ASSESSMENT FRAMEWORK

National Assessment of Student Achievement, Grade 5 (Nepali, English, Mathematics and Science & Technology) 2025

Government of Nepal

Ministry of Education, Science & Technology

Education Review Office

Sanothimi, Bhaktapur

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Forward

Education Review Office (ERO) established in 2010, has been conducting the National Assessment of Student Achievement (NASA) since 2011. ERO has been accomplishing several rounds of national assessments for the students of grades 3, 5, 8, and 10. Consolidating the experiences gained from previous NASA as well as international practices on students' assessment, ERO has been planning for the next rounds of NASA at Grade 5.

NASA Framework 2025 for grade 5 has been prepared in order to guide the assessment process, including items development, sampling, and other methodological design, formulating contextual background questionnaires, and analysing the data. The first chapter of this document includes conceptual discussion on large-scale assessment, norms and criterion criterion-referenced assessment, and assessment framework. Chapter 2 presents an assessment framework for Nepali, English, Mathematics, and Science and Technology subjects of grade 5, which includes identification of the domain to be tested, learning competencies and performance standards, and test specifications for each of the four subjects. Chapters 3 and 4, respectively, include a framework for contextual variables and assessment design.

During the development of this framework, recent international practices on assessment, such as the assessment frameworks for PISA, TIMSS and PIRLS have been reviewed extensively. Besides a large number of subject experts, assessment experts, and subject teachers have contributed to shaping the learning competency, performance standards, and identifying the level of the cognitive domain.

This document is a product of the collaborative efforts of a number of persons and agencies. I acknowledge all of them for their contribution and support during the development and finalisation of this document on the Assessment Framework for National Assessment of Student Achievement for grade 5.

As we consider this a living document, it could be updated and revised if needed. We welcome constructive feedback and suggestions to improve this framework.

Jayaram Adhikari

Director General

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Abbreviations

BPEP	Basic and Primary Education Programme
CERID	Research Center for Educational Innovation and Development
CERSOD	Center for Educational Research and Social Development
CDC	Curriculum Development Centre
CRT	Criterion-Referenced Test
EDSC	Education and Development Service Centre
ERO	Education Review Office
IRT	Item Response Theory
MOEST	Ministry of Education, Science and Technology
NASA	National Assessment of Student Achievement
NCF	National Curriculum Framework
NRT	Norm-Referenced Test
OECD	Organisation for Economic Co-operation and Development
PIRLS	Progress in International Reading Literacy Study
PPS	Probability Proportional to Size
PISA	Programme for International Student Assessment
TIMSS	Trends in International Mathematics and Science
EMIS	Education Management Information System

Contents

Chapter 1
Introduction

1.1 Background

Education Review Office (ERO) is conducting the National Assessment of Student Achievement (NASA) for grades 5, 8, and 10. NASA is "designed to describe the achievement of students in a curriculum area aggregated to provide an estimate of the achievement level in the education system as a whole at a particular age or grade level" (Greaney & Kellaghan, 2008, p.7). As part of the global educational discourse on 'quality education' and accountability, national assessments are conducted to provide policy inputs to the Ministry of Education, Science, and Technology (MoEST) with critical insights into evaluating the overall effectiveness of educational policies and practices in terms of student achievement. By providing large-scale data on student achievement, national assessments support the education system in assessing its educational policies and programs.

This assessment framework for Nepali, English, Mathematics, Science and Technology subjects in Grade 5 has been prepared with an overall guideline to conduct national assessments of student achievement in these subjects. This framework includes four chapters. The first chapter deals with the rationale and practices of national assessment; introduction of criteria and standard-referenced tests; development of criteria and standards; introduction to the assessment framework; and the methods/processes of developing this framework.

The second chapter presents the assessment frameworks for Nepali, English, Mathematics, Science and Technology. Similarly, Chapter 3 discusses the methodology that will be adopted to carry out NASA for Grade 5. Finally, Chapter 4 presents a framework for assessing contextual factors for student achievement, based on the review of national and international studies. This chapter begins with a brief discussion on the rationale for national assessments.

1.2 Rationale for National Assessment

The main purpose of national assessment is to provide evidence with data for "a type of national education audit carried out to inform policymakers about key aspects of the system" (Greaney & Kellaghan, 2008, p. 7). By focusing on the output aspect of the education system, national assessment is conducted to address the following general questions:

- To what extent are students learning in different subject areas and grades?
- How well are students from particular groups (e.g., gender, ethnicity, geography, and language backgrounds) learning?
- What are the strengths and weaknesses in the existing level of student achievement?
- What are the factors affecting student achievement?
- What resources are available to meet the standard of the government in terms of student achievement?
- Does the level of student achievement change over time?
- What factors influence that change?

