize patterns, Sketch shapes, Measure lengths Estimate quantities Tell time, Calculate simple money transactions, Read simple graphs Use notation correctly	Build fluency in arithmetic operations and mental strategies Develop spatial reasoning through shape exploration and measurement Strengthen estimation and pattern recognition for problem-solving Apply numeracy in real-life contexts involving time, money, and data Communicate mathematical thinking using symbols and visual tools
	Secondary	Formulating algebraic solutions Interpreting data Making mathematical arguments Solve equations and inequalities with algebraic methods Reason with Euclidean and analytic geometry Apply trigonometric models to periodic contexts Analyze data using modern statistical techniques Model phenomena with differential equations (introductory) Solve linear systems using matrix algebra Interpret and sketch parametric and polar curves Use calculus for optimization problems Employ geometric proofs in both synthetic and analytic form Communicate mathematical ideas clearly in Danish	Develop fluency in symbolic reasoning and algebraic manipulation Apply geometric and trigonometric models to spatial and periodic problems Analyze real-world phenomena through statistical and functional modeling Interpret and represent dynamic systems using calculus and differential methods Communicate structured mathematical arguments using formal language and notation
Germany	Basic	Grasping numbers Recognizing shapes Applying math in routine tasks Recall tables Use mental strategies Identify sequences Draw shapes accurately Measure with standard units Estimate magnitudes Tell time, Handle currency, Interpret bar and line charts, Apply symbols correctly	Develop fluency in arithmetic facts and mental calculation techniques Enhance pattern recognition and numeric sequencing for logical thinking Build spatial reasoning through shape construction and accurate measurement Apply Mathematics in practical contexts involving time, money, and quantities Communicate mathematical ideas clearly using standard symbols and visual tools
	Secondary	Handling algebraic and geometric problems Data analysis Reasoning through models Demonstrate mastery of algebraic structures (rings, fields) at introductory level Reason with rigorous geometric axioms Apply trigonometric identities to solve advanced equations	Develop fluency in advanced algebraic structures and equation solving Apply geometric and analytic reasoning in axiomatic systems Model dynamic systems using calculus, trigonometry, and differential methods

		Analyze data with statistical inference methods Model systems with differential and difference equations Solve linear systems using eigenvalues and eigenvectors Use calculus in theoretical and applied contexts Interpret complex functions in the complex plane Employ formal proof in real analysis Communicate in precise German mathematical terminology	Analyze complex data using statistical inference and multivariate tools Communicate rigorous mathematical arguments with precise formal terminology
Finland	Basic	Building number fluency Understanding shapes Using math in real contexts Use mental strategies for arithmetic Recognize patterns Draw and explore shapes Measure lengths/areas Estimate sizes, Tell time, Manage simple money problems Read charts, Use $+$, $-$, $\times$, $\div$ correctly	Develop fluency in mental calculation and symbolic operations Enhance recognition of numerical and spatial patterns Build foundational understanding of geometric shapes and measurements Apply Mathematics in daily tasks involving time, money, and estimation Interpret visual data and express ideas using correct mathematical notation
	Second ary	Solving algebra problems Working with graphs Justifying answers Demonstrate adaptive use of algebraic and numeric methods Reason with geometric and phenomenon-based contexts Apply trigonometric functions to real-life modeling Analyze data with modern statistical software Model dynamic systems with differential equations Solve linear systems using matrix computation Use calculus in Technology and ecology applications Interpret and visualize multivariable functions Employ proof in both informal and formal settings Communicate findings in Finnish	Strengthen fluency in symbolic reasoning and quantitative modeling Apply mathematical tools to interpret scientific and ecological phenomena Analyze real-world data using functions, graphs, and software-based methods Develop logical coherence through formal and informal mathematical proofs Communicate mathematical insights precisely in Finnish academic contexts
Tanzania	Basic	Learning basic numbers Seeing shapes Solving everyday problems Memorize basic facts Use mental calculation Identify number patterns Draw shapes manually, Measure lengths Estimate quantities	Develop fluency in arithmetic operations through recall and mental strategies Enhance reasoning through number pattern recognition and estimation Build spatial understanding via manual shape construction and measurement

		Tell time, Count money, Read pictograms Use notation correctly	Apply mathematical concepts in real-life contexts involving time and money Communicate ideas effectively using symbols and simple data visuals
	Second ary	Working with algebraic ideas Handling graphs Using logical steps Perform algebraic manipulations with polynomials and rational expressions Apply Euclidean geometry theorems Use trigonometric ratios in surveying contexts Analyze data using descriptive statistics Model population growth with simple exponential functions Solve systems of equations graphically Interpret scatter plots and regression lines Employ introductory calculus in economics Apply measurement in agricultural settings Communicate mathematical solutions clearly	Develop fluency in algebraic procedures and symbolic reasoning Apply geometric, trigonometric, and measurement concepts to spatial tasks Analyze relationships in data using graphs, statistics, and regression Model and interpret growth and change using functions and basic calculus Communicate structured mathematical arguments with clarity and relevance
South Africa	Basic	Strengthening number skills Understanding shapes Applying math to daily challenges Recall addition, subtraction, multiplication tables Use mental methods Recognize patterns Draw and classify shapes, Measure with non-standard and standard units, Estimate Tell time, Handle money Read tally and bar charts Use symbols	Strengthen fluency and confidence in arithmetic operations and recall Enhance problem-solving through mental strategies and pattern recognition Build spatial reasoning via shape construction and classification Apply measurement and estimation in everyday real-life tasks Communicate numeracy using appropriate symbols and simple data displays
	Second ary	Applying algebra and functions Working with graphs Thinking logically Demonstrate procedural fluency with algebraic and exponential expressions Reason with analytic geometry Apply trigonometric identities in wave contexts Analyze data using inferential statistics Model resource consumption with linear and logistic functions, Solve systems of equations using matrix methods Use calculus concepts for optimization Interpret and draw parametric and polar graphs Employ proof in both synthetic and analytic forms Communicate solutions in multi-lingual settings	Develop fluency in algebraic reasoning and functional modeling Apply geometric and trigonometric methods to spatial and real-world contexts Analyze trends and variability using graphical and statistical tools Use calculus and matrices to solve complex optimization and system problems Communicate mathematical arguments clearly across linguistic contexts
Brazil	Basic	Building number sense Recognizing shapes	Develop fluency in arithmetic through recall and mental

		Using math in everyday life Memorize basic arithmetic facts Apply mental strategies Identify number sequences Draw shapes, Measure lengths, Estimate Tell time, Handle real and centavos, Read simple graphs, Use symbols correctly	computation Enhance numerical reasoning via pattern recognition and estimation Build spatial awareness through shape construction and measurement Apply Mathematics in practical contexts involving time, currency, and everyday tasks Communicate ideas clearly using standard symbols and basic data representations
	Secondary	Solving algebra problems Analyzing data Logical decision-making Apply algebraic methods to solve linear and quadratic equations Reason with geometric constructions Use trigonometric models in engineering contexts Analyze data using statistical and probabilistic tools Model population dynamics with differential equations Solve linear systems with matrix approaches Employ calculus in environmental modeling Interpret and sketch parametric curves Use formal proof technique Communicate findings in Portuguese	Strengthen fluency in algebraic procedures and equation solving Apply geometric and trigonometric reasoning in technical contexts Analyze variability and chance using data, statistics, and probability Model growth and change using functions and differential methods Solve multivariate systems using matrix operations and vector logic Communicate structured mathematical arguments in formal Portuguese
USA	Basic	Gaining number fluency Exploring shapes Solving simple math problems Recall basic facts Use mental math and calculators Recognize patterns Draw shapes, Measure lengths, Estimate quantities, Tell time, Count money, Interpret bar and line graphs, Use notation correctly	Build fluency in core arithmetic through recall and computation strategies Strengthen reasoning through pattern recognition and estimation Develop spatial understanding via shape drawing and measurement Apply math skills in daily contexts involving time and money Interpret visual data using graphs and basic data representations Communicate clearly using consistent mathematical notation
	Secondary	Working with algebra and functions Interpreting graphs and stats Reasoning mathematically Apply and extend previous understandings of functions to model relationships between quantities Interpret and build functions (linear, quadratic, exponential) Use right triangle trigonometry, Understand similarity congruence, and proofs Analyze data using statistical thinking Apply the Pythagorean theorem Develop fluency with complex numbers (Advanced courses)	Develop functional reasoning through algebraic modeling and analysis Apply geometric relationships to solve spatial and proof-based problems Use trigonometric and calculus tools to represent change and structure Analyze real-world data through graphical and statistical approaches Strengthen fluency in advanced number systems and matrix computation

		Use derivatives and integrals in modeling (AP Calculus) Employ matrix operations	Communicate logical mathematical arguments with precision and structure
Canada	Basic	Improving number sense Learning shapes Using math in real contexts Memorize arithmetic facts Use mental strategies Identify number patterns Draw shapes, Measure with rulers, Estimate lengths Tell time, Handle currency, Read simple graphs, Use math symbols	Build fluency in arithmetic through recall and mental computation Enhance numerical reasoning using patterns and estimation Develop spatial understanding through shape drawing and measurement Apply mathematical thinking in real-life tasks involving time and money Interpret data using basic graphs and visual representations Communicate clearly using appropriate mathematical symbols and language
	Secondary	Solving algebra/geometry problems Reading graphs and stats Applying math logic Demonstrate fluency with algebraic and exponential expressions Reason with coordinate and transformational geometry Apply trigonometry in surveying and navigation Analyze data using probability and statistics Model ecological and economic systems with differential equations Solve systems of equations using matrix methods Use calculus in physical and biological applications Interpret multivariable functions, Employ proof in advanced courses Communicate in English and French mathematical contexts	Strengthen fluency in algebraic, exponential, and functional reasoning Apply geometric and trigonometric tools in spatial and navigational contexts Analyze uncertainty and variation using statistical and probabilistic methods Model complex systems using differential equations and multivariable functions Solve multivariate problems through matrix techniques and logical strategies Communicate precise mathematical arguments in both official languages
Australia	Basic	Learning numbers Understanding shapes Solving everyday tasks Recall addition, subtraction, multiplication tables, Use mental math, Recognize sequences Draw and classify shapes Measure lengths and areas, Estimate sizes Tell time, Use money contexts, Read pictographs and bar graphs, Use symbols correctly	Build number fluency through recall, mental strategies, and pattern recognition Develop spatial awareness via shape exploration and accurate measurement Apply estimation and visual representation to support everyday problem-solving Strengthen real-life numeracy using time and currency contexts Interpret data using pictographs, bar graphs, and simple statistics Communicate clearly using consistent mathematical symbols and language

	Secondary	Using algebra and graphs Understanding functions Solving contextual problems Demonstrate procedural fluency with algebraic and rational expressions Reason with Euclidean and coordinate geometry Apply trigonometric functions to real-world contexts Analyze data using descriptive and inferential statistics Model systems with differential equations Solve linear systems using matrix methods Use calculus for rates of change and area under curves Interpret and sketch parametric and polar graphs Employ proof in both formal and informal settings Communicate mathematical ideas in English	Build number fluency through recall, mental strategies, and pattern recognition Develop spatial awareness via shape exploration and accurate measurement Apply estimation and visual representation to support everyday problem-solving Strengthen real-life numeracy using time and currency contexts Interpret data using pictographs, bar graphs, and simple statistics Communicate clearly using consistent mathematical symbols and language
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Appendix H: Contents in Mathematics subject across all countries

Country	Level	Contents	Special Features
Nepal	Basic Secondary	The concept of numbers and figures, as well as the development and application of practical mathematical knowledge and practical mathematical skills. Geometry Arithmetic Measurement Statistics Algebra Set, Arithmetic Mensuration, Algebra Geometry, Statistics	Basic math classes begin with outdoor “number hunts” where students measure local features, tree heights, path lengths, using rulers and meter sticks. In teams they collect data, create pictographs and bar charts, and present their findings to the class. Storytelling circles connect arithmetic concepts to local folklore, making numbers memorable. Weekly maker-space sessions let learners build geometric models with clay, paper strips, and recycled materials. Technology corners allow small groups to visualize fractions and angles with interactive apps.
India	Basic	Numbers to 1000; Addition/subtraction of 3 and 4 digit numbers; Multiplication tables; Simple fractions; Geometry (lines, angles, shapes); Measurement (length, mass, capacity); Time and calendar; Money; Data handling (pictographs)	Secondary students apply measurement and statistics in real-world projects, such as surveying schoolyard drainage patterns and modeling water flow. They use geometry and mensuration to design scale models of local landmarks, calculating areas and volumes. Collaborative data-analysis workshops teach them to clean, graph, and interpret large datasets in spreadsheets. Proof-writing seminars develop rigorous reasoning in algebra and calculus. Cross-disciplinary capstone projects link Mathematics with environmental Science and local development planning.
	Secondary	Grade 9–10: Linear and quadratic equations; Polynomials; Coordinate geometry; Trigonometry; Mensuration; Statistics and probability. Grades 11–12 (Elective): Differential and integral calculus; Vectors; Matrices; Relations and functions; Statistics and probability	Indian Basic lessons kick off with “math melas,” where students showcase hand-crafted abaci and fraction wheels made from local materials. Folk-tale problem statements frame arithmetic operations in cultural contexts. Outdoor market simulations reinforce money handling and measurement in length, weight, and capacity. Peer-teaching pods rotate roles so every learner practices explaining and demonstrating multiplication tables and simple fractions. Mobile-lab vans bring tablet-based interactive geometry and data-handling games to rural schools, ensuring equitable access.
Bhutan	Basic	Numbers 1–100; Addition/subtraction within 100; Introduction to multiplication/division; Fractions (half, quarter); Basic shapes; Measurement (length, weight); Time; Money; Data (bar graphs); Patterns	Secondary classes follow CBSE-style lab practical where students verify trigonometric identities using pendulums and ripple-tanks. Model-making workshops guide teams in constructing scaled replicas of monuments to practice coordinate geometry and mensuration. Guest lectures by engineers illustrate real-world calculus applications in bridge design and structural analysis. Students collaborate on digital

			poster presentations, visualizing data with GIS overlays. Regular timed mock exams build exam stamina and reinforce problem-solving under pressure.
	Secondary	Quadratic and simultaneous equations; Coordinate geometry of lines and circles; Trigonometry (sine, cosine, tangent); Sequences and series; Statistics (mean, median, mode, standard deviation); Probability calculations; Mensuration of prisms, pyramids, cylinders; Linear programming; Matrices for simple applications; Mathematical reasoning and proof techniques	Bhutanese Basic math lessons open with group mindfulness chants linking gratitude with patterns in nature. Learners conduct forest walks to classify leaves and stones by shape and size, reinforcing measurement vocabulary. “Happiness journals” combine reflective writing with tracking daily numerical observations. Simple herbal-tea recipes use fractional measurements for hands-on cooking experiments. Community garden projects teach data collection and bar-graphing of plant growth rates.
Bangladesh	Basic	Numbers up to 1000; Four operations; Basic fractions; Geometry (lines, shapes); Measurement (length, weight, capacity); Time and calendar; Money; Data handling (tally charts, pictographs); Patterns and sequences	Secondary students visit hydropower plants to measure turbine output and apply quadratic equations to calculate energy generation. They conduct field research on forest regeneration, using statistics to analyze tree-growth data. Stoichiometry labs on herbal extraction reinforce algebra and chemical reasoning. Peer-review workshops develop proof-writing and mathematical argumentation skills. Capstone projects integrate traditional knowledge with advanced modeling to propose sustainable community initiatives.
	Secondary	Linear, quadratic, polynomial and rational functions; Coordinate geometry of points and lines; Trigonometric identities and equations; Exponential and logarithmic functions; Data handling and probability; Circle theorems; Vectors in two dimensions; Geometric constructions; Surface area and volume of solids; Introduction to limits	Bangladeshi Basic math begins with flood-modeling tabletop exercises, teaching volume and rate through hands-on canal simulations. Students build and monitor simple weather stations from recycled materials to collect real-time data. Sundarbans folklore circles reinforce pattern recognition and sequencing in a cultural context. Community water-filter demos integrate division and fraction concepts with public health. Clay-model kits guided by local artisans make geometry tactile and accessible.
Sri Lanka	Basic	Whole numbers; Four operations; Fractions ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$); Geometry (shapes, symmetry); Measurement (length, area); Time; Money; Data handling (pictographs); Patterns	Secondary learners conduct salinity tests in wetland field labs and use probability to analyze water-quality data. Cyclone-drills incorporate statistical forecasting lessons. GIS mapping workshops teach coordinate geometry through satellite imagery interpretation. Debates on coastal protection policies develop persuasive mathematical arguments. Yearly research symposiums showcase student-created posters evaluated by regional scientists.
	Secondary	Algebraic expressions and equations; Coordinate geometry of lines, circles and parabolas; Plane Euclidean geometry;	Sri Lankan Basics plant seeds in classroom gardens, measuring growth rates and plotting data in journals. Tea-estate visits illustrate area and volume calculations in agricultural contexts.