In addressing these questions, national assessments not only provide information on the status of student achievements but also offer significant ideas towards the improvement of learning outcomes. Put it differently, national assessments are conducted for both backward- and forward-looking purposes. The backward-looking purpose is concerned mainly with building a database to analyse both the strengths and weaknesses of educational policies and practices that affect students' learning achievement. Similarly, the forward-looking purpose is concerned with changing the policy and reforming education programs and interventions.

National assessment provides information that helps policy-makers to understand the change in students' learning achievement over time. Likewise, it collects data related to the factors affecting learning achievement, which becomes a basis for policy-makers to revise existing policies and guide them to reformulate new ones to strengthen the quality of education (Poudel, 2017).

In addition, national assessments contribute to ensuring equality and access for all children in education. As they provide database evidence on learning achievement in terms of gender, ethnicity, language background, and geographic region, national assessments help policy-makers to understand which groups are performing better and which groups are not. This understanding eventually offers significant insights into creating new policies and designing targeted interventions to ensure equality in education (Poudel, 2016).

As Murphy et. al (1996) claim, national assessments provide "systematic, regular measures of learning achievement in a country that are designed to assist policymaking" (p. 2). Studies from around the globe have also shown that national assessments have been instrumental in policy reforms addressing quality, equity, and access to education (Greaney & Kellaghan, 2008).

1.3 Practice of National Assessment

National assessment is a global practice, and it has a long history as well. The primary focus of national assessment is also similar to other assessments: to inform governments about what reforms are necessary to improve the quality of students' learning from diverse social groups. In Nepal, national assessments of student achievement began in 1995 to assess the basic and primary education program. Before the establishment of Education Review Office (ERO) in 2010, Basic and Primary Education Programme (BPEP) and Department of Education commissioned agencies such as the Education and Development Service Centre (EDSC), Research Center for Educational Innovation and Development (CERID), Center for Educational Research and Social Development (CERSOD) and Fulbright to conduct national assessments of student achievement of various grades.

Since 2011, ERO has completed national assessments of students' achievement in Nepali, English, Mathematics, and Social studies of Grade 8 first time. Then, ERO has conducted different assessments of Grade 8 in 2013, 2017 and 2020. Similarly, NASA for Grade 5 was conducted in 2012, 2015, 2018, and 2022. Likewise, assessment in Grade 10 was conducted in 2019 and 2023. Similarly, the NARN was conducted in 2020 and 2023 as a hybrid model of assessment.

Nepal follows globally accepted practices of conducting national assessments. Although the context of each country is different, there are some major practices that are common to national assessments in all countries. Building on a comprehensive review of national assessments from various countries, in the case of Nepal, the following are the common elements of national assessments:

- The Education Review Office (ERO) is responsible for the national assessment in Nepal.
- ERO develops policies and frameworks for the assessment in consultation with and participation of key stakeholders such as subject experts, teachers, and policymakers.
- ERO takes transitional grades of school educational structure and determines the assessment area/subjects (e.g., literacy or numeracy) to be assessed.
- ERO defines and describes the area of achievement in terms of both content and cognitive skills and develops test items along with supporting questionnaires and manuals for test administration.
- ERO pilot-tests the test with the support of the external experts, reviews its validity, appropriateness, and sensitivity in terms of gender, ethnicity, and culture.
- ERO ensures that the assessment instruments are reliable and valid.
- ERO samples the schools; makes an arrangement for printing the test and other relevant materials; and communicates with the schools and teachers for test administration.
- ERO provides training to test administrators (focal persons, headteachers, and teachers) and administers the test and other survey questionnaires in the selected schools.
- ERO generates achievement test scores and other necessary information, cleans the data, and analyses it.
- ERO prepares draft reports, which the relevant subject committees and external experts will review.
- ERO prepares and disseminates final reports through various means, such as publication and through mass media.
- The MoEST, ERO and relevant stakeholders use the reports and identify the major areas for policy reforms and program interventions.

ERO is going to conduct the NASA Grade 5 in Nepali, English, Mathematics, and Science and Technology in 2026. In this process, as presented in Figure 1, the MoEST approves the program and budget. ERO develops an assessment framework and designs samples for NASA. After that, working with experts and teachers, ERO analyses the curriculum and develops criteria and performance standards in each subject. Then, ERO works with the subject committees to approve the test items for assessment. At the same time, working with experts and practitioners, ERO prepares background questionnaires for students, teachers, and head teachers.

The test items developed by the subject experts will be pre-tested to check their quality, reliability, and validity. Following this, the test items will be revised and finalized by incorporating ideas from the analyses of pre-test results. The test will be administered in the selected schools, followed by marking, data entry, and data cleaning. Then, the data will be analysed and test scores will be equated using IRT modelling. Finally, the reports will be prepared and disseminated among the relevant stakeholders with MoEST and its agencies.

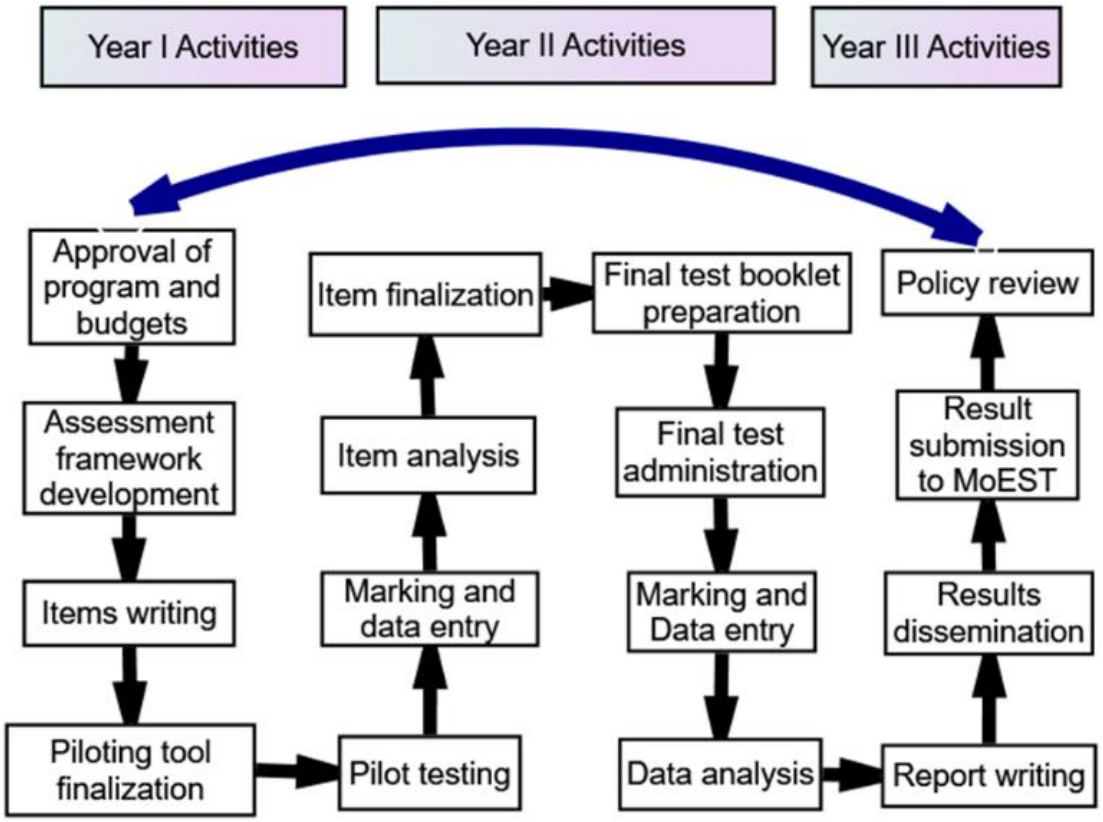

Figure 1: NASA Cycle (ERO)

1.4 Criteria and Standard Referenced Assessment

The upcoming NASA for Grade 5 (Nepali, English, Mathematics and Science and Technology) will adopt a criterion-referenced test (CRT) approach. CRT is a popular approach for assessing students' achievement in specific content areas and skills. Rather than comparing students' scores with the scores of a certain group of students, CRT provides information on how individuals or groups are progressing in specific subject areas (Kubiszyn & Borich, 2007). In other words, CRT assesses whether or not individuals have achieved or failed to achieve specific instructional objectives. The purpose of CRT is to diagnose students' existing learning achievement and identify what progress they have made over time. CRT also helps policymakers to identify what students have not learned yet and what they are expected to learn (Bond, 1996).

In CRT, students are assessed against a predetermined set of 'criteria' and expected to obtain specific marks that define their 'standard'. Criteria, in CRT, are characteristics by which the qualities of students' achievement are judged. Such criteria are determined on the basis of learning objectives set by the national curriculum from specific courses that students are expected to learn. For each criterion, standards are developed that work as a benchmark to identify the level of student achievement.

Standards can be labelled as 'excellent', 'proficient', 'fail', among other options, based on the marks students achieve. Other common terms to label standards are 'grades' (numbers), 'letters', 'bands', and 'marks'.

Table 1 Popular terms to label standards

Marks	32	50	80	100
Letters	D	C	B	A
% Bands	0-39%	40-59%	60-89%	80-100%
Labels	Fail/poor	Competent/average	Advanced/good	Outstanding/Excellent

Although standards vary for different subject areas, they should be consistent with the criteria that are developed to assess students' achievement. More importantly, each standard should be clearly described in terms of the expected quality of achievement. Yet, standards should not be so hard that students cannot succeed, nor should they be so low that all students succeed at the highest level. In addition, each standard should be described clearly and concisely from the national curriculum so that all students can understand the test and what they are expected to perform.