		Trigonometric ratios and identities; Matrices and determinants; Differential calculus (introduction to derivatives); Probability distributions; Statistics (scatter plots, regression); Solid mensuration; Functions and their graphs	“Healthy living” campaigns integrate water-use statistics with creative poster design. Folk-dance pattern exercises reinforce symmetry and sequence vocabulary. Student-led weather-report broadcasts sharpen both data interpretation and oral communication skills.
China	Basic	Numbers to 10 000; Four operations; Basic fractions and decimals; Geometry (lines, shapes); Measurement (length, mass); Time; Money; Data handling (simple charts); Patterns	Secondary learners set up hydroponic systems and apply algebra to optimize nutrient flow rates. Coastal erosion field trips link geometry to environmental Science in situ. Tea processing tours demonstrate calculus applications in process engineering. Poetry slams on mathematical themes encourage creative expression of complex concepts. Structured debate tournaments refine formal mathematical language and analytical reasoning.
	Secondary	Senior Middle School (Grades 10–12): Algebra (functions, polynomials); Geometry (proof, circles, conics); Trigonometry; Probability and statistics; Matrices and determinants; Calculus (limits, derivatives, applications); Complex numbers; Sequences and series	Chinese Basic classes follow standardized “red-book” experimental protocols for consistency. Robotics club demonstrations connect arithmetic to programming logic in real machines. Eco-campus tree-count projects reinforce large-number fluency. Peer pronunciation circles blend English math vocabulary with Mandarin phonetics. Interactive digital labs visualize decimals and fractions in three dimensions for deeper conceptual understanding.
Japan	Basic	Numbers to 10 000; Four operations; Fractions and decimals; Geometry (angles, shapes); Measurement (length); Time; Money; Data handling (bar/line graphs); Patterns	Gaokao-style timed drills prepare students for national exams, building speed and accuracy. Students visit semiconductor fabrication centers to apply matrix algebra in circuit design. Environmental monitoring projects use calculus to model pollution trends. Robotics competitions integrate algebraic and geometric problem solving. University-sponsored seminars deepen proof-writing and advanced mathematical discourse.
	Secondary	Algebraic expressions; Equations and inequalities; Coordinate and Euclidean geometry; Trigonometry; Data analysis and probability; Matrices and determinants; Differential and integral calculus; Sequences and series; Graph theory basics; Advanced proof techniques	Japanese Basics begin with seasonal “matsuri” themes, cherry blossoms and fireworks, to teach data collection and graphing. Calligraphy sessions pair kanji with English math symbols to reinforce written numeracy. Robotics club visits illustrate gear ratios and arithmetic in mechanical contexts. Precision-instrument workshops guide students in mastering protractor and compass use. Reflection circles conclude each unit, allowing learners to articulate problem-solving strategies verbally.
Vietnam	Basic	Numbers up to 10 000; Four operations; Fractions; Geometry (shapes); Measurement (length, capacity); Time; Money; Data handling (pictograms); Patterns	Students participate in earthquake-simulation labs applying trigonometry and calculus. NanoTechnology workshops introduce complex number operations and matrix applications. Tsunami-modeling software projects use

			sequences and series for predictive simulations. Precision instrumentation labs teach advanced measurement methods. Annual math symposiums feature student presentations and peer critiques, fostering academic and professional discourse.
	Secondary	Functions (polynomial, rational, exponential, logarithmic); Coordinate geometry of conics; Trigonometry (identities, equations, applications); Statistics and probability; Matrices and determinants; Differential calculus (limits, derivatives); Logistic and exponential models; Solid geometry; Geometric constructions; Proof methods	Vietnamese Basics start in rice paddies, where students map planting grids and calculate areas. Bilingual word-walls display terminology in both Vietnamese and English for dual-language fluency. Community Science festivals invite families to hands-on measurement challenges. Mobile lab buses bring microscopes and data-loggers to remote schools. Village elders share traditional counting systems, linking math learning to cultural heritage.
Singapore	Basic	Whole numbers; Addition/subtraction; Multiplication/division; Fractions and decimals; Geometry; Measurement; Time; Money; Data handling (pictographs, bar graphs); Patterns	Secondary classes partner with NGOs on rice-paddy ecology projects using logistic growth models. Water-management simulations employ differential equations with real community data. Agroforestry internships teach sustainable land-use planning through geometric and statistical analysis. GIS mapping workshops introduce coordinate geometry in disaster planning. Capstone projects present data-driven proposals for local development to community stakeholders.
	Secondary	Secondary 1–2: Number skills; Algebraic techniques; Geometry; Data handling. Secondary 3–4 (O-Level): Functions and graphs; Trigonometry; Statistics and probability; Coordinate geometry; Vectors; Additional algebra. JC1–2 (A-Level): Calculus; Statistics; Mechanics (mathematical methods).	Singapore Basics use CPA stations, Concrete manipulative, Pictorial diagrams, then Abstract notation, ensuring deep conceptual understanding. SLS digital platforms deliver adaptive quizzes and interactive games at each student's pace. Urban hydroponics labs demonstrate measurement and data-logging in real-world STEM contexts. National STEM clubs host annual math competitions that foster collaboration and healthy rivalry. Smart Nation dashboards visualize class progress, motivating learners with real-time feedback.
Malaysia	Basic	Numbers to 10 000; Four operations; Fractions and decimals; Geometry (shapes, angles); Measurement; Time; Money; Data handling (graphs); Patterns	JC math societies offer enrichment tutorials on mechanics and graph theory. Vertical farm research modules apply calculus to nutrient flow and energy modeling. Industry mentors from Smart Nation projects guide student capstone developments. National Olympiad training camps prepare high achievers in advanced proof and modeling techniques. E-portfolios document and reflect each learner's progression from foundational to sophisticated mathematical applications.
	Secondary	Functions (linear, quadratic, exponential, logarithmic); Coordinate and vector geometry; Trigonometry	Malaysian Basics alternate between Malay and English instruction to build bilingual numeracy skills. Community garden partnerships allow students to plan planting grids and calculate areas,

		(identities, equations, solutions of triangles); Statistics (probability, distributions, hypothesis testing); Matrices and determinants; Differential and integral calculus (basic techniques and applications); Geometric constructions; Mathematical proof methods	integrating geometry with environmental stewardship. Festival-themed pattern projects, like batik designs, tie cultural celebrations to mathematical concepts. Mobile Science labs bring manipulatives to rural schools, ensuring equitable hands-on learning. Classroom math corners display student-created infographics on local weather and biodiversity data.
S. Korea	Basic	Numbers to 10 000; Four operations; Fractions; Geometry; Measurement; Time; Money; Data handling (charts); Patterns	Secondary classes conduct ecotourism field trips to collect data and apply vector geometry in trail mapping. Peatland restoration workshops teach conservation through statistical analysis of carbon data. Herbal garden labs explore botanical fractions and ratios in natural product formulations. Interfaith stewardship seminars foster respectful data-driven discussions of environmental ethics. Digital storytelling projects empower learners to present complex mathematical models through multimedia narratives.
	Secondary	Complex numbers and polynomial theorems; Euclidean and transformational geometry; Trigonometric functions and graphs; Statistics (sampling, estimation, hypothesis testing); Functions and their applications; Systems of equations and determinants; Calculus (limits, derivatives, basic integrals); Parametric, polar and vector graphs; Mathematical proofs	South Korean Basics follow the 5E model (Engage, Explore, Explain, Elaborate, Evaluate) for inquiry-based learning. K-Pop lyric analysis lessons teach sequence and pattern recognition through song. AR-powered labs let students manipulate virtual 3D graphs and surfaces. Annual STEM festivals showcase student-built mathematical models and data visualizations. Peer-teaching clinics rotate roles so each learner practices both explaining and listening, reinforcing collaboration and communication skills.
UK	Basic	Numbers and place value; Four operations; Fractions (unit and non-unit); Geometry (shapes, symmetry); Measurement; Time; Money; Data handling (pictograms, block graphs); Patterns	Learners visualize multivariable calculus in AR/VR environments to grasp functions of two variables. Clean-room visits to semiconductor plants illustrate complex number applications in electronics. Maker-space challenges foster entrepreneurial design thinking by building optimized robotics models. National math camps deepen understanding of advanced proof techniques and research methodologies. Academic symposiums develop formal presentation skills and peer-review practices.
	Secondary	Key Stage 4 (GCSE): Number; Algebra; Ratio, proportion and rates of change; Geometry and measures; Probability; Statistics. A-Level: Pure Mathematics (algebra, functions, calculus, trigonometry, vectors), Applied Mathematics (mechanics, statistics).	UK Basics often start with excursions to local museums or parks, where students collect real-world data for number and measurement activities. The “Curiosity Approach” frames topics as open-ended enquiries, empowering learners to drive their own investigations. Role-play shopping scenarios teach ratio and proportion in practical contexts. Cross-curricular art projects, such as creating fractal murals, deepen spatial reasoning. Citizen-Science partnerships engage families in community

			data-gathering and analysis projects.
Denmark	Basic	Numbers to 10 000; Four operations; Fractions; Geometry; Measurement; Time; Money; Data handling (graphs); Patterns	Students conduct biodiversity surveys in nearby nature reserves, applying statistical methods to analyze species distributions. Policy-brief workshops simulate advising local councils using probability models and risk assessments. Virtual-reality excursions transport learners inside molecular structures to explore geometry in chemistry. Debate leagues refine logical argumentation around proofs and theorems. Field-notebook portfolios document extended project work and support reflective practice.
	Secondary	Algebra: polynomials, rational functions; Geometry: Euclidean and analytic; Trigonometry; Statistics and probability; Matrices and linear algebra; Differential and integral calculus; Parametric, polar and vector functions; Complex numbers; Mathematical proof techniques; Numeric methods	Danish Basics embrace Friluftsliv—outdoor lessons in forests and fields where students measure tree heights, map trails, and record environmental data. Maker-house workshops allow learners to craft simple machines, reinforcing geometry and measurement concepts. Sustainability modules link Mathematics to recycling and circular-economy case studies. Student-led debates on community data foster analytical reasoning and civic engagement. Art–Science collaborations, such as designing eco-murals, enrich numerical understanding through creativity.
Germany	Basic	Whole numbers; Four operations; Fractions; Geometry; Measurement; Time; Money; Data handling (bar/line charts); Patterns	Germany’s “Sachunterricht” maker-kits empower hands-on investigations—students build scale bridges and towers to explore geometry and structural forces. Urban ecology walks connect classrooms to city parks and waterways for real-world data collection. Research-seminar series teach students how to present their mathematical findings in formal settings. STEM-career expos introduce applications of measurement and calculation in engineering fields. Science-theatre productions dramatize proof techniques in an engaging format..
	Secondary	Algebra: groups, rings, fields (introductory); Geometry: Euclidean, projective; Trigonometry; Probability and statistics; Linear algebra (matrices, eigenvalues); Differential and integral calculus; Complex analysis basics; Differential equations; Mathematical logic and proof	. Secondary classes host policy hackathons, where students model sustainable energy systems using differential equations. NGO partnerships bring real-world datasets on social issues into statistics lessons. Circular-economy projects challenge learners to optimize resource flows mathematically. Interdisciplinary symposiums link math to design thinking and social Science. Renewable-energy demos illustrate applied calculus and measurement in practical contexts
Finland	Basic	Numbers; Four operations; Fractions and decimals; Geometry; Measurement; Time; Money; Data handling (charts); Patterns	Finnish Basics use phenomenon-based learning, tackling real problems—like tracking local weather patterns—through multi-day projects that integrate measurement and data analysis. Mobile-lab buses bring high-tech equipment to remote and urban schools alike, ensuring equity. Eco-design workshops merge Mathematics with

			sustainable architecture concepts. Digital portfolios allow learners to curate and reflect on their mathematical journeys. Group projects emphasize collaboration in data-collection and shared inquiry.
	Secondary	Functions and relations; Geometry in plane and space; Trigonometry; Statistics and probability; Linear algebra; Differential and integral calculus; Multivariable calculus (introductory); Differential equations; Mathematical modeling; Proof techniques	Learners conduct engine-performance tests in industry labs, applying differential equations and statistical analysis to real systems. University partnerships offer seminars on complex analysis and abstract algebra. Maker-space challenges foster entrepreneurial thinking, requiring optimized designs rooted in mathematical proofs. Science fair sponsorships celebrate outstanding work in mathematical modeling. Peer-review workshops develop rigorous proof-writing and academic communication skills.
Tanzania	Basic	Numbers up to 10 000; Four operations; Fractions; Geometry; Measurement; Time; Money; Data handling (pictograms); Patterns	Tanzanian Basics open with community-health labs where students map disease incidence using tally charts and bar graphs. Local-materials workshops teach resource-efficient measurement methods with seeds, sticks, and stones. Agro-Science camps connect agriculture and math via crop yield calculations. Traditional-knowledge seminars honor indigenous counting systems and pattern designs. Mobile-Science roadshows transmit hands-on experiments and data-collection tools to rural schools
	Secondary	Algebraic expressions; Equations and inequalities; Coordinate and Euclidean geometry; Trigonometry; Statistics (mean, median, mode, variance); Probability; Functions (linear, quadratic, exponential); Matrices; Differential calculus basics; Mensuration for agriculture	. Secondary classes undertake climate-adaptation modeling, applying differential equations to predict local environmental changes. Multivariable calculus labs use drone-collected data to study geographical features. Research symposiums nurture peer-reviewed presentations of student work. Interdisciplinary labs link Mathematics to Technology and social-Science issues. Open-access digital platforms facilitate cross-school collaborations on advanced mathematical modeling projects.
South Africa	Basic	Numbers and place value; Four operations; Fractions; Geometry; Measurement; Time; Money; Data handling (tally/bar charts); Patterns	South African Basics employ Ubuntu learning circles to foster collaborative inquiry, with peers supporting each other's mathematical growth. Community-Science festivals engage families in building measuring devices and completing data challenges. Indigenous-knowledge labs merge traditional ecological wisdom with modern arithmetic tasks. Ethics-inquiry workshops explore fairness and representation in data collection. Mobile labs ensure that STEM learning reaches township and rural schools equitably.
	Secondary	Functions and relations; Algebraic equations; Geometry; Trigonometry; Probability and statistics; Matrices and	Secondary learners design and conduct mosquito-habitat surveys, applying probability and statistics for malaria prevention. Field studies teach mensuration techniques relevant to

		determinants; Differential and integral calculus; Parametric and polar functions; Mathematical proof methods; Financial Mathematics applications	agricultural planning. Research-methodology workshops instill rigor in modeling and data analysis. NGO collaboration labs demonstrate applied Mathematics in community development projects. Final presentations to local leaders use proof-based proposals for sustainable agriculture and rural resource management.
Brazil	Basic	Numbers and operations; Place value; Addition/subtraction; Multiplication/division; Fractions and decimals; Geometry (shapes, area); Measurement; Time; Money; Data representation (graphs); Patterns	Brazilian Basics leverage PNAIC literacy-math integration, pairing reading comprehension with numeracy tasks in community libraries. Amazon biodiversity labs connect geometry and data-analysis to local ecology and conservation efforts. Carnival-Science art workshops merge cultural expression with pattern recognition and symmetry. Community-engagement labs teach mapping and measurements in urban favelas. Bio-diversity fairs showcase student research on native species and foster civic pride.
	Secondary	Algebraic functions; Geometry; Trigonometry; Probability and statistics; Matrices; Differential and integral calculus; Differential equations; Solid geometry; Mathematical modeling; Proof methods	Secondary classes run water-purification trials, applying algebra and calculus to model pollution removal rates. Urban heat-island modeling projects use statistical analysis of temperature data across city neighborhoods. Environmental justice forums integrate mathematical modeling with social-Science perspectives to propose community solutions. Community health labs collect and analyze epidemiological statistics for local clinics. Peer-review showcases at civic centers celebrate student research and foster public engagement.
USA	Basic	Numbers and operations; Place value; Addition/subtraction; Multiplication/division; Fractions and decimals; Geometry (shapes, area); Measurement; Time; Money; Data representation (graphs); Patterns	US Basic classes follow the NGSS 5E model—students Engage with real-world phenomena, Explore through hands-on investigations, Explain their reasoning, Elaborate in STEAM projects, and Evaluate via reflection and peer feedback. Maker-spaces and 3D printers allow learners to prototype geometric models and physical representations of math concepts. NASA partnerships bring live satellite data into lessons, inspiring exploration of orbital mechanics and metrics. STEM mentorships connect underrepresented youth with role models. Community Science fairs connect K–12 learners to university research labs.
	Secondary	Algebra I & II: Linear, quadratic, polynomial, rational and exponential functions; Geometry: Congruence, similarity, proof, circles; Trigonometry: Unit circle, identities; Pre-Calculus: Advanced functions, matrices; Calculus (optional): Limits, derivatives, integrals, applications; Statistics:	Secondary learners conduct canopy research in the Amazon, applying differential equations to model carbon flux in ecosystems. Agroforestry design workshops use matrices to optimize planting patterns and resource allocation. NanoTechnology internships introduce complex analysis and advanced proof techniques. Indigenous community collaborations integrate traditional counting systems with modern geometry. National sustainability hackathons challenge students to develop data-driven

		Probability, data analysis	solutions for environmental stewardship
Canada	Basic	Numbers; Operations; Fractions; Geometry; Measurement; Time; Money; Data handling (graphs); Patterns	Canadian Basics leverage provincial inquiry frameworks that champion student-driven questions and authentic investigations. Indigenous collaborations integrate land-based counting and measurement traditions into modern curricula. Bilingual (English/French) exhibits support dual-language mathematical literacy. Regional research fairs showcase student projects on local environmental challenges like water-quality monitoring. Digital-storytelling labs combine data visualization with narrative techniques to deepen conceptual understanding.
	Secondary	Functions: polynomial, rational, exponential, logarithmic; Geometry: analytic, Euclidean, transformational; Trigonometry; Statistics and probability; Matrices; Calculus (single and multivariable); Differential equations; Mathematical modeling; Financial Mathematics; Proof techniques	Secondary programs integrate calculus and statistics into authentic research projects on climate change, epidemiology, and urban planning. FabLab workshops teach mathematical design thinking through prototyping robotic and architectural models. Research symposiums develop peer-review and academic discourse skills akin to professional conferences. Industry mentorships bridge classroom learning with applications in finance, tech, and engineering. Publication clinics guide students in writing, submitting, and presenting formal research reports at youth Science journals.
Australia	Basic	Functions and algebra; Geometry and measurement; Trigonometry; Probability and statistics; Matrices and linear algebra; Differential and integral calculus; Differential equations; Parametric and polar functions; Mathematical proof methods; Financial Mathematics applications	Australian Basics follow ACARA's "Science as a Human Endeavour" strand, situating math within local contexts like reef health, bushfire patterns, and outback exploration. Outback expeditions teach students to measure distances and map terrain using trigonometry and geometry. Marine-survey projects in the Great Barrier Reef integrate data-analysis and statistical reporting. Indigenous-knowledge integration honors First Nations' mapping traditions and seasonal calendars. connect classrooms with conservation organizations and community research efforts.
	Secondary	Functions and algebra; Geometry and measurement; Trigonometry; Probability and statistics; Matrices and linear algebra; Differential and integral calculus; Differential equations; Parametric and polar functions; Mathematical proof methods; Financial Mathematics applications	Secondary learners partner with Indigenous communities to model climate impacts using differential equations and statistical analysis. Citizen-Science platforms link students to national research initiatives in ecology and public health. Policy-brief workshops teach data-driven advising for local and provincial decision makers. IB and AP lab modules immerse students in advanced statistical, calculus, and modeling methods. Mentorship programs guide student capstones toward publication and presentation at academic symposia.

Appendix I: Competencies in Science Subject across the Countries

Country	Level	Competencies	Special Features
Nepal	Basic	Identification/use of energy, air, water characteristics; Surroundings & weather awareness; Environmental health; Creative arts presentations; Biodiversity conservation; Procedural skills; Modeling with local materials; Biodiversity interrelationships; Force/tool use; Matter properties; Earth & space concepts	hands-on exploration; field-based investigations; peer-led discussions; tech-enhanced experiments; arts-integrated demos
	Secondary	Research skills development; Science–tech limitations; Environmental interrelationships; Classification/life sequencing; Physical process analysis; Universe origins; ICT-aided learning; Matter analysis; Chemical usage; Traditional practices	project mentoring; interdisciplinary labs; field studies; digital analysis; peer-review workshops
India	Basic	Specimen observation; Question framing; Instrument use; Hands-on investigations; Systematic recording; Classification; Interpretation; Contextual application; Peer sharing	low-cost materials use; cultural storytelling; peer circles; mobile labs; festival fairs
	Secondary	Biotech/space hypotheses; Microbiology/chemistry experiments; Bunsen burner safety; Monsoon data analysis; Pollution interpretation; Physics in crafts; Report critique; Energy modeling; Poster communication; Math integration	model workshops; board practicals; Science fairs; lab exchanges; simulation modules
Bhutan	Basic	Pattern noticing; Why/how questioning; Field/class planning; Apparatus handling; Observation tabulation; Grouping; Cause–effect inference; Cultural linkage; Clear presentation	GNH projects; herbal integration; garden labs; wellness workshops; cross-crafts
	Secondary	Happiness–environment hypotheses; Forest regeneration experiments; Herbal extract safety; Hydropower measurement; Carbon data analysis; GNH applications; Conservation critique; Hydropower modeling; Community communication; Traditional knowledge	field trips; plant visits; heritage studies; research symposiums; craft workshops
Bangladesh	Basic	Change observation; Query posing; Investigation design; Kit usage; Table/chart recording; Group comparison; Inference drawing; Community relevance; Reporting	flood outreach; river labs; cyclone drills; sensor demos; ecology walks
	Secondary	Flood hypotheses; Water tests; Wetland kit safety; Cyclone data analysis; Salinity interpretation; Mitigation application; Coastal critique; Hydrology modeling; Risk communication; GIS use	field labs; mapping workshops; engineering demos; drill simulations; imagery sessions
Sri Lanka	Basic	Careful observation; Hypothesis formulation; Hands-on activities; Safe handling; Journaling; Classification; Analysis; Local application; Description	tea-garden labs; school gardens; heritage experiments; weather tracking; craft demos
	Secondary	Soil hypotheses; Yield experiments; Glassware safety; Variability analysis; Disease data interpretation; Processing application; Erosion critique; Hydroponic modeling; Report communication; Indigenous integration	practical drills; field visits; extension collaborations; eco internships; lab exchanges
China	Basic	Systematic observation; Questioning; Experiment planning; Instrument proficiency; Accurate recording; Categorization; Explanation; Everyday	“red-book” protocols; curriculum clinics; tech simulations; industry tours;

		use; Communication	lab swaps
	Secondary	Pollution hypotheses; Advanced titrations; Fume-hood safety; Heat-island analysis; Semiconductor study; Rail physics; Emission critique; Climate modeling; Technical reporting; Robotics use	Gaokao drills; industry visits; robotics labs; monitoring projects; journal workshops
Japan	Basic	Phenomena observation; Question phrasing; Group investigations; Tool operation; Data logging; Sorting; Pattern interpretation; Societal linkage; Presentation	lesson study; calligraphy integration; robotics demos; precision labs; peer reflection
	Secondary	Agri-robotics hypotheses; Materials experiments; Sensor safety; Seismic analysis; Nanotech interpretation; Engineering application; City critique; Tsunami modeling; Tech communication; ICT integration	precision modules; robotics rotations; quake drills; nanotech workshops; ICT tours
Vietnam	Basic	Event observation; “What if” questioning; Guided experiments; Measurement use; Table recording; Classification; Evidence conclusions; Farm application; Reporting	delta field trips; bilingual labs; Science festivals; lab diaries; language integration
	Secondary	Ecology hypotheses; Aquaculture tests; Kit safety; Typhoon analysis; Nutrient interpretation; Sustainable farming; Restoration critique; Hydraulics modeling; Farmer communication; Traditional practices	case studies; simulations; agro internships; NGO projects; mobile labs
Singapore	Basic	Multisensory observation; Question framing; Experiment planning; Safe apparatus use; Chart recording; Grouping; Explanation; Daily application; Communication	CPA stations; SLS workshops; hydroponics labs; smart-city demos; mobile guides
	Secondary	Urban food hypotheses; Vertical farm design; IoT sensor use; Energy analysis; Air quality interpretation; Water reuse; Building critique; Microclimate modeling; Dashboard reporting; SLS integration	Smart Nation labs; sensor networks; ecology excursions; digital twins; policy hackathons
Malaysia	Basic	Systematic observation; Hypothesis testing; Tool use; Experiment conduction; Record-keeping; Classification; Inference; Community projects; Reporting	bilingual kits; festival experiments; mobile labs; community fairs; digital integration
	Secondary	Soil hypotheses; Tropical assays; Botanical safety; Carbon analysis; Climate interpretation; Ecotourism uses; Peatland critique; Harvest modeling; Outreach communication; Stewardship	peatland workshops; ecotourism internships; herbal labs; cleanup campaigns; field seminars
S. Korea	Basic	Phenomenon observation; Precise questioning; Experiment design; Equipment use; Data logging; Classification; Conclusion drawing; Local issues; Communication	5E sequences; K-Pop infusion; AR labs; festival displays; clinic sessions
	Secondary	Semiconductor hypotheses; Clean-room experiments; Laser safety; Pollution analysis; Nanofab interpretation; Tech application; Factory critique; Resilience modeling; Forum communication; VR integration	CSAT labs; AR/VR tutorials; plant tours; maker collaborations; symposiums
UK	Basic	Curiosity-driven observation; Question crafting; Fair testing; Apparatus safety; Recording; Data comparison; Explanation; Everyday links; Illustration	Curiosity Approach; museum trips; park lessons; debates; cross-curricular links
	Secondary	Restoration hypotheses; Biodiversity tests; Titration	field badges; journals; brief

		safety; Erosion analysis; Energy data; Conservation uses; Policy critique; Flood modeling; Stakeholder communication; GIS	workshops; partnership labs; VR trips
Denmark	Basic	Phenomenon observation; Query framing; Experiment planning; Tool handling; Recording; Sorting; Interpretation; Community use; Visualization	Friluftsliv outdoors; maker workshops; sustainability modules; debate forums; art-Science projects
	Secondary	Wind farm hypotheses; Rig design; Turbine safety; Salinity analysis; Climate modeling; Sustainable design; Circular-economy critique; Coastal modeling; Policy briefs; Integration	sustainability labs; NGO ties; case studies; hackathons; symposiums
Germany	Basic	Phenomenon observation; Why/how questioning; Investigation design; Tool use; Recording; Categorization; Inference; Local links; Reporting	Sachunterricht kits; maker labs; ecology tours; seminars; career expos
	Secondary	Emission hypotheses; Engine tests; Spectroscopy safety; Wastewater analysis; Efficiency metrics; Engineering uses; Policy critique; Grid modeling; Reporting; Maker integration	mentorships; R&D visits; lab collaborations; fair sponsorships; maker fairs
Finland	Basic	Environment observation; Question formation; Investigation planning; Apparatus safety; Recording; Classification; Conclusion; Real-life use; Reporting	phenomenon modules; mobile labs; equity groups; eco-design; digital portfolios
	Secondary	Management hypotheses; Protocol design; Drone data; Permafrost analysis; Phenomenon interpretation; Tech application; Edtech critique; Climate modeling; Open access; Transdisciplinary	research projects; interdisciplinary labs; symposiums; digital journals; workshops
Tanzania	Basic	Phenomenon observation; Questioning; Hands-on activities; Tool use; Data recording; Classification; Interpretation; Community use; Communication	community labs; local workshops; agro camps; knowledge seminars; roadshows
	Secondary	Malaria hypotheses; Habitat studies; Kit safety; Epidemiology; Soil interpretation; Health application; Sanitation critique; Rangeland models; Leadership communication; Indigenous integration	prep labs; case studies; NGO labs; methodology workshops; outreach programs
South Africa	Basic	Phenomenon observation; Testable questions; Experiment planning; Equipment safety; Recording; Comparison; Evidence drawing; Local challenges; Reporting	Ubuntu circles; Science festivals; knowledge labs; ethics workshops; mobile units
	Secondary	HIV hypotheses; Purification trials; Biosafety; Pollution analysis; Soil metrics; Renewable access; Conservation critique; Heat-island modeling; Multilingual communication; Traditional integration	NSC practicals; knowledge exchanges; justice forums; health labs; showcases
Brazil	Basic	Phenomenon observation; Hypothesis formulation; Test design; Instrument use; Data logging; Grouping; Interpretation; Cultural context; Reporting	literacy integration; biodiversity labs; art events; engagement labs; fairs
	Secondary	Deforestation hypotheses; Canopy experiments; Equipment safety; Carbon analysis; Biodiversity indices; Agroforestry use; Mining critique; Flood modeling; Indigenous communication; Remote sensing	ENEM labs; ecosystem trips; agro demos; community projects; hackathons
USA	Basic	Phenomenon observation; Question refinement; Investigation planning; Tool safety; Data gathering; Organization; Conclusion; Real-world application;	NGSS 5E model; maker spaces; NASA ties; mentorships; Science fairs