For the national assessment of Grade 5 Nepali, English, Mathematics, and Science and Technology, a group of subject experts develops both criteria and standards in each subject. The standards adopted in NASA 2017 and 2019 for Grades 5 and 10 are a useful reference to develop the standards for NASA 2025. In NASA 2017, there are four levels of standards: below-basic, basic, proficient, and advanced, based on students' performance on different levels of test items. These criteria and standards are informed by both global and national theories and the curriculum framework.

1.5 Developing Criteria and Standards for an Assessment

In order to maintain valididity and reliability of NASA test, ERO develops criteria and standards for NASA. ERO has organised several meetings of teachers and experts to define criteria and standards by analysing the approved curriculum. Similarly, ERO has formed subject committees that are comprised of subject teachers, assessment experts, and experts from universities. These committees and experts refine the criteria and standards by reviewing

national curricula, literature, and past test items. National curriculum framework (NCF) is taken as the base to define content and criteria for different subjects.

The development of test items based on CRT, first, requires a specification of competencies from the learning goals of the curriculum. Each learning objective should be specified into related competencies, which can be presented as criteria against which students' learning achievement can be assessed. The competencies should be measurable, clear and specific, and relevant to students. Second, standards for each competency should be determined; standards could be letters, marks and bands. After this, test items should be written in line with the competencies and their standards. Such test items should be valid, reliable and fair.

1.6 Assessment Framework

ERO follows its own NASA framework; it draws on international theories and practices of assessing students' learning achievement to ensure that the entire assessment process becomes theoretically valid and reliable.

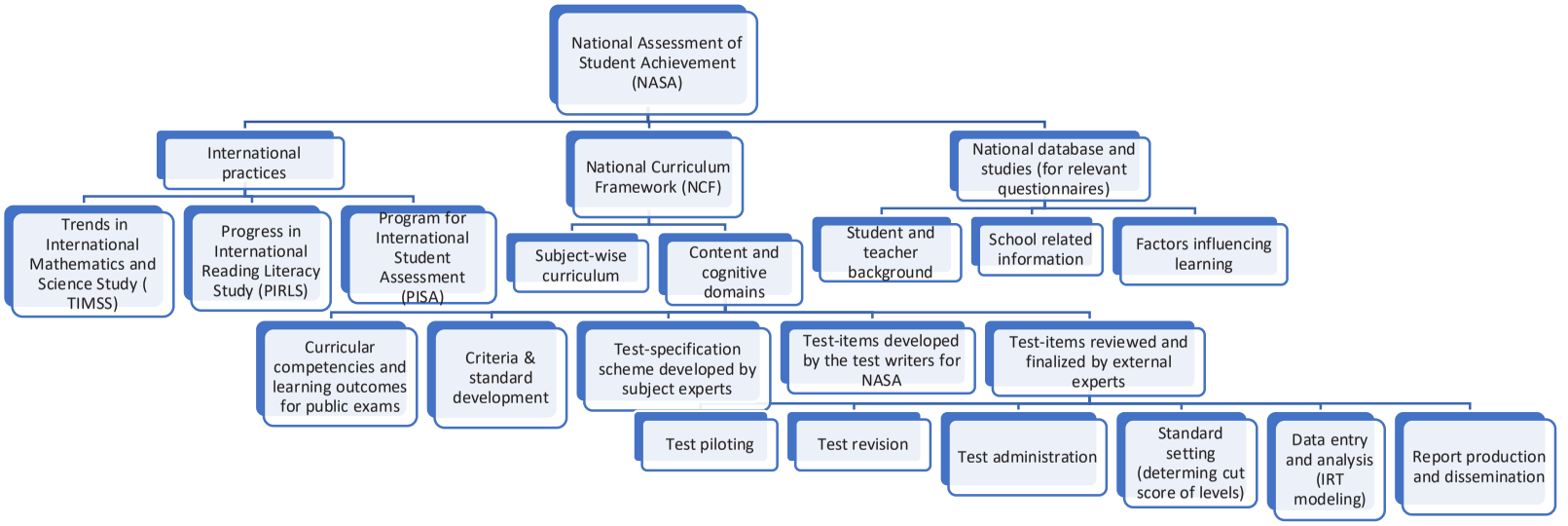

Figure 2: Overall framework for national assessment (ERO)

As presented in the Figure 2, this famework is guided by international practices and NCF: developing and administering test items, producing reports, and discussing factors influencing learning achievements. The major source of information is the national curriculum framework (NCF) and subject-specific curriculum, which guides the overall NASA framework. NCF, which serves as a base for identifying learning goals for different subjects, is prepared by the CDC/MoEST. The content and cognitive domains that are used for the test construction are identified from the curricula of specific subjects. Although NASA prepares test items based on the specific scheme prepared by the experts, it also draws on insights from the learning outcomes and goals from the national curriculum framework. Based on those learning outcomes, the subject expert teacher develops test items, which will be reviewed and finalized by the subject committee. Before finalizing the test items pre-test has been conducted to identify item difficulty, reliability and discrimination index. Based on these criterias, items have been selected to administer the final test. IRT (Item Response Theory) is used to analyse the final assessment data. At the end, the final reports are produced and disseminated among the relevant stakeholders.