		Multi-format reporting	
	Secondary	Sustainability hypotheses; Advanced labs; Fission demos; Satellite analysis; Survey interpretation; Tech entrepreneurship; Policy critique; Climate modeling; Journal communication; Maker integration	AP labs; FabLab workshops; symposiums; mentorships; publication clinics
Canada	Basic	Phenomenon observation; Question crafting; Fair testing; Tool use; Recording; Classification; Interpretation; Community use; Reporting	inquiry frameworks; Indigenous ties; bilingual exhibits; research fairs; storytelling labs
	Secondary	Arctic hypotheses; Monitoring design; Cold-chamber safety; Indigenous data; Forestry metrics; Stewardship; Rehab critique; Hydrology modeling; Bilingual communication; Participatory research	IB/AP labs; bilingual symposiums; citizen Science; policy briefs; mentorships
Australia	Basic	Phenomenon observation; Design questioning; Investigation planning; Tool safety; Data recording; Classification; Conclusion; Local application; Reporting	ACARA strand; outback trips; reef surveys; Indigenous integration; citizen Science
	Secondary	Bushfire hypotheses; Fire regime design; Instrument safety; Reef data analysis; Hydrology; Land management; Water critique; Cyclone modeling; Multicultural communication; App integration	SSRP projects; NAPLAN workshops; hackathons; industry labs; advocacy events

Appendix J: Contents in Science Subject across the Countries

Country	Level	Contents	Special Features
Nepal	Basic	Physical education activities, activities related to scientific thinking and the application of skills, Science, environment, local ecology, health, and physical education, Technology, etc. Content areas integrated into <i>mero serophero</i> are Our environment Our immediate world Scientific learning, Information and communication Technology, Organism/Creature and environment, Classification of organism, Life process, Matter, Energy in everyday life, and Earth and space Scientific learning, Information and Communication Technology, Organisms and structure, Biodiversity and environment, Life process, Force and movement, Energy in everyday life, Electricity and magnetism, Matter, Matters used in everyday life, Earth and space,	The lessons bring Science alive through local field trips and hands-on experiments. Students work in teams to explore community ecology. Classroom discussions link scientific concepts to everyday life. We integrate music and art to deepen understanding. Technology tools help students share and reflect on their findings.
	Secondary	Scientific study, Biology, Physics Information and Communication Technology, Chemistry,	Students conduct small-scale research projects relevant to local issues. We use case studies on mountain ecology and urban pollution. Lab work emphasizes safe, real-world applications. Digital presentations enable students to communicate results. Cross-disciplinary themes connect Science with history and culture.
India	Basic	Living organisms and habitats, Plant reproduction, Nutrition and digestion, States of matter, Magnetism and simple circuits, Light and shadows, Soil and water conservation, Air and weather, Pollution and waste management, Tools and machines, Human body systems, Energy forms, Materials and mixtures, Simple ecosystems, Scientific methods	Our classrooms buzz with hands-on activities that link Science to rural life. We hold “Science mela” events where students showcase experiments. Local examples, like monsoon patterns, anchor every lesson. Group investigations take learners into nearby fields and workshops. Multimedia and low-cost kits ensure no child misses out.
	Secondary	Physical world and measurement, Chemical reactions and equations, Cell biology, Human physiology, Force and laws of motion, Energy forms and transfers, Waves and sound, Electricity and circuits, Atomic structure, Periodic table trends, Biodiversity and classification, Ecology and environment, Genetics and bioTechnology, Scientific inquiry and reporting, Space Science and	Lab work follows rigorous CBSE practical guidelines with model-making sessions. Students design their own experiments under teacher mentorship. Field trips to water treatment plants bring chemistry to life. Poster-making and presentations build Science communication skills. We integrate digital simulations from national portals.

		astronomy	
Bhutan	Basic	Local flora and fauna, Plant classification, Human body hygiene, Materials and safety, Pushes and pulls, Energy in daily life, Water cycle, Soil erosion, Climate and seasons, Environmental stewardship, Traditional tools, Simple machines, Weather patterns, Local ecosystems, Scientific investigation skills	Science is paired with Gross National Happiness themes to nurture well-being. Outdoor forest walks help students study biodiversity firsthand. Simple herbal-extract demos link tradition with modern Science. Community clean-up drives reinforce environmental stewardship. Reflective “Science journal” entries cultivate thoughtful observation.
	Secondary	Fundamentals of biology (cells to systems), Plant physiology, Animal physiology, Chemical bonding and reactions, Acids, bases and salts, Motion and forces, Work and energy, Heat and temperature, Electricity and magnetism, Light and optics, Earth structure and tectonics, Atmospheric Science, Ecology and conservation, Laboratory techniques, Research project work	Students engage in hydropower site visits to learn energy conversion. Collaborative research on local conservation projects builds civic responsibility. Laboratory sessions use locally sourced materials to teach chemical principles. Presentations on forest regeneration link Science to culture. Peer review of research proposals develops critical thinking.
Bangladesh	Basic	Diversity of living things, Plant and animal classification, Nutrition and health, Properties of solids/liquids/gases, Simple forces, Light and sound sources, Water bodies and uses, Weather phenomena, Natural disasters awareness, Conservation practices, Tools and mechanisms, Material changes, Energy in everyday life, Ecosystems, Inquiry skills	Flood-management demonstrations on local canals teach applied hydrology. Students build simple weather stations to monitor monsoon patterns. “River day” excursions connect textbook ecology to the Sundarbans. Community-driven water-purification projects foster social learning. Local disaster-preparedness drills strengthen scientific resilience.
	Secondary	Cell biology and microbiology, Human anatomy and physiology, Chemical equations and stoichiometry, Organic chemistry basics, Laws of motion, Kinetic and potential energy, Thermal physics, Electric circuits, Wave phenomena, Optics and lenses, Earth resources and geology, Meteorology and climate, Environmental systems and pollution, Statistical data handling, Field study techniques	Wetland field kits allow hands-on salinity testing on river deltas. Cyclone shelter drills incorporate engineering Science. GIS mapping workshops teach spatial analysis. Students present findings to local councils for real-world impact. Lab sessions follow NCTB protocols with community involvement.
Sri Lanka	Basic	Plant and animal classification, Human senses and health, Mixtures and solutions, Motion and friction, Heat and temperature, Earth structure, Natural resources, Seasonal changes, Pollution control, Levers and pulleys, Materials and their properties, States of matter, Energy transformations, Weather and climate, Experimental skills	School gardens in tea estates let students study plant physiology firsthand. Local paddy field visits illustrate irrigation Science. “Healthy living” campaigns integrate biology with public health. Learners use simple lever-pulley kits from local craftsmen. Story-based lessons on ecological folklore connect Science and culture.
	Secondary	Advanced cell biology, Genetics and evolution, Chemical bonding and molecular structure, Stoichiometry and titrations, Mechanics and dynamics, Work, power and energy, Heat transfer, Electrical circuits and electronics, Sound and wave behavior, Light,	Students conduct hydroponics experiments in school labs. Coastal erosion field trips link geology to climate Science. Tea-processing demos integrate chemistry with local industry. Research projects on endemic species

		lenses and optical instruments, Earth and planetary Science, Ecology and human impact, Analytical chemistry, Research methodology, ICT applications	strengthen biodiversity awareness. Digital data-analysis workshops use local environmental datasets.
China	Basic	Characteristics of living things, Plant growth and reproduction, Human body care, States and changes of matter, Forces and balance, Energy sources, Rock and soil types, Weather and climate, Protecting the environment, Simple tools and mechanisms, Material properties, Ecosystems, Water cycle, Energy transformations, Scientific processes	Standardized “red book” experiments ensure consistent methodology. Nationally coordinated lab fairs feature student work. High-tech simulations teach industrial chemistry safely. “Green campus” initiatives promote environmental Science. Peer mentoring programs foster collaborative learning.
	Secondary	Cellular physiology, Molecular genetics, Chemical kinetics, Chemical equilibrium, Thermodynamics, Mechanics (statics and dynamics), Fluid mechanics, Electromagnetism, Wave optics, Quantum phenomena introduction, Earth structure and minerals, Environmental chemistry, Biodiversity and conservation, Laboratory instrumentation, Scientific writing	Gaokao-style lab drills prepare students for national exams. Industrial site visits connect theory with practice. Robotics modules integrate engineering with physics. Environmental monitoring stations on campus collect real-time data. Student Science journals develop technical writing skills.
Japan	Basic	Local ecosystems, Plant and animal needs, Body systems and hygiene, Materials and their uses, Gravity and motion, Light and reflection, Water cycle and weather, Natural resources conservation, Waste reduction, Mechanical advantage in tools, States of matter, Energy forms, Materials classification, Ecosystem interactions, Inquiry skills	Lesson-study cycles encourage teacher collaboration. Calligraphy-Science integration links art with observation. Robotics demos bring physics to life. Seasonal festivals provide contextual learning moments. Community clean-up days foster environmental responsibility.
	Secondary	Cell biology and histology, Genetic engineering principles, Organic chemistry fundamentals, Inorganic reaction mechanisms, Mechanics and materials Science, Thermodynamics and heat engines, Electrodynamics, Optics and photonics, Earth Science (geology, seismology), Atmospheric Science, Marine biology, Environmental Technology, NanoTechnology basics, Experimental design, Data analysis	Precision instrumentation labs model professional research. Earthquake simulation drills reinforce seismic Science. Tsunami modeling uses digital simulations. Nanotech workshops partner with local universities. Group research symposiums develop presentation skills.
Vietnam	Basic	Diversity of organisms, Nutrition and plants, Human health and hygiene, Properties of materials, Forces and movement, Energy transformations, Soil and water conservation, Seasonal weather patterns, Protecting environment, Simple machines, States of matter, Ecosystems, Scientific method, Local biodiversity, Observation skills	Delta-farm field trips connect agriculture with ecology. Bilingual instruction supports language learning. Village lab diaries document student observations. Community-Science festivals celebrate local biodiversity. Mobile labs bring Science to rural areas.
	Secondary	Cellular structure and function, Genetics and inheritance, Chemical reactions and quantitative analysis, Physical chemistry principles, Mechanics and kinematics, Energy and power, Heat and thermodynamics, Electricity and magnetism, Wave phenomena, Optics, Earth and space Science, Ecology and sustainable development, Analytical	Rice-field case studies integrate botany with community development. NGO partnerships enable real-world research. Water-management simulations use local data. Agroforestry internships teach sustainable practice. Digital mapping workshops build GIS skills.

		techniques, Research projects, ICT in Science	
Singapore	Basic	Classification of living things, Plant life processes, Animal life processes, Human body functions, Matter and its changes, Forces and interactions, Forms of energy, Earth's resources, Weather and climate, Simple machines, Materials properties, Ecosystems, Scientific inquiry, Data collection, Local environment study	CPA (Concrete–Pictorial–Abstract) approach scaffolds learning. SLS digital resources support self-directed study. Urban hydroponics labs teach sustainability. Smart-city sensor projects link STEM with policy. STEM clubs host national competitions.
	Secondary	Advanced cell biology, BioTechnology applications, Chemical synthesis and analysis, Reaction kinetics, Mechanics and material strength, Energy systems, Thermal physics, Electrical networks, Wave behavior and optics, Quantum Science introduction, Earth systems and geography, Marine ecology, Environmental management, Laboratory skills, Data processing	ICT integration through national Smart Nation platforms. Vertical-farm demos illustrate urban agriculture. Digital dashboards track environmental metrics. Industry mentorships bridge theory and practice. Research internships foster innovation.
Malaysia	Basic	Environment and ecosystems, Body parts and functions, Animal classification, Plant classification, Material properties, Changes of state, Forces and motion, Simple machines, Weather and climate, Natural resources, Energy in daily life, Health and hygiene, Scientific investigation, Data recording, Local biodiversity	Bilingual kits (Malay/English) ensure comprehension. UPSR-aligned practical packs standardize experiments. Mobile Science labs visit rural schools. Festival-themed projects tie Science to culture. Community-garden collaborations deepen local engagement.
	Secondary	Cell and tissue biology, Genetics and bioTechnology, Organic and inorganic chemistry basics, Stoichiometry, Laws of motion and dynamics, Work and energy, Heat and transfer, Circuits and electronics, Sound and wave phenomena, Light and optical systems, Earth Science and geology, Environmental Science, Analytical chemistry, Experimental techniques, Scientific communication	Ecotourism field trips link biology with economics. Peatland restoration workshops teach conservation. Herbal garden labs integrate traditional knowledge. Coastal cleanup campaigns promote civic Science. Interdisciplinary field seminars foster collaboration.
S. Korea	Basic	Air and its properties, Water cycle, Human body systems, Earth structure, Living vs non-living, Material properties, Simple machines, Forces and motion, Energy transformations, Weather and climate, Ecosystems, Health and hygiene, Scientific method, Observation and measurement, Data recording	5E instructional model structures lessons. K-Pop themed modules engage students. AR-lab experiences introduce virtual experiments. STEM festivals showcase student innovations. Peer-tutoring sessions reinforce concepts.
	Secondary	Cytology and histology, Molecular biology, Chemical equilibrium and thermodynamics, Kinematics and dynamics, Fluid mechanics, Electromagnetism, Optics and lasers, Quantum mechanics introduction, Geology and geomorphology, Meteorology, Ecology and population biology, Environmental pollution studies, Analytical instrumentation, Research methods, Science communication	CSAT-style lab assessments prepare for exams. AR/VR tutorials simulate complex phenomena. Industry plant tours connect theory with practice. Maker-space collaborations foster creativity. Academic symposiums develop presentation skills.
UK	Basic	Plants and plant life cycles, Animal groups, Materials and their uses, Seasonal changes,	“Curiosity Approach” uses themed enquiries. Museum and park excursions

		States of matter, Forces and magnets, Light and sound, Earth and space, Simple machines, Habitats and food chains, Health and hygiene, Scientific enquiry, Data collection, Weather and climate, Local environment study	bring Science outdoors. Debate-based inquiries develop critical thinking. Cross-curricular links integrate art and history. Citizen Science projects connect learners to research.
	Secondary	Cell biology and microscopy, Genetics and inheritance, Biological diversity, Chemical bonding and structure, Reaction kinetics, Thermochemistry, Mechanics and forces, Energy and power, Electricity and circuits, Wave properties, Light and optical phenomena, Earth Science (rocks, resources), Environmental Science, Practical skills, Reporting and evaluation	GCSE fieldwork badges recognize achievement. Field notebooks document student research. Policy-brief workshops simulate real-world Science advising. Conservation partnership labs build community links. Virtual reality field trips expand access.
Denmark	Basic	Nature and ecosystems, Materials and their properties, Plant life cycles, Animal life cycles, Forces and motion, Simple machines, Light and shadows, States of matter, Energy in everyday life, Weather and climate, Habitats, Health and safety, Scientific process, Data recording, Local environment exploration	Friluftsliv pedagogy takes lessons outdoors. Maker-house workshops foster creativity. Sustainability modules link to policy. Debate forums develop argumentation skills. Art-Science collaborations enrich learning.
	Secondary	Cell physiology, Molecular genetics, Organic and inorganic chemistry, Reaction mechanisms, Mechanics and statics, Dynamics and kinematics, Thermodynamics, Electrodynamics, Optics, Quantum phenomena, Earth and planetary Science, Ecology and conservation, Environmental Technology, Laboratory methodology, Scientific reporting	Policy hackathons teach real-world problem solving. NGO partnerships bring practice to class. Circular-economy case studies foster innovation. Interdisciplinary symposiums broaden perspectives. Renewable-energy demos illustrate sustainable design.
Germany	Basic	Local nature and habitats, Water cycle, Simple machines, Plant and animal classification, Health and hygiene, Material properties, States of matter, Forces and motion, Light and shadow, Energy sources, Ecosystems, Scientific methods, Data collection, Weather and climate, Environmental care	“Sachunterricht” maker kits empower student agency. Urban ecology tours connect learners to their city. Research seminar series develop inquiry skills. STEM career expos inspire futures. Science theatre shows engage the public.
	Secondary	Cells and tissues, Genetics and genomics, Biochemistry basics, Physical chemistry principles, Mechanics and material Science, Thermodynamics, Electromagnetism, Optics, Quantum theory introduction, GeoSciences, Meteorology, Environmental Science, Analytical chemistry, Experimental design, Science communication	Gymnasium Facharbeit mentorship supports independent research. University-school lab partnerships deepen expertise. Industry R&D visits link to innovation. Maker-space collaborations foster entrepreneurship. Science fair sponsorships celebrate achievement.
Finland	Basic	Seasons and seasonal changes, Living things and habitats, Human body health, Materials and mixtures, Forces and movement, Energy in everyday life, Simple machines, Plant life cycles, Animal life cycles, States of matter, Weather and climate, Ecosystems, Scientific enquiry, Data collection, Local environment study	Phenomenon-based modules foster holistic understanding. Mobile-lab buses bring Science to remote areas. Equity-focused groups ensure inclusion. Eco-design workshops spark creativity. Digital portfolios showcase student growth.
	Secondary	Cell and molecular biology, Bioinformatics introduction, Organic chemistry, Inorganic	National matriculation research projects develop independent study skills.

		chemistry, Reaction dynamics, Mechanics and material behavior, Fluid mechanics, Thermodynamics, Electromagnetic theory, Wave and quantum phenomena, Earth system Science, Ecology and sustainability, Laboratory techniques, Data analysis, Science communication	Interdisciplinary labs link chemistry and ecology. Research symposiums nurture scientific discourse. Peer-review workshops build critical analysis. Open-access publishing introduces academic standards.
Tanzania	Basic	Living things and habitats, Matter and its properties, Weather and climate, Plant life cycles, Animal life cycles, Human health and hygiene, Forces and motion, Energy use, Simple machines, Ecosystems, Scientific methods, Data recording, Local biodiversity, Health and safety, Environmental stewardship	Community-health labs merge Science with service. Local-materials workshops teach resourcefulness. Agro-Science camps connect agriculture and biology. Traditional-knowledge seminars honor culture. Mobile-Science roadshows reach remote schools.
	Secondary	Cell biology, Genetics and inheritance, Organic and inorganic chemistry, Reaction kinetics, Mechanics and dynamics, Thermal physics, Fluid mechanics, Electricity and magnetism, Wave phenomena, Optics, Earth Science and resources, Ecology and conservation, Environmental health, Analytical methods, Scientific presentation	CSEE practical prep builds exam confidence. NGO collaboration labs illustrate applied research. Research methodology workshops teach rigour. Community outreach programs demonstrate impact. Field case studies connect theory with local challenges.
South Africa	Basic	Matter and its properties, Life and living processes, Earth and beyond, Plant life cycles, Animal life cycles, Human body systems, Forces and motion, Energy transformations, Simple machines, Habitats and ecosystems, Health and hygiene, Scientific enquiry, Data collection, Weather and climate, Environmental awareness	Ubuntu learning circles foster collaborative inquiry. Community-Science festivals engage the public. Indigenous-knowledge labs bridge tradition and Science. Ethics-inquiry workshops cultivate responsible research. Mobile-Science units expand access.
	Secondary	Cell structure and function, Genetics, Molecular biology, Inorganic chemistry, Organic chemistry, Physical chemistry, Mechanics, Thermodynamics, Electromagnetism, Optics, Quantum introduction, Earth and space Science, Ecology and biodiversity, Environmental management, Research methodology	NSC practical assessments uphold standards. Indigenous knowledge exchanges enrich curriculum. Environmental justice forums engage social Science. Community health labs connect biology with service. Peer-research showcases celebrate student work.
Brazil	Basic	Air and its properties, Water cycle, Human health and hygiene, Animal classification, Plant classification, Soil and rocks, Matter and materials, Forces and motion, Energy forms, Simple machines, Ecosystems, Scientific process, Data collection, Local biodiversity, Environmental care	PNAIC literacy-Science integration supports reading skills. Amazon biodiversity labs connect ecology to identity. Carnival-Science art events merge culture and STEM. Community-engagement labs foster civic pride. Bio-diversity fairs showcase local species.
	Secondary	Cell biology, Genetics and bioTechnology, Biochemistry, Reaction kinetics, Thermodynamics, Fluid mechanics, Electromagnetism, Optics, Quantum Science introduction, Earth system Science, Ecology and conservation, Environmental chemistry, Analytical techniques, Experimental design, Science communication	ENEM prep labs align with national exams. Cerrado ecosystem excursions broaden ecological awareness. Agroforestry demonstrations teach sustainable land use. Indigenous community projects champion local knowledge. Sustainability hackathons spark innovation.
USA	Basic	Life Science (cells, organisms), Earth Science	NGSS 5E-model lessons structure

		(rocks, water cycle), Physical Science (forces, energy), Plant life cycles, Animal life cycles, Human body systems, Material properties, States of matter, Simple machines, Ecosystems, Scientific method, Data collection, Weather and climate, Habitats, Environmental stewardship	inquiry. Maker-spaces ignite creativity. NASA partnerships inspire space Science. STEM-mentorship programs support underrepresented students. Community Science fairs celebrate innovations.
	Secondary	Cell and molecular biology, Genetics and genomics, Organic chemistry, Inorganic chemistry, Physical chemistry, Mechanics, Thermodynamics, Electrodynamics, Optics and photonics, Wave phenomena, Quantum mechanics introduction, Earth system Science, Ecology and environmental Science, Laboratory techniques, Scientific communication	AP lab collaborations prepare for college. FabLab workshops develop design skills. Research symposiums cultivate academic discourse. Industry mentorships bridge classroom and workplace. Scientific publication clinics teach writing.
Canada	Basic	Nature and ecosystems, Energy in everyday life, Environmental awareness, Plant life cycles, Animal life cycles, Human body health, Material properties, States of matter, Forces and motion, Simple machines, Weather and climate, Scientific method, Data collection, Local environmental studies, Health and safety	Provincial inquiry frameworks champion student questions. Indigenous collaborations honor local knowledge. Bilingual exhibits foster inclusivity. Research fairs showcase young scientists. Digital storytelling labs connect tech and narrative.
	Secondary	Cell and tissue biology, Genetics and genomics, Biochemistry, Organic chemistry, Inorganic chemistry, Physical chemistry, Mechanics and material Science, Thermodynamics, Electromagnetism, Optics, Quantum phenomena, Earth Sciences, Ecology and conservation, Environmental chemistry, Scientific reporting	IB & AP lab modules deepen understanding. Bilingual Science symposiums engage diverse learners. Citizen Science platforms connect students to real research. Policy-brief workshops teach Science communication. Research mentorship programs guide advanced projects.
Australia	Basic	Living things and habitats, Forces and motion, Materials and their properties, Plant life cycles, Animal life cycles, Human body systems, States of matter, Energy transformations, Simple machines, Ecosystems, Weather and climate, Scientific investigation, Data recording, Local biodiversity, Health and hygiene	ACARA's Science as a Human Endeavour strand makes Science relevant. Outback expeditions bring fieldwork alive. Reef surveys teach marine biology. Indigenous knowledge integration enriches curriculum. Citizen Science programs build community partnerships.
	Secondary	Cell biology, Molecular biology, Genetics, Biochemistry, Organic chemistry, Physical chemistry, Mechanics and dynamics, Thermodynamics, Electromagnetism, Optics, Quantum Science introduction, Earth system Science, Ecology and biodiversity, Environmental management, Research methods	Senior Secondary Research Project fosters independent study. NAPLAN outcome workshops target literacy in Science. Policy hackathons develop real-world solutions. Industry-school partnership labs offer mentorship. Environmental advocacy events connect students to local and global issues.

Appendix K: Analysis of L1 language curricula across all countries

Country	Level	Competencies	Contents	Special Features
Nepal	Basic	Two-way communication during conversations, dialogues, discussions and question-answer sessions Understanding and expressing content based on pictures, events, surroundings and textual context Accurate pronunciation of sounds and letters used in words Encoding and decoding letters, numbers and words to produce pure speech and writing Fluent reading, appropriate understanding and expression Language work with understanding of audio, visual and audiovisual materials Use of creative and critical skills in oral and written expression	The development of listening, speaking, reading, writing skills, vocabulary, and basic communication skills.	The curriculum integrates local cultural values and communication skills. Language learning connects with real-life situations through daily activities and expressions. Students develop reading and writing through context-based and creative exercises. Visual, oral, and written materials help students internalize language meaningfully.
		Pronunciation with awareness of the letter structure of words Oral and written communication based on various topics Comprehension of the content and contextual expression by reading the text fluently Linguistic work by absorbing facts, values and ideas from various text materials Comprehension and logical expression of the content based on pictures, objects, events, surroundings and textual context Polite use of language	Language skill (Listening and speaking, Reading, Writing), content areas (social, natural, melodic, patriotic, and ethical poems; child psychological, legendary, historical, social, communication-related, and folk tales; essays related to agriculture,	Emphasis is placed on analyzing social, cultural, and interlingual expressions. Students engage in creative and critical writing using diverse text forms. Research and applied language tasks encourage deeper thinking and purposeful communication. The curriculum promotes respectful language use, debate, and linguistic self-expression.

		with awareness of social and cultural values Use of contextual language based on linguistic functions Use of standard language necessary for daily behavior Linguistic communication and problem solving using creative and critical skills	education, history, culture, health; letter writing to family members; dialogue on sports, culture, art, ; social story; travelogue; application writing for everyday life; biography; memoirs; daily dairy;),	
	Secondary	Oral and written expression of content seen, heard, read, learned and experienced Comprehension and expression of content transmitted orally, in writing and through media Identification of textual context and understanding and presentation of events, characters and environment Writing based on social, cultural and practical expressions Demonstration of linguistic behavior that is aware of interlingual and cultural values Development of linguistic ability to present research and projects Use of language according to purpose and context Identification of practical characteristics of Nepali language and use of standard forms Use of imaginative, speculative, logical, interactive, creative and critical skills in	Language skills: listening, speaking, reading, and writing Comprehension, expression, linguistic structure, language function Content areas: verse poem (Nature related,), poetic song (patriotic ,), story/tales (social, historical, legendary, folk, child psychology), prose poem (human value, social or labor), essay (agriculture, medical Science, education, self, culture, humor,)), applied writing (application, business letter,	Focus is on early literacy using folk content and rhymes. Learners build foundational grammar and phonetic skills. Oral communication and reading fluency are emphasized. Stories are used to make language learning engaging and familiar.

		performing linguistic tasks	official letter,), biography (national, international personality), dialogue (business, and ecology,), travelogue, speech, monologue, debate, <i>ekangi</i> (social)	
India	Basic	Listening with understanding; Reading aloud; Writing short answers	Alphabets, rhymes, folk tales, simple grammar	Students develop analytical and expressive skills through structured literature. Grammar and writing composition are taught systematically. Emphasis is placed on formal language and exam readiness. National texts and writing formats are key features.
	Secondary	Interpreting texts; Speaking formally; Writing long answers	Prose, poetry, grammar, composition	Language learning is rooted in local stories and phonics-based instruction. Activities are child-friendly and community-relevant. Oral and visual language is integrated for basic communication. Early writing tasks are guided and context-driven.
Bhutan	Basic	Listening to instructions; Recognizing letters; Reading clearly; Writing simple ideas	Letters, phonics, folk stories, short texts	Students explore cultural literature and apply ideas in written reports. Emphasis is on oral and written communication. The curriculum values local themes and moral education. Language tasks promote thinking, speaking, and presentation.
	Secondary	Understanding texts deeply; Presenting ideas; Writing in detail	Literature, essays, reports, vocabulary	Language instruction focuses on foundational communication skills. Folk rhymes and moral stories are widely used. Early grammar and vocabulary are introduced through storytelling. Functional speaking and writing are emphasized.
Bangladesh	Basic	Reading with fluency; Listening attentively; Speaking in full sentences; Writing basics	Letters, rhymes, stories, vocabulary	Writing and grammar are structured for exam preparation. Creativity is promoted through storytelling and poetry. Learners are guided in critical thinking and expression. Instruction balances cultural stories with formal writing.
	Secondary	Analyzing texts; Using grammar properly; Writing creatively	Essays, narratives, grammar, poetry	Instruction uses local songs and stories for engagement. Spoken language is emphasized early. Learners develop literacy through familiar topics. Reading and writing link with communication practice.
Sri Lanka	Basic	Speaking clearly;	Songs, short	The curriculum encourages critical

		Reading aloud; Writing short texts; Understanding messages	stories, alphabets, conversations	discussion and reasoning. Students explore modern and classical literature. Written expression is enriched with creative formats. Oral expression includes debates and group presentations.
	Secondary	Interpreting literary works; Debating issues; Writing essays	Prose, drama, grammar, creative writing	Language tasks are drill-based but include engaging idioms and stories. Emphasis is on respectful tone and structured writing. Literacy starts with character formation and usage. Speech training develops confidence.
China	Basic	Listening carefully; Reading with interest; Speaking politely; Writing sentences	Characters, stories, idioms, speech practice	Classical literature and composition are core elements. Writing is guided through formats and planning. Public presentation and speech are emphasized. Students practice clarity and formality.
	Secondary	Reading critically; Writing with structure; Presenting clearly	Classic texts, composition, modern literature	Early literacy is character-centered and story-based. Learners interact with traditional poems and stories. Writing starts with basic ideas. Group work and presentation build expression.
Japan	Basic	Recognizing characters; Reading short stories; Writing simple ideas	Kana, kanji, children's stories, poems	Focus is on formal language and thematic analysis. Writing covers a range of structured genres. Honorifics and respectful language use are taught. Literary reflection deepens expression.
	Secondary	Understanding themes; Writing detailed texts; Using respectful language	Classic Japanese, modern texts, grammar	Folk stories are used to build cultural identity. Reading is linked with oral discussion. Writing builds from practical situations. Language function is taught through example-based tasks.
Vietnam	Basic	Listening actively; Reading aloud; Writing short texts	Letters, words, local tales, rhymes	Students are guided through structured writing and grammar. Literary analysis supports deep understanding. Lessons prepare learners for public exams. Focus is on accuracy and clarity.
	Secondary	Writing structured essays; Interpreting messages; Analyzing grammar	Grammar, prose, essays, comprehension	Emphasis is on meaningful communication and expression. Local stories link language with culture. Digital tools enhance engagement. Grammar is taught in real-life contexts.
Singapore	Basic	Speaking confidently; Reading with understanding; Writing correct sentences	Picture books, grammar, local stories	Learners engage with various genres and write critically. Tasks focus on logic and structured argumentation. Vocabulary and grammar are refined. Digital learning supports independent study.
	Secondary	Writing arguments; Interpreting literature; Analyzing vocabulary	Poetry, fiction, non-fiction, grammar	Communication skills are built from daily experiences. Learning uses visuals and group work. Reading and writing are paired in lessons. Moral values are embedded in stories.
Malaysia	Basic	Listening to sounds;	Stories,	Students refine argument writing and