NASA draws on data related to different variables such as gender, ethnicity, language, age, and geographical regions to develop a questionnaire related to the background information of students, teachers, and schools. International practices and theories on the assessment of student achievement also provide insights into shaping the NASA framework in Nepal. Although Nepal has its constraints, a study indicates that adapting international frameworks can help Nepal to make its NASA framework more rigorous, valid, and reliable in terms of identifying the actual quality of student learning. For this, they also suggest that instead of participating in these international assessments at this point, Nepal may use some linking items from these tests and compare the results using IRT. As shown in figure, some popular international practices include Trends in International Mathematics and Science Study (TIMSS), Progress in International Literacy Study (PIRLS), and Program for International Student Assessment (PISA). In addition to providing ideas for specifying content and cognitive domains, these international assessment practices also focus on contextual factors influencing learning achievement. In Nepalese context, factors related to peer group, students themselves, home/family, demographics, teacher, economic status, school, physical conditions and leadership are considered as key factors influencing students' learning achievement.

1.7 Method and Process Used to Develop Assessment Framework

A collaborative approach has been adopted to develop this assessment framework. For this purpose, ERO conducted, in a series of meetings, with stakeholders and other officials to make the framework comprehensive. Following their suggestions and feedback, ERO reviewed the previous NASA studies from Nepal and other countries. We went through several literatures on the assessment of students' learning achievement to better understand both the theories and practices of achievement assessment. For the subject-specific framework, we worked closely with the relevant subject experts and subject committees. The initial draft of criteria and standards for each subject prepared in the workshops of subject teachers and experts has been updated and revised with the inputs from the experts and subject committees.

Chapter 2

Subject-wise Assessment Framework

2.1 नेपाली विषयको परीक्षण ढाँचा

परिचय

विद्यार्थीको सिकाइ उपलब्धि मापन र निर्धारणका लागि राष्ट्रिय परीक्षण गरिन्छ । विश्वका धेरै मुलुकमा शिक्षाको गुणस्तर मापन गर्ने साधनका रूपमा विद्यार्थी उपलब्धिको राष्ट्रिय परीक्षणलाई मान्यता दिइएको छ । यस्तो परीक्षणले मूलत: विद्यार्थीको सिकाइ स्तरलाई सङ्ख्यात्मक रूपमा प्रस्तुत गर्छ । यस किसिमको परीक्षणबाट पाठ्यक्रमले तोकेका सिकाइ उपलब्धिको मापन गरी विद्यार्थीको प्राप्ताङ्कका आधारमा उनीहरूको क्षमताको आकलन गरी विश्लेषणसमेत गरिन्छ । यस्तो परीक्षणले नीति निर्माता र शैक्षिक सरोकारवालाका लागि सिकाइ स्तरमा सुधार ल्याउन आधारभूत सूचना उपलब्ध गराउँछ । यस कार्यबाट सम्बन्धित पक्षलाई शिक्षामा गुणस्तर सुनिश्चितता गर्न आवश्यक पर्ने कार्यक्रम र रणनीतिमा समयानुकूल परिमार्जन गर्नसमेत सहयोग पुग्छ ।

नेपाली भाषाको शिक्षणबाट विद्यार्थीमा भाषिक सिपको विकास गराउने उद्देश्य राखिएको छ । आधारभूत तहमा (कक्षा ५) नेपाली विषयको शिक्षणबाट बोध तथा अभिव्यक्तिगत सक्षमता हासिल हुने अपेक्षा गरिएको छ । कक्षा ५ का लागि निर्धारण गरेका सिकाइ सक्षमता तथा कक्षागत सिकाइ उपलब्धिका आधारमा यो परीक्षण ढाँचा विकास गरिएको छ । यो परीक्षण ढाँचाले शैक्षिक गुणस्तर परीक्षण केन्द्रले सञ्चालन गर्ने कक्षा ५ को सिकाइ उपलब्धि परीक्षणका लागि तयार पारिने प्रश्न निर्माण गर्न र त्यसबाट आएको नतिजालाई व्याख्या विश्लेषण गर्न आधार प्रदान गर्ने छ । कक्षा ५ का विद्यार्थीमा नेपाली भाषामा हुनुपर्ने न्यूनतम सिकाइ उपलब्धि कुन स्तरमा हासिल भएको छ भन्ने प्रामाणिक आधार लिनका लागि भाषिक सिप परीक्षण एक महत्त्वपूर्ण कार्यप्रक्रिया हो । यो कार्यलाई वस्तुगत र विश्वसनीय बनाउन त्यसका आधारलाई सकेसम्म वस्तुनिष्ठ बनाउनका लागि यो परीक्षण ढाँचा उपयोगी हुने छ ।

यो परीक्षण ढाँचामा विद्यार्थीमा हुने सिकाइ स्तरलाई चार स्तरमा विभाजन गरिएको छ । सिकाइ सक्षमताका चार स्तरमा कक्षा ५ को नेपाली भाषा पाठ्यक्रमको उद्देश्यका आधारमा परीक्षण क्षेत्र र विषयवस्तु निर्धारण गरिएको छ । सिकाइ सक्षमताका स्तरको खाका प्रस्तुतिपछि सम्भाव्य संज्ञानात्मक क्षेत्रको पहिचानका साथै प्रश्नपत्र तयार गर्नका लागि विशिष्टीकरण तालिका प्रस्तुत गरिएको छ । यो ढाँचा तयार पार्दा स्तर निर्धारण र संज्ञानात्मक क्षेत्रसम्बन्धी सिद्धान्त र अभ्यास, सम्बद्ध शिक्षक, विशेषज्ञ एवम् संस्थागत अनुभवलाई समेत उपयोग गरिएको छ । तहअनुसारको सिकाइस्तरलाई वस्तुगत किसिमले व्याख्या गरिएको छ । भाषिक सिकाइका चार सिपमध्ये पढाइ र लेखाइका सिकाइ उपलब्धि मात्र यस परीक्षण ढाँचामा समाविष्ट छन् । आधारभूत तह (कक्षा ५) को स्वीकृत पाठ्यक्रममा उल्लेख गरिएका सिकाइ उपलब्धि र त्यसको विस्तृतीकरणका आधारमा यो परीक्षण ढाँचा विकास गरिएको हुनाले यसमा प्रयोग भएका तह र स्तर भन्नाले आधारभूत तह कक्षा ५ को पाठ्यक्रममा आधारित भई विद्यार्थीले हासिल गरेको सिकाइको स्तरलाई बुझाउने छ । पाठ्यक्रममा निर्धारित भाषिक सिपमा सक्षमता विकास गर्न कविता, कथा, निबन्ध, जीवनी, व्यावहारिक लेखन र रूपक विधाका सामग्री पाठ्यपुस्तकमा समावेश गरिएका छन् । पाठ्यवस्तुका रूपमा रहेका विधा शिक्षण सिकाइबाट पाठ्यक्रमद्वारा निर्धारित भाषिक सिपमा सक्षमता हासिल भए नभएको सुनिश्चित गर्न सिकाइ परीक्षण तथा मूल्याङ्कन ढाँचा निर्धारित गरिएको छ ।

नेपाली विषय कक्षा ५ को विद्यार्थी उपलब्धि परीक्षणको उद्देश्य

१. पाठ्यक्रममा आधारित भएर विद्यार्थीको पढाइ र लेखाइ सिपसँग सम्बन्धित सिकाइ अवस्थाको पहिचान गर्नु
२. कक्षा ५ का विद्यार्थीको नेपाली विषयमा औसत सिकाइ उपलब्धिको लेखाजोखा गर्नु
३. लिङ्ग, जाति, भाषा, सामाजिक तथा आर्थिक अवस्था, भौगोलिक अवस्थितिलगायत चर र त्यसको प्रभावका आधारमा विद्यार्थीको सिकाइ उपलब्धिको विश्लेषण गर्नु
४. विद्यार्थीको सिकाइ उपलब्धिमा प्रभाव पार्ने प्रमुख तत्त्वको पहिचान र विश्लेषण गर्नु
५. विभिन्न समयमा गरिने विद्यार्थीको सिकाइ उपलब्धिको तुलना गर्नु
६. विद्यालय शिक्षामा गुणस्तर र समताको अभिवृद्धि र सुनिश्चितताका लागि सम्बन्धित पक्षलाई सुझाव उपलब्ध गराउनु

तहगत सक्षमता (कक्षा ४ र ५)

आधारभूत शिक्षा (४-५) को अध्ययनपश्चात् विद्यार्थीमा नेपाली भाषाका निम्नलिखित सक्षमता हासिल हुने छन्:

१. शब्दको अक्षर संरचनागत ध्वनि सचेततासहितको उच्चारण
२. विविध विषयवस्तुमा आधारित मौखिक तथा लिखित सञ्चार
३. पाठको प्रवाहपूर्ण पठन गरी विषयवस्तुको बोध र सन्दर्भपरक अभिव्यक्ति
४. विभिन्न पाठ्यसामग्रीबाट तथ्य, मूल्य एवम् विचार ग्रहण गरी भाषिक कार्य सम्पादन
५. चित्र, वस्तु, घटना, परिवेश र पाठगत सन्दर्भका आधारमा विषयवस्तुको बोध र तार्किक अभिव्यक्ति
६. सामाजिक र सांस्कृतिक मूल्यप्रति सचेततासहित भाषाको शिष्ट प्रयोग
७. भाषिक प्रकार्यका आधारमा सन्दर्भगत भाषाको प्रयोग
८. दैनिक व्यवहारका लागि आवश्यक मानक भाषाको प्रयोग
९. सिर्जनात्मक तथा समालोचनात्मक सिपको उपयोग गरी भाषिक सञ्चार र समस्या समाधान

कक्षागत सिकाइ उपलब्धि (कक्षा ५)

(क) पढाइ

सिकाइ उपलब्धि	सिकाइ उपलब्धिको विस्तृतीकरण
१. लिखित सामग्रीलाई गति, यति, लय मिलाई शुद्ध र स्पष्टसँग वाचन गर्न	१.१ पद्य पाठलाई गति, यति, लय मिलाई शुद्ध र स्पष्टसँग वाचन गर्न १.२ गद्य पाठलाई गति, यति, हाउभाउसहित शुद्ध र स्पष्टसँग वाचन गर्न १.३ विभिन्न विधाका पाठ आशयअनुसार चिह्नको ख्याल गरी पढ्न १.४ विभिन्न विधाका पाठ पूर्वानुमान र पश्चानुमान गर्न सक्ने गरी पढ्न
२. अरूलाई बताउन सक्ने गरी विषयवस्तु पढ्न	२.१ आफूले पढेका विषयवस्तु व्यक्त गर्न २.२ पाठमा प्रयुक्त पात्रको परिचय बताउन २.३ पढेका विषयवस्तुको सार बताउन
३. पाठमा पढेका विषयवस्तुको मौखिक उत्तर दिन	३.१ निर्धारित पाठ पढी मौखिक अभिव्यक्ति दिन ३.२ निर्धारित पाठ वा अंश पढी सन्दर्भ र परिवेशमा आधारित प्रश्नोत्तर गर्न ३.३ पाठगत, शैलीगत र अनुमानात्मक प्रश्नको उत्तर दिन ३.४ पढेका विषयवस्तुका बारेमा प्रश्न निर्माण गर्न
४. पाठका प्रयुक्त नयाँ शब्दको अर्थ बुझ्ने गरी पढ्न	४.१ पाठमा प्रयुक्त नयाँ शब्द पहिचान गर्न ४.२ पाठमा प्रयुक्त नयाँ शब्दको अर्थ बोध गर्ने गरी पढ्न ४.३ शब्दभण्डार वृद्धि गर्ने गरी विभिन्न पाठ पढ्न ४.४ पाठगत संरचना बोध गर्ने गरी पढ्न
५. मुद्रित तथा विद्युतीय सामग्री रुचिपूर्वक पढ्न	५.१ मुद्रित तथा विद्युतीय सामग्री पढेर विषयवस्तु बोध गरी आशय बताउन ५.२ भित्तेपात्रो पढी सूचना वर्णन गर्न ५.३ बाल सामग्रीहरू रुचिपूर्वक पढ्न ५.४ चिठी, पत्रपत्रिका, विज्ञापन र निमन्त्रणा पढेर विषयवस्तु बोध गर्न ५.५ चिठी र निमन्त्रणा पत्रको ढाँचा बोध गर्न