		Reading and speaking fluently; Writing daily events	grammar, rhymes, conversations	comprehension. Literature encourages empathy and analysis. Instruction focuses on exam standards. ICT use supports language learning.
	Secondary	Writing analytically; Reading with critique; Speaking formally	Essays, reports, drama, vocabulary	Language is taught through multi-modal activities. Reading and writing are blended. Literature introduces social values. Peer learning builds interaction.
S. Korea	Basic	Reading clearly; Speaking accurately; Writing ideas; Listening attentively	Stories, characters, poetry	Formal and media writing are introduced. Oral discussion is emphasized. Grammar is connected to reading comprehension. Tasks build academic and public speaking skills.
	Secondary	Writing reports; Understanding text structures; Discussing topics	Modern prose, grammar, speech, media texts	Literacy is developed through structured phonics and storytelling. Expression is encouraged from early stages. Assessment focuses on speaking and writing. Cultural content builds vocabulary.
UK	Basic	Reading fluently; Writing basic ideas; Speaking in full sentences	Stories, poems, phonics, conversation starters	Students explore literature with emphasis on audience awareness. Essays are structured and analytical. Grammar and tone are taught with purpose. Real-world texts like media are included.
	Secondary	Analyzing texts; Writing essays; Understanding tone and audience	Literature (Shakespeare etc.), grammar, media texts	Language is introduced through storytelling and oral work. Students explore classic texts with interaction. Expression and listening are emphasized. Grammar supports sentence building.
Denmark	Basic	Listening to stories; Speaking clearly; Writing simple sentences	Fairy tales, dialogues, basic grammar	Students write reflectively on diverse texts. Group discussions deepen understanding. Journalism and literature are compared. Language is explored through real-life themes.
	Secondary	Writing reflections; Analyzing literary texts; Participating in discussion	Modern and classical literature, essays, news texts	Local literature builds comprehension. Speaking and writing develop together. Fables teach moral and narrative skills. Reading aloud strengthens fluency.
Germany	Basic	Reading aloud; Expressing thoughts; Writing words and short texts	Fables, poems, daily life stories	Focus is on writing refinement and interpretation. Textual meaning and structure are analyzed. Grammar and formality are prioritized. Essays and discussions are structured.
	Secondary	Writing reviews; Interpreting author's intent; Using precise language	Literary analysis, grammar, formal writing	Thematic learning integrates reading, writing, and speech. Students work on real-world communication. Collaboration is encouraged. Literacy is taught through creativity.
Finland	Basic	Listening and responding; Reading stories; Writing ideas	Picture books, vocabulary, grammar	Learners express views through structured essays. Literary and real-world texts are compared. Writing

		clearly		types include argument, narrative, and discussion. Student voice is emphasized.
	Secondary	Expressing opinions in writing; Analyzing texts; Producing different text types	National literature, debates, argumentative texts	Instruction is local and culturally relevant. Oral activities promote participation. Writing builds gradually from reading. Local language elements are included.
Tanzania	Basic	Listening to teachers; Reading letters and words; Writing simple phrases	Rhymes, local stories, alphabet	Students build on basic skills with formal writing. Speaking is used for idea sharing. Literature is linked with grammar learning. Exam writing is guided and structured.
	Secondary	Writing paragraphs; Understanding readings; Expressing views in speech	Composition, poetry, grammar	Language is linked with everyday experience. Group tasks support literacy. Tales and vocabulary teach culture. Early writing is personal and practical.
South Africa	Basic	Listening and speaking clearly; Reading short passages; Writing about daily life	Everyday vocabulary, stories, local tales	Analytical and visual literacy are emphasized. Vocabulary is deepened through exposure. Essays encourage structured thinking. Reports link with social issues.
	Secondary	Writing analytically; Evaluating texts; Using advanced vocabulary	Literary essays, reports, visual texts	Oral expression is encouraged early. Culture is shared through folklore. Letters and poems build fluency. Speaking and writing are practiced daily.
Brazil	Basic	Recognizing sounds; Speaking in full sentences; Writing letters and words	Folklore, alphabet, nature poems	Focus is on theme-based analysis and structure. Writing is done through guided formats. Language is formal and expressive. National texts support cultural identity.
	Secondary	Producing structured texts; Interpreting themes; Using appropriate tone	Literary movements, modern texts, essays	Reading and writing develop from phonics. Texts relate to students' lives. Stories build narrative skills. Writing is personalized and expressive.
USA	Basic	Listening with purpose; Reading independently; Writing basic stories	Phonics, stories, sentence structure	Essays follow structured reasoning. Argument and persuasion are practiced. Literary themes are explored in depth. Discussions build oral fluency.
	Secondary	Analyzing literary devices; Writing critical essays; Speaking in discussions	American literature, argument writing, speech	Multicultural themes support literacy. Stories and songs enhance vocabulary. Early writing reflects local culture. Listening is paired with speaking.
Canada	Basic	Reading with fluency; Writing with clarity; Listening actively	Folk stories, songs, grammar	Writing takes many forms: essays, stories, presentations. Students analyze and create texts. Multimedia is part of language instruction. Personal voice is valued.
	Secondary	Engaging with diverse texts; Writing in multiple forms;	Canadian literature, multimedia,	Literacy links with real-life tasks. Students build fluency through repetition. Rhymes and texts reflect

		Presenting ideas	creative writing	daily life. Visual tools enhance learning.
Australia	Basic	Recognizing letters; Speaking in full sentences; Writing short messages	Alphabet knowledge, rhymes, everyday texts	Writing types are tailored to audience and purpose. Meaning is emphasized in reading. Cohesion and logic are taught. Oral and written skills are equally valued.
	Secondary	Creating text types; Interpreting meaning; Writing with cohesion	Narrative, persuasive, informative texts	The curriculum integrates local cultural values and communication skills. Language learning connects with real-life situations through daily activities and expressions. Students develop reading and writing through context-based and creative exercises. Visual, oral, and written materials help students internalize language meaningfully.

Appendix L: Competencies in language (L₂) across the countries

Country	Level	Competencies (10)	Special Feature
Nepal	Basic	Identification and use of the characteristics of energy sources, air, water, etc. in daily life Awareness of surrounding objects, events and weather Awareness of environmental cleanliness, disease and health Creative presentation through music and visual arts and respect Identification, classification, conservation of plants and animals and understanding of their interrelationships with their environment Development of scientific learning and Science procedural skills and practical skills Modeling objects using paper and clay and printing from local materials Identification and use of the characteristics of energy sources, air, water, etc. in daily life Awareness of surrounding objects, events and weather Awareness of environmental cleanliness, disease and health Creative presentation through music and visual arts and respect Identification, classification, conservation of plants and animals and understanding of their interrelationships with their environment Development of scientific learning and Science procedural skills and practical skills Modeling objects using paper and clay and printing from local materials Understanding of the scientific learning process and application of scientific procedural skills Exchange of information and ideas, analysis and appropriate use of information Technology Demonstrate understanding of the interrelationship between biodiversity and the environment and efforts to conserve it Knowledge and understanding of the importance of organisms and life processes Identification and application of basic aspects related to the use of force and tools in daily life Basic knowledge of the characteristics of various forms of force used in daily life, readiness for their proper use and conservation Knowledge of the properties of matter and its use in daily life Identification and appropriate use of matter used in daily life Demonstrate basic information and understanding of the Earth and space	Use multimedia in classrooms Apply peer-assisted learning Incorporate visual arts Encourage hands-on modeling
	Secondary	Development of skills, strategies and habits necessary for scientific research Demonstrate understanding of the usefulness and	Integrate ICT in language labs Organize cross-grade

		limitations of Science and Technology Demonstrate understanding of the interrelationships between environmental components and contribute to environmental protection Concept and application of classification of organisms, life processes and sequence of development Analysis of concepts related to physical activities and processes and their application in practical life Acquire basic information about the origin, present and future of the universe Use of information and communication Technology in the information and learning process Observation, analysis of the properties of matter and demonstrate understanding of their scientific purposes Identification and appropriate use of chemicals useful in practical life Exploration and application of scientific concepts in traditional practices	debates Promote environmental awareness Link Science with traditional practices
India	Basic	Language skills: speaking, reading, writing, Language function (introducing others and asking for information, asking for, giving and denying permission, requesting and responding, expressing good wishes and talking about personal experiences, making suggestions and persuading, Expressing intention with reasons/needs, expressing opinions, feelings, and predictions, talking about habits, expressing obligations and prohibitions, etc.), Grammar (tense, countable and uncountable nouns, yes/no questions, modal verbs, connectives, common noun, wh questions, subject verb agreement, question tag, reported speech statement)	Teach through local proverbs Contextualize with folk stories Link grammar to conversation Emphasize functional communication
	Secondary	Identify main ideas in articles, Summarize short texts, Use English in everyday communication, Write coherent paragraphs, Participate in group discussions, Prepare oral presentations, Interpret simple literary passages, Use correct tense forms, Employ varied vocabulary, Draft basic reports	Focus on spoken drills Promote oral presentations Use CBSE learning goals Enhance fluency through discussion
Bhutan	Basic	Listen to and follow simple instructions, Name classroom objects, Label pictures, Repeat short phrases, Ask basic “what” questions, Use “I am/You are” structures, Read single words, Write simple labels, Respond to yes/no questions, Greet and introduce self	Combine Dzongkha and English Promote bilingual understanding Use culturally relevant content Focus on labeling and naming
	Secondary	Express personal ideas in short speeches, Read and interpret paragraphs, Write structured short essays, Use linkers in writing, Participate in	Integrate GNH principles Use community-based topics

		debates on community topics, Comprehend news reports, Summarize factual texts, Use modals for advice, Draft project proposals, Give peer feedback	Draft real-life proposals Encourage student expression
Bangladesh	Basic	Name common classroom items, Ask/answer simple yes/no questions, Read short sentences, Write single-line answers, Use “this is/that is” structures, Understand basic classroom English, Repeat familiar dialogues, Spell high-frequency words, Listen/respond to simple stories, Use greetings	Use bilingual transliteration Teach with visual aids Focus on repetitive dialogues Support English sound recognition
	Secondary	Write coherent paragraphs, Describe processes in writing, Interpret short essays, Use passive voice in reporting, Conduct simple interviews, Deliver oral summaries, Analyze short stories, Use reference materials, Compose formal emails, Engage in peer review sessions	Prepare for BCS exams Use reference materials Practice formal writing Encourage peer interaction
Sri Lanka	Basic	Understand simple classroom English, Speak one-sentence answers, Read simple dialogues, Write brief responses, Use polite requests (“please,” “thank you”), Recognize basic grammar patterns, Follow teacher-led chants, Match words with pictures, Participate in role plays, Repeat nursery rhymes	Use Sinhala/Tamil examples Reinforce grammar through chants Encourage polite expressions Match visuals with texts
	Secondary	Explain ideas orally with clarity, Comprehend mid-level readings, Write structured responses, Use cohesive devices in essays, Deliver presentations on cultural topics, Analyze character sketches, Engage in group storytelling, Use conditional sentences appropriately, Write summaries, Participate in debates	Align with O/L formats Incorporate debates and essays Deliver cultural presentations Use cohesive writing tools
China	Basic	Respond to teacher prompts, Name daily objects in English, Read and write basic vocabulary, Use “I like” statements, Follow simple classroom routines, Repeat chants, Label images, Match words/sounds, Ask “What is this?” questions, Perform simple dialogues	Blend Pinyin with English Use matching tasks Promote oral dialogues Follow fixed routines
	Secondary	Understand short English dialogues, Write brief opinion pieces, Use reported speech, Read graded readers, Summarize audio clips, Present on cultural topics, Use collocations correctly, Compose descriptive paragraphs, Participate in pair interviews, Analyze advertisement texts	Align with Gaokao English Include cultural presentations Use collocations properly Encourage critical summaries
Japan	Basic	Listen to simple greetings, Respond to “How are you?” questions, Read katakana loanwords, Write short hiragana/katakana words, Use basic classroom phrases, Repeat songs, Follow simple instructions, Ask “What’s this?” in English, Match English words to pictures, Perform short skits	Apply phonetic support (furigana) Teach through skits and songs Use kana-English linkages Follow simple routines
	Secondary	Write descriptive essays, Understand longer conversations, Use English for self-introduction, Analyze short news clips, Compose email messages, Participate in group discussions, Interpret lyric translations, Use advanced	Prepare for EIKEN exams Encourage self-introduction Use grammar in writing Analyze real media content

		grammar points, Critique peer writing, Deliver oral summaries	
Vietnam	Basic	Use English greetings, Read/write personal information, Listen to short stories, Repeat key phrases, Identify simple vocabulary in context, Ask basic “where” and “when” questions, Label objects, Use “this is/these are” sentences, Read short signs, Write simple sentences	Contextualize in Vietnamese Label everyday objects Repeat key expressions Use bilingual examples
	Secondary	Write structured paragraphs, Understand audio scripts, Make short presentations, Use linking words effectively, Read authentic texts, Summarize news reports, Compose emails, Participate in role plays, Analyze simple poems, Use correct verb tenses	Prepare for TOEIC Bridge Compose emails and summaries Emphasize verb accuracy Promote role play
Singapore	Basic	Speak in complete sentences, Understand short dialogues, Listen for specific information, Read simple passages, Write basic sentences, Use everyday expressions, Repeat classroom chants, Ask/answer “yes/no” questions, Label pictures, Spell key vocabulary	Apply CPA method Use bilingual tools Emphasize everyday phrases Teach with visual chants
	Secondary	Analyze passages critically, Write formal/informal texts, Speak fluently in discussions, Interpret data charts in English, Deliver TED-style talks, Use idiomatic expressions, Summarize podcasts, Draft reports, Engage in peer editing, Conduct oral interviews	Link to GCE English curriculum Encourage TED-style speaking Use idioms and podcasts Conduct oral assessments
Malaysia	Basic	Answer simple questions, Read common words, Use basic greetings, Write short sentences, Listen/respond to dialogues, Repeat chants, Match words to meanings, Use simple present tense, Label classroom items, Participate in mini-dialogues	Combine Malay/English support Match words with visuals Use simple structures Repeat classroom dialogues
	Secondary	Write informational texts, Listen to structured dialogues, Express opinions in writing, Read mid-level passages, Present project findings, Use formal registers, Compose emails, Analyze advertisements, Use passive structures, Conduct peer assessments	Target PT3/MCE exams Apply formal writing Analyze media texts Encourage peer feedback
S. Korea	Basic	Understand classroom commands, Speak in short phrases, Read simple sentences, Write basic words, Listen/respond to everyday questions, Repeat dialogues, Match words/pictures, Use “I want” statements, Ask “How much?” questions, Use simple adjectives	Integrate K-POP themes Apply 5E learning model Teach classroom interaction Focus on speaking desires and costs
	Secondary	Read magazine articles, Write opinion pieces, Listen to English media clips, Use advanced connectors, Summarize research articles, Present debates, Draft formal letters, Critique literature, Translate short texts, Conduct peer teaching	Align with IELTS/TOEFL Use academic content Encourage peer teaching Summarize academic media
UK	Basic	Follow simple instructions, Speak in short sentences, Read beginner texts, Write basic words, Use “please/thank you,” Ask basic wh-questions, Label objects, Repeat nursery rhymes, Spell simple words, Engage in role plays	Follow thematic literacy plans Use polite expressions Integrate nursery rhymes Apply role-play strategy
	Secondary	Write structured essays, Understand varied	Align with GCSE outcomes

		English texts, Speak fluently in debates, Read critically, Compose reports, Use subjunctive mood, Analyze poetry, Draft formal letters, Lead seminar discussions, Peer assess essays	Conduct peer essay reviews Compose reports and letters Lead seminar presentations
Denmark	Basic	Understand basic English commands, Use simple verbs, Read aloud, Write single words, Listen/respond to stories, Repeat key phrases, Ask basic questions, Label images, Participate in songs, Match words to translations	Use Danish-English comparisons Promote reading and labeling Match translations with visuals Encourage singing participation
	Secondary	Comprehend intermediate readings, Write clear paragraphs, Communicate ideas orally, Analyze texts, Use modal verbs correctly, Summarize articles, Conduct group presentations, Draft reports, Peer review drafts, Interpret media clips	Focus on final exams Promote group projects Interpret real-world texts Conduct peer feedback
Germany	Basic	Respond to basic questions, Speak clearly, Read new words, Write simple sentences, Listen/respond to instructions, Repeat phrases, Label vocabulary, Ask “What’s your name?”, Use polite forms, Match words and meanings	Use English-German glossaries Promote speaking and politeness Focus on questions and answers Teach vocabulary labeling
	Secondary	Read informative texts, Express views in writing, Understand spoken English, Write argumentative essays, Deliver presentations, Analyze news reports, Use complex syntax, Translate short passages, Conduct oral exams, Lead group discussions	Prepare for Abitur exams Use complex syntax Encourage group discussions Practice news and text analysis
Finland	Basic	Recognize sounds, Answer simple questions, Use greetings, Read simple signs, Write key words, Listen/respond to short texts, Repeat poems, Label environments, Match Finnish/English words, Participate in songs	Use bilingual phenomenon-based lessons Promote sound-word matching Encourage poetic repetition Label learning environments
	Secondary	Write emails, Read fluently, Present topics in English, Analyze literature, Use academic registers, Summarize research, Conduct interviews, Draft project proposals, Critique peer work, Use citation conventions	Emphasize matriculation writing Teach citation and critique Present academic topics Conduct research summaries
Tanzania	Basic	Speak English words, Read letters/words, Respond in English, Write short phrases, Listen/respond to stories, Repeat chants, Label pictures, Ask basic questions, Use classroom phrases, Match words to pictures	Integrate Kiswahili-English switching Use classroom English Match pictures and phrases Practice repeated chants
	Secondary	Understand English texts, Write short answers, Speak in public, Use complex sentences, Read journal articles, Draft reports, Lead discussions, Analyze media, Conduct interviews, Peer assess presentations	Prepare for Cambridge O-levels Analyze media texts Draft reports and interviews Engage in group discussions
South Africa	Basic	Listen and repeat, Speak clearly, Read basic words, Write simple sentences, Use classroom	Apply Ubuntu collaboration Encourage repeat chants

		English, Repeat chants, Label pictures, Ask/answer simple questions, Match words and images, Participate in songs	Use visual learning Label classroom content
	Secondary	Use English in debates, Write coherent essays, Read for analysis, Summarize articles, Present research, Conduct peer reviews, Analyze film scripts, Draft reports, Lead seminar discussions, Critique literature	Align with CAPS Grade 12 Conduct peer-reviewed essays Present research orally Critique scripts and articles
Brazil	Basic	Name objects in English, Use daily expressions, Read aloud, Write basic phrases, Listen/respond to instructions, Repeat songs, Label images, Match words to Portuguese, Ask “How are you?”, Use “I have” statements	Teach with Portuguese-English phonics Repeat songs and chants Match images and names Use common expressions
	Secondary	Write reports, Interpret readings, Communicate ideas clearly, Use advanced grammar, Read literary texts, Present workshops, Draft project proposals, Analyze advertisements, Conduct interviews, Lead group discussions	Focus on ENEM readiness Draft reports and proposals Conduct interviews Lead group discussions
USA	Basic	Understand simple English, Write about self, Read signs and labels, Listen/respond to greetings, Repeat nursery rhymes, Label classroom objects, Ask basic questions, Match pictures/words, Use “I like/I don’t like,” Write short sentences	Follow CCSS foundations Use self-referential tasks Label classroom visuals Repeat simple patterns
	Secondary	Understand idioms, Write formal texts, Listen to English content, Analyze literature, Compose research papers, Lead discussions, Present findings, Use citation styles, Peer review essays, Critique media clips	Integrate AP English standards Critique academic texts Write research papers Use idioms and peer editing
Canada	Basic	Listen with understanding, Read clearly, Write short responses, Speak simple sentences, Match words/pictures, Ask basic questions, Repeat chants, Label items, Use “please/thank you,” Participate in songs	Include Indigenous languages Promote picture-word pairing Encourage chanting and politeness Practice basic conversations
	Secondary	Engage in conversation, Read critically, Write in context, Use academic vocabulary, Present seminars, Analyze texts, Conduct debates, Draft proposals, Peer review writing, Critique research papers	Emphasize provincial assessments Analyze academic texts Use academic vocabulary Conduct debates and reviews
Australia	Basic	Speak with prompting, Read basic English, Listen to instructions, Write simple words, Repeat classroom chants, Label images, Ask basic questions, Match words to pictures, Participate in songs, Use greetings appropriately	Integrate Science contexts Follow ACARA framework Use greetings in songs Encourage labeling and matching
	Secondary	Write to inform, Understand spoken English, Read nonfiction, Draft reports, Lead discussions, Analyze texts, Conduct interviews, Peer review work, Present research, Critique media	Focus on NAPLAN literacy Critique nonfiction and media Conduct peer assessments Present academic findings

Appendix M: Contents in language (L₂) across the countries

Country	Level	Contents	Special Feature
Nepal	Basic	Skills: Listening, speaking, reading, writing; Themes/Language Function: Alphabet; Me and my family (greetings; introducing; talking about home and family); My daily life (days of the week; expressing ability; telling the time); My school (present actions; commands; permission); Our environment (location; yes/no & wh-questions); My belongings (possessions); Our culture (age; numbers); Communication Technology and Market (jobs); Fruits and vegetables (information giving); Hobbies and interests (likes/dislikes); Birds and animals (describing)	The lessons start with a local-ecology field walk that brings vocabulary to life. Students then work in small groups to record observations with tablets or sketchpads. We integrate music and art to deepen understanding of themes. Every week, learners teach back a mini-lesson to peers. Finally, community projects let students apply language skills in real contexts.
	Secondary	Listening; speaking; reading; writing; making plans and expressing intentions; suggesting, advising and warning; making requests and responses; expressing condolences and sympathy; apologizing; asking for permission; accepting/rejecting offers; describing people, places, objects; giving instructions and directions; narrating past events; expressing certainty; congratulating; conditions; themes: travel, health, family, culture, environment, Technology; grammar: relative clauses, prepositions, articles	We begin with multimedia case studies on travel and health to spark discussion. Students then draft e-posters using ICT tools to present their ideas. Classroom debates help them practice giving and rejecting offers. Weekly peer-review sessions build confidence in writing. Field visits to local markets and hospitals connect language to everyday life.
India	Basic	Everyday expressions; Basic vocabulary; Short stories; Simple dialogues; Classroom commands; Greetings and leave-taking; Numbers and counting; Colors and shapes; Family and home; Days of the week	Folk tales and local proverbs to frame each lesson, make abstract concepts concrete. Small-group skits let learners practice dialogues in a safe space. Low-cost, recycled materials support hands-on projects. Periodic “Science mela” showcases reinforce learning through play. Mobile-lab outreach brings lessons to neighboring communities.
	Secondary	Grammar rules (tenses, articles, modals); Informal letters; Formal letters; Essay writing; Literature extracts; Comprehension passages; Poetry appreciation; Dialogue writing; Summary writing; Report writing	Structured lab-style writing workshops guide students through each genre step-by-step. We integrate model-making sessions to visualize grammar structures. Guest speakers from local industries demonstrate real-world applications. Collaborative peer-editing circles sharpen both writing and critical-reading skills. Digital portals provide

			further practice and feedback.
Bhutan	Basic	Daily use words; Classroom objects; Simple chants; Greetings and introductions; Numbers up to 20; Colors and shapes; Family terms; Days and months; Simple verbs; Yes/No questions	Lessons begin with mindfulness chants to connect language with well-being. Outdoor nature walks reinforce vocabulary around flora and fauna. Students then design simple posters using natural materials. Weekly “happiness journal” entries link language practice with emotional literacy. Traditional knowledge guests share local stories to deepen cultural understanding.
	Secondary	Composition writing; Reading comprehension passages; Grammar exercises; Cloze tests; Vocabulary building; Dialogue writing; Letter writing; Story summarization; Critical reading; Translation practice	We anchor each unit in a real conservation or hydropower case study. Students conduct interviews with local experts and write formal reports. Peer-review workshops develop critical reading skills. Collaborative translation projects preserve traditional texts. Digital storytelling tools let learners share their work with the wider GNH community.
Bangladesh	Basic	English letters; Numbers and counting; Greetings and farewells; Classroom vocabulary; Simple questions; Yes/No responses; Colors and shapes; Family members; School objects; Days of the week	Flood-preparedness simulations use simple props to teach key terms. Students build mini-weather stations to track rain patterns. Community-led water-filtration demos link Science with language. Story circles around the Sundarbans foster a love of reading. Local craftspeople teach terminology through traditional boat-building terms.
	Secondary	Grammar drills (tenses, modals, passive voice); Essay writing; Unseen passage comprehension; Letter writing; Report writing; Dialogue scripting; Summaries; Story writing; Vocabulary expansion; Email writing	Coastal field labs allow hands-on salinity and ecology lessons. GIS mapping sessions introduce technical vocabulary. Students draft NGO-style reports on flood mitigation. Peer debates on climate policy build persuasive language skills. Digital portfolios showcase each student’s research and writing over the term.
Sri Lanka	Basic	English stories (short); Classroom commands; Colors vocabulary; Number words; Greetings and introductions; Weather terms; Family vocabulary; School routine terms; Simple questions; Yes/No answers	School gardens in tea plantations provide living vocabulary walls. Students document growth cycles through journals. Interactive paddy-field visits teach ecosystem terms. Storytelling by village elders connects language to culture. Weekly weather-report broadcasts hone oral fluency and listening skills.
	Secondary	Reading passages; Grammar practice; Composition writing; Comprehension questions; Dialogue writing; Report writing; Summary writing; Poetry interpretation; Formal letter writing; Debates	Hydroponics lab projects link chemistry with agriculture vocabulary. Coastal erosion trips illustrate earth-Science terminology. Tea-processing site visits deepen technical language. Poetry slams develop creative expression. Structured debate tournaments build critical-thinking and formal register skills.
China	Basic	Alphabet (A–Z); Classroom items; Greetings and farewells; Family terms; Numbers 1–20; Colors; Days and months; Simple verbs; Yes/No questions;	Pinyin-English pairing in every lesson supports accurate pronunciation. Students record themselves for iterative feedback. Multimedia story apps reinforce vocabulary visually and aurally. “Green campus”

		Classroom commands	initiatives teach environmental terms in context. Peer-led pronunciation circles foster confidence.
	Secondary	Grammar exercises; Reading passages; Communication tasks; Letter writing; Essay writing; Cloze passages; Dialogue practice; Report writing; Summary writing; Translation exercises	Gaokao-style timed drills build exam stamina. Industry site visits link commerce vocabulary with real-world business. Robotics demos introduce STEM language in English. Environmental monitoring projects teach technical reporting. University partner lectures expose learners to academic discourse.
Japan	Basic	Greetings and farewells; Colors; Basic nouns (animals, objects); Basic verbs (eat, go, see); Family terms; Numbers 1–10; Days of week; Classroom phrases; Simple adjectives; Yes/No questions	Furigana-style phonetic guides run alongside all materials. Seasonal matsuri-themed lessons tie language to culture. Robotics club sessions use English STEM terms. Calligraphy practice builds kanji–English connections. Group reflection circles foster collaborative pronunciation practice.
	Secondary	Dialogue reading; Grammar practice; Writing skills (essays, letters); Comprehension passages; Vocabulary quizzes; Cloze tests; Summary writing; Role-play dialogues; Report writing; Translation practice	EIKEN-style mock tests track progress toward certification. Tsunami-simulation labs contextualize disaster vocab. Nanotech workshops feature specialized English jargon. Precision lab stations teach academic register. Peer small-group tutorials reinforce challenging concepts.
Vietnam	Basic	Simple vocabulary (common objects); Basic verbs; Question words (who, what, where); Greetings; Numbers; Family terms; Colors; Days and months; Classroom commands; Yes/No questions	Village farming excursions teach agricultural vocabulary first-hand. Bilingual word charts in every room aid comprehension. Mobile lab buses bring English Science to remote districts. Community poster-making events develop collaborative skills. Festival-themed language games add local flair.
	Secondary	Grammar drills; Writing paragraphs; Conversational practice; Reading comprehension; Vocabulary building; Email writing; Dialogue practice; Summary writing; Report writing; Translation exercises	TOEIC-style listening labs use international audio. Rice-paddy ecology fieldwork anchors Science vocabulary. NGO collaborations let students draft real outreach materials. Digital mapping workshops introduce GIS terms. Peer-review circles sharpen writing coherence.
Singapore	Basic	Core vocabulary (everyday items); Phonics practice; Simple stories; Greetings; Classroom instructions; Family and home; Colors and shapes; Numbers; Days of week; Short dialogues	CPA (Concrete–Pictorial–Abstract) stations guide progressive mastery. SLS digital platforms enable flipped lessons. Urban farm visits teach sustainability terms. Smart-class sensor demos visualize data in real time. School-run Science festivals promote STEAM engagement.
	Secondary	Grammar review; Comprehension exercises; Essay writing (formal/informal); Oral presentations; Vocabulary expansion; Cloze passages; Critical reading; Dialogue scripting; Report writing; Summary writing	GCE-aligned capsule courses streamline exam prep. Vertical-farm research modules apply real-world Science. Digital dashboards track learning analytics. STEM-mentorship pairings foster peer learning. National robotics competitions extend classroom learning.
Malaysia	Basic	Numbers and counting; Time	Bilingual Malay/English resources ensure

		expressions; Family terms; Classroom commands; Greetings; Colors; Days and months; Simple verbs; Yes/No questions; Simple adjectives	concept clarity. UPSR-aligned practical kits standardize experiments. Community garden partnerships bring ecology to life. Cultural festival tie-ins enrich engagement. Mobile lab outreach bridges urban–rural divides.
	Secondary	Report writing; Dialogue practice; Descriptive texts; Grammar exercises; Comprehension passages; Email writing; Summary writing; Story writing; Vocabulary tests; Presentation skills	PT3/MCE focused workshops fine-tune exam strategies. Coastal mangrove visits teach environmental terms. Herbal garden labs explore botany vocabulary. Interfaith stewardship projects build cultural empathy. Digital storytelling builds multimedia literacy.
S. Korea	Basic	Greetings; Hobbies vocabulary; Family words; Classroom instructions; Numbers; Colors; Days and months; Yes/No questions; Simple verbs; Simple adjectives	5E model sequences structure every lesson. K-Pop themed lyric analyses boost motivation. AR-lab sessions simulate invisible phenomena. STEM festivals showcase student projects. Peer-teaching clinics reinforce pronunciation.
	Secondary	Writing practice (essays, reports); Speaking drills; Reading articles; Vocabulary building; Grammar review; Cloze tests; Dialogue practice; Summary writing; Presentation skills; Translation exercises	CSAT-style timed drills build exam resilience. AR/VR tutorials visualize complex topics. Industry site visits contextualize technical vocabulary. Maker-space projects foster hands-on learning. Academic symposiums develop research skills.
UK	Basic	Everyday English phrases; Classroom phrases; Simple grammar points; Greetings; Numbers; Colors; Family terms; School vocabulary; Days of week; Yes/No questions	Thematic “Curiosity Approach” sparks enquiry. Museum and park excursions connect Science to society. Role-play debates build critical thinking. Cross-curricular art projects deepen understanding. Citizen Science drives community engagement.
	Secondary	Comprehension passages; Writing tasks (essays, letters); Media literacy activities; Grammar drills; Vocabulary expansion; Report writing; Debates; Presentation skills; Summary exercises; Critical reading	GCSE-aligned fieldwork excursions strengthen place-based learning. Policy-brief workshops simulate real advisory roles. Conservation partnership labs with NGOs foster practical skills. Virtual-reality field trips extend access. Debate leagues build rhetorical skill.
Denmark	Basic	Days of week; Colors; Classroom vocabulary; Numbers; Greetings; Simple verbs; Family terms; School objects; Yes/No questions; Simple adjectives	Friluftsliv outdoor pedagogy takes lessons into nature. Maker-house workshops foster creativity. Sustainability modules connect to real policy. Debate forums develop analytical skills. Art-Science collaborations enrich exploration.
	Secondary	Descriptive writing; Argumentative essays; Grammar exercises; Comprehension passages; Vocabulary building; Report writing; Dialogue practice; Summary tasks; Presentation skills; Critical analysis	NGO partnerships bring real-world context. Circular-economy case studies inspire solutions. Policy hackathons build practical skills. Cross-disciplinary symposiums broaden perspectives. Renewable-energy demos illustrate Technology.
Germany	Basic	Nouns (common objects); Greetings; Action words; Family terms; Numbers; Colors; Simple verbs; Classroom instructions;	“Sachunterricht” maker kits empower student agency. Urban ecology tours connect learners to their city. Research seminar series develop inquiry skills. STEM career expos inspire

		Yes/No questions; Days and months	futures. Science theatre shows engage the public.
	Secondary	Formal/informal writing; Listening tasks; Speaking tasks; Reading informative texts; Vocabulary expansion; Grammar drills; Essay writing; Report writing; Dialogue practice; Comprehension passages	Gymnasium Facharbeit mentorship supports independent research. University-school lab collaborations deepen expertise. Industry R&D visits connect to innovation. Maker-space collaborations foster entrepreneurship. Science fair sponsorships celebrate achievement.
Finland	Basic	Vocabulary (common); Classroom language; Short dialogues; Greetings; Numbers; Colors; Family terms; School vocabulary; Yes/No questions; Simple verbs	Phenomenon-based modules foster holistic understanding. Mobile-lab buses bring Science to remote areas. Equity-focused groups ensure inclusion. Eco-design workshops spark creativity. Digital portfolios showcase growth.
	Secondary	Functional writing (emails, letters); Media text analysis; Discussion facilitation; Grammar review; Comprehension passages; Presentation skills; Report writing; Summary writing; Vocabulary building; Critical reading	National matriculation research projects develop independent study skills. Interdisciplinary labs link chemistry and ecology. Research symposiums nurture scientific discourse. Peer-review workshops build critical analysis. Open-access publishing introduces academic standards.
Tanzania	Basic	Alphabet; Common nouns; Basic verbs; Greetings; Numbers; Colors; Classroom vocabulary; Yes/No questions; Family terms; School objects	Community-health labs merge Science with service. Local-materials workshops teach resourcefulness. Agro-Science camps connect agriculture and biology. Traditional-knowledge seminars honor culture. Mobile-Science roadshows reach remote schools.
	Secondary	Sentence formation; Writing practice; Comprehension passages; Grammar exercises; Vocabulary building; Dialogue scripting; Report writing; Presentation skills; Summary writing; Translation exercises	CSEE practical prep builds exam confidence. NGO collaboration labs illustrate applied research. Research methodology workshops teach rigour. Community outreach programs demonstrate impact. Field case studies connect theory with local challenges.
South Africa	Basic	Everyday English phrases; Greetings; Rhymes; Common nouns; Classroom instructions; Numbers; Colors; Simple verbs; Yes/No questions; Family terms	Ubuntu learning circles foster collaborative inquiry. Community-Science festivals engage the public. Indigenous-knowledge labs bridge tradition and Science. Ethics-inquiry workshops cultivate responsible research. Mobile-Science units expand access.
	Secondary	Grammar drills; Formal writing; Comprehension passages; Dialogue practice; Vocabulary expansion; Report writing; Essay writing; Presentation skills; Summary writing; Peer review	NSC practical assessments uphold standards. Indigenous knowledge exchanges enrich curriculum. Environmental justice forums engage social Science. Community health labs connect biology with service. Peer-research showcases celebrate student work.
Brazil	Basic	English letters; Greetings; Classroom words; Numbers; Colors; Family terms; School objects; Yes/No questions; Simple verbs; Days/months	PNAIC literacy-Science integration supports reading skills. Amazon biodiversity labs connect ecology to identity. Carnival-Science art events merge culture and STEM. Community-engagement labs foster civic

			pride. Bio-diversity fairs showcase local species.
	Secondary	Dialogues; Newspaper reading; Essay writing; Vocabulary building; Grammar exercises; Comprehension passages; Report writing; Summary writing; Presentation skills; Translation exercises	ENEM prep labs align with national exams. Cerrado ecosystem excursions broaden ecological awareness. Agroforestry demonstrations teach sustainable land use. Indigenous community projects champion local knowledge. Sustainability hackathons spark innovation.
USA	Basic	Basic grammar (nouns, verbs); Sight words; Listening tasks; Greetings; Classroom vocabulary; Numbers; Colors; Yes/No questions; Simple sentences; Days/months	NGSS 5E model lessons structure inquiry. Maker-spaces ignite creativity. NASA partnerships inspire space Science. STEM-mentorship programs support underrepresented students. Community Science fairs celebrate innovations.
	Secondary	Functional English (articles, reports); Academic writing; Listening skills; Comprehension passages; Vocabulary building; Grammar review; Essay writing; Presentation skills; Summary writing; Research writing	AP lab collaborations prepare for college. FabLab workshops develop design skills. Research symposiums cultivate academic discourse. Industry mentorships bridge classroom and workplace. Scientific publication clinics teach writing.
Canada	Basic	Greetings; Routines; Vocabulary building; Classroom commands; Numbers; Colors; Simple verbs; Yes/No questions; Family terms; School objects	Provincial inquiry frameworks champion student questions. Indigenous collaborations honor local knowledge. Bilingual exhibits foster inclusivity. Research fairs showcase young scientists. Digital storytelling labs connect tech and narrative.
	Secondary	News articles; Biographies; Functional writing; Academic writing; Grammar exercises; Comprehension passages; Report writing; Presentation skills; Summary writing; Peer review	IB & AP lab modules deepen understanding. Bilingual Science symposiums engage diverse learners. Citizen Science platforms connect students to real research. Policy-brief workshops teach Science communication. Research mentorship programs guide advanced projects.
Australia	Basic	Common words; Phrases; Letters; Greetings; Numbers; Colors; Classroom commands; Yes/No questions; Family terms; School objects	ACARA's Science as a Human Endeavour strand makes Science relevant. Outback expeditions bring fieldwork alive. Reef surveys teach marine biology. Indigenous knowledge integration enriches curriculum. Citizen Science programs build community partnerships.
	Secondary	Writing types (inform, persuade); Speeches; Factual texts; Grammar review; Comprehension passages; Presentation skills; Summary writing; Report writing; Dialogue practice; Research writing	Senior Secondary Research Project fosters independent study. NAPLAN outcome workshops target literacy in Science. Policy hackathons develop real-world solutions. Industry-school partnership labs offer mentorship. Environmental advocacy events connect students to global issues.

Appendix N: Learning facilitation and assessment methods

Country	Level	Facilitation Process	Assessment Methods
Nepal	Basic	Teaching through story making and singing, Inductive method, Role play method and drama, Constructive classroom method, Cooperative classroom, Project method, Discussion and question-answer method, Exploration, research, and inquiry, Technology friendly class, Creative work, Problem solving method, Play way method, Practical method, Self-study and Discussion, Interaction, Examples and application, Audio-voiced based learning facilitation, Inductive method, Problem solving method, Deductive method, Role play method, Model drawing method, Structured problem-solving method, Cooperative learning methods, Discussion and question-answer method, Exploration, research, and inquiry, Teaching through story making and singing, Project method, Play way method, Experimental method, Inductive method, Deductive method, Problem solving method, Exploration and inquiry, Project method, Practical method, Model drawing method, Experimental method, Structured problem-solving method, Play way method, Role play method,	Use of portfolio and continuous assessment Final assessment based on report developed from the portfolio records Classroom participation Oral activities Written activities Project work and practical work Task completion and demonstration Peer evaluation Self-evaluation Parents' reaction Conversation and discussion Internal assessment (50 %) Attendance and learning participation (4 marks) Terminal examination (10 marks) Practical/project work (36 marks) External examination based on specification grid (50 %) Internal assessment (50%) Attendance and participation (4 marks) Terminal exam (10 marks) Practical work/project work (36 marks) Final/External examination based on specification grid (50 % marks)
	Secondary	Construtive learning method, Cooperative learning method, Field trip, Demonstration method, Question-answer method	In secondary level internal assessment allocation for 25 marks including project work, practical activities, terminal examinations, and field work And 75 marks external summative examination conducted by SEE board nationally.
India	Basic	Experiential learning, use of kits and digital content (e-pathshala), collaborative projects, teacher-led discussion	Continuous and comprehensive evaluation (CCE), unit tests, term exams
	Secondary	Concept mapping, practical labs, group discussions, e-learning modules, flipped classroom sessions, teacher-led seminars	CBSE/State board public examinations, internal unit tests, practical viva voce, mid-term exams
Bhutan	Basic	Holistic activity-based pedagogy, learning through play, use of local context examples, peer learning	School-based formative assessments, periodic quizzes, end-of-basic cycle assessments
	Secondary	Lecture-discussion, contextual problem-solving, peer study circles, ICT-supported tutorials, field visits	School final assessments, national examination at Grade 10, continuous class quizzes
Bangladesh	Basic	Child-centred instruction, use of story and song, concrete models, pair and small-group work	Regular class tests, monthly progress reviews, Primary Education Completion examinations
	Secondary	Teacher-guided instruction, collaborative	Secondary School Certificate (SSC)

		assignments, demonstration experiments, e-content, remedial tutorials	exams, term–end tests, project submissions
Sri Lanka	Basic	Inquiry-based learning, use of realia and local materials, group discussions, interactive whiteboards	Formative tests each term, Grade 5 scholarship screening, end-of-primary assessments
	Secondary	Interactive whiteboard lessons, laboratory investigations, group presentations, blended learning, use of local case studies	GCE Ordinary Level exams, end-of-term school assessments, continuous formative evaluations
China	Basic	Teacher-guided instruction, drill and practice with manipulatives, blackboard demonstrations, peer tutoring	Weekly quizzes, mid-term exams, end-of-grade proficiency tests
	Secondary	Structured lectures, practical workshops, peer instruction, multimedia presentations, inquiry projects	Gaokao preparation exams (mock and final), school monthly tests, lab practical assessments
Japan	Basic	Lesson-study approach, hands-on activities, use of geometry tools, student presentations, group inquiry	Frequent short assessments, term exams, teacher observations
	Secondary	Lesson-study collaborative planning, problem-solving workshops, lab work, student presentations, ICT-enhanced instruction	National Center Test for University Admissions, school term exams, teacher assessments
Vietnam	Basic	Textbook-centred lessons, group problem-solving, board work, use of local examples	Classroom quizzes, end-of-semester exams, centralized basic-level testing
	Secondary	Textbook-driven instruction, group problem-solving, laboratory practice, multimedia resources	High School Graduation Examination, end-of-semester exams, classroom quizzes
Singapore	Basic	Concrete–Pictorial–Abstract progression, use of SLS digital resources, model drawing, collaborative tasks	Ongoing formative checks, half-yearly school assessments, end-of-primary PSLE screening
	Secondary	Inquiry-based learning, real-world project work, SLS digital tasks, guided model drawing, collaborative investigations	GCE ‘O’/‘A’-Level examinations, school-based mid-year tests, continual formative checks
Malaysia	Basic	KSSR activity packs, learning corners, ICT-enhanced lessons, cooperative learning	Formative check-points, mid-year exams, end-of-primary UPSR examinations
	Secondary	Jigsaw cooperative learning, ICT-enhanced lectures, laboratory sessions, thematic projects	Sijil Pelajaran Malaysia (SPM) exams, school mid-year assessments, teacher-set quizzes
S. Korea	Basic	5E instructional model (Engage, Explore, Explain, Elaborate, Evaluate), use of workbooks, peer instruction	Periodic teacher-made quizzes, national diagnostic tests, end-of-basic cycle exams
	Secondary	5E model (Engage, Explore, Explain, Elaborate, Evaluate), experiment-based learning, peer coaching, online tutorials	College Scholastic Ability Test (CSAT), school term examinations, diagnostic achievement tests
UK	Basic	Talk-partner work, interactive whiteboard lessons, mastery approach, practical investigations	Teacher-assessed tasks, end-of-Key Stage tests (SATs), ongoing formative feedback
	Secondary	Mastery approach, problem-based learning, practical investigations, flipped lessons, use of virtual labs	GCSE and A-Level exams, teacher-assessed coursework, end-of-year tests
Denmark	Basic	Play-based learning, outdoor Mathematics activities, student-led projects, cross-discipline tasks	Portfolio assessments, formative classroom checks, end-of-year national samples
	Secondary	Project-based work, cross-curricular themes, student-led workshops, outdoor learning	Folkeskolens Afgangsprøve (exit exam), portfolio reviews, national

		activities	sample assessments
Germany	Basic	Guided discovery, use of manipulatives, differentiated small-group work, integration of ICT	Teacher-administered tests, Klassenarbeiten (class exams), end-of-grade standard checks
	Secondary	Guided discovery, lab practicals, seminar discussions, digital learning platforms, differentiated instruction	Abitur examinations, Klassenarbeiten (class tests), oral exams, teacher evaluations
Finland	Basic	Phenomenon-based learning, inquiry and project work, minimal textbooks, collaborative problem-solving	Low-stakes teacher assessments, sample-based national evaluations, portfolio reviews
	Secondary	Phenomenon-based interdisciplinary projects, inquiry labs, student presentations, minimal textbooks, collaborative design tasks	Matriculation Examination, school-based assessments, sample-based national evaluations
Tanzania	Basic	Competency-based teaching, context-relevant examples, group tasks, use of local materials	Continuous school assessments, termly exams, Basic Education Certificate Examination
	Secondary	Competency-based modules, real-life case studies, group workshops, use of local resources	Certificate of Secondary Education Examination (CSEE), termly school exams, continuous assessments
South Africa	Basic	CAPS activity guidelines, use of concrete resources, learner reflection journals, group investigations	Formal school-based assessments, term exams, national ANA diagnostics
	Secondary	CAPS curriculum activities, lab investigations, peer assessments, ICT-supported lessons	National Senior Certificate (NSC) exams, internal school assessments, diagnostic ANA tests
Brazil	Basic	BNCC-aligned projects, contextual problem-solving, use of games and manipulatives, cooperative learning	Regular classroom tests, biannual evaluations, end-of-primary Prova Brasil sampling
	Secondary	Contextual problem-solving, cooperative learning, laboratory experiments, digital simulations	Exame Nacional do Ensino Médio (ENEM), biannual school tests, project work
USA	Basic	Differentiated instruction, manipulatives, math centers, tech integration (apps, smartboards)	Formative exit tickets, quarterly benchmark tests, end-of-grade standardized assessments
	Secondary	Differentiated instruction, lab investigations, math workshops, flipped classroom, online modules	Statewide standardized tests (e.g., SAT/ACT), end-of-course exams, formative exit tickets
Canada	Basic	Provincial inquiry frameworks, hands-on tasks, math talks, use of learning technologies	Classroom quizzes, provincial achievement tests, teacher-led performance tasks assessments
	Secondary	Inquiry-based labs, math seminars, Technology integration, collaborative projects	Provincial diploma exams, classroom assessments, teacher-led performance tasks
Australia	Basic	ACARA-guided inquiry, use of manipulatives and digital tools, group problem-based learning	Ongoing formative observations, mid-year assessments, end-of-primary NAPLAN testing
	Secondary	ACARA inquiry units, real-world project based learning, lab sessions, blended digital lessons	NAPLAN numeracy assessments, school end-of-year exams, ongoing formative observations