(ख) लेखाइ

सिकाइ उपलब्धि	सिकाइ उपलब्धिको विस्तृतीकरण
१. विषयवस्तुको लिखित वर्णन गर्न	१.१ दिइएका विषयमा लिखित वर्णन गर्न १.२ आफूलाई मन पर्ने विषयमा स्वतन्त्र लेखन गर्न १.३ निर्दिष्ट विषयमा अनुच्छेद लेखन गर्न
२. लेख्य चिह्न र हिज्जे मिलाई शुद्धसँग अनुलेखन र श्रुतिलेखन गर्न	२.१ लेख्य चिह्न र वर्णविन्यास मिलाई अनुच्छेदको अनुलेखन गर्न २.२ लेख्य चिह्न र वर्णविन्यास मिलाई अनुच्छेदको श्रुतिलेखन गर्न २.३ दिइएका बुँदाका आधारमा निर्देशित लेखन गर्न २.४ पूर्णविराम, प्रश्नवाचक, योजक, अल्पविराम, उद्धरण र विस्मयादिबोधक चिह्न प्रयोग गरी वाक्य वा अनुच्छेद लेख्न
३. आफूले सुनेका, देखेका र अनुभव गरेका घटनाको लिखित वर्णन गर्न	३.१ आफूले सुनेका, देखेका र अनुभव गरेका घटना र विषयवस्तुको लिखित वर्णन गर्न ३.२ वाक्य गठन र सङ्गति मिलाई विषयवस्तुको वर्णन गर्न ३.३ पढेका विषयवस्तुबाट नयाँ शब्द सङ्कलन गरी वाक्यमा प्रयोग गर्न
४. संरचना बोध गरी व्यावहारिक रचना तयार गर्न	४.१ घरायसी चिठी, निमन्त्रणा र निवेदनको ढाँचा अनुकरण गर्न ४.२ घरायसी चिठी र निवेदन लेख्न
५. पदसङ्गति मिलाई वाक्य र अनुच्छेद लेख्न	५.१ लिङ्ग, वचन, पुरुष र आदर मिले नमिलेका वाक्य पहिचान गर्न ५.२ लिङ्ग, वचन, पुरुष र आदर प्रयोग गरी वाक्य लेख्न ५.३ लिङ्ग, वचन, पुरुष र आदर प्रयोग गरी अनुच्छेद लेख्न ५.४ वाक्यमा लिङ्ग, वचन, पुरुष र आदर परिवर्तन गर्न
६. भाषिक संरचनाको समुचित प्रयोगसहित पाठ रचना गर्न	६.१ अनुच्छेदमा प्रयुक्त नाम, सर्वनाम, विशेषण, क्रिया, नामयोगी, क्रियायोगी, संयोजक, विस्मयादिबोधक र निपात पहिचान गर्न र वाक्य वा अनुच्छेद रचना गर्न

सिकाइ उपलब्धि	सिकाइ उपलब्धिको विस्तृतीकरण
	६.२ काल, पक्ष, करण र अकरणका आधारमा वाक्य तथा पाठको रचना गर्न ६.३ सङ्केतका आधारमा वाक्य परिवर्तन गर्न ६.४ कारक र विभक्तिको पहिचान र प्रयोग गर्न
७.१ निर्देशित, अनुकरणात्मक र स्वतन्त्र रचना गर्न ७.२ सिर्जनात्मक र समालोचनात्मक सिपको उपयोग गरी भाषिक सञ्चार र समस्या समाधान गर्न	७.१ कुनै विषयमा निर्देशित लेखन (गद्य र पद्य) गर्न ७.२ कुनै विषयमा अनुकरणात्मक लेखन गर्न ७.३ कुनै विषयमा स्वतन्त्र लेखन गर्न ७.४ पढेका पद्यांश गद्यमा रूपान्तरण गर्न ७.५ निर्धारित घटना, विषयवस्तु र सन्दर्भका आधारमा समस्या, कारण र निष्कर्ष टिपोट गर्न ७.६ मौखिक तथा लिखित अभिव्यक्तिमा निहित त्रुटि पहिचान गरी सच्याएर लेख्न

भाषिक विषयवस्तुको क्षेत्र, मापदण्ड र स्तर

प्रस्तुत ढाँचा कक्षा ५ पूरा गरेका विद्यार्थीको सिकाइ उपलब्धिको राष्ट्रिय परीक्षण (NASA) का लागि तयार पारिएको हो । उक्त विद्यार्थीले हासिल गरेका सिकाइ उपलब्धि विश्लेषणको आधारस्वरूप यो ढाँचा तयार गरिएको छ । यो ढाँचा पढाइ र लेखाइसँग सम्बद्ध सक्षमता परीक्षण एवम् विश्लेषणका आधारमा मात्र तय गरिएको हो । निर्धारित आधार तथा उपलब्धिको सिपगत स्तरअन्तर्गत माथिल्लो स्तरमा तल्लो तहका सक्षमता समेटिएका छन् ।

यस उपलब्धि परीक्षणमा पढाइ र लेखाइका सिप मात्र परीक्षण गरिने भएकाले यसमा सुनाइ र बोलाइका सिपसम्बन्धी क्षेत्र तथा स्तर समावेश गरिएका छैनन् । यो विद्यार्थी सिकाइ उपलब्धि परीक्षण प्रयोजनका लागि पढाइ र लेखाइका क्षेत्रबाट परीक्षा साधन निर्माण गरी सिकाइ उपलब्धि परीक्षण गर्ने गरी स्तर निर्धारणको आधार तयार गरिएको छ ।

शब्दभण्डार, व्याकरण तथा वर्णविन्यासलाई अलग्गै विषयवस्तुका रूपमा समावेश नगरी पढाइ र लेखाइका क्षेत्रमै समावेश गरिएको छ । उल्लिखित भाषिक सक्षमता स्तरका आधारमा पाठ्यक्रमद्वारा निर्दिष्ट विषय तथा पाठ्यवस्तु क्षेत्र र भाषिक सिपगत सिकाइस्तरको विस्तृत विवरण तयार पारिएको छ । यसको खाका तलको तालिकामा प्रस्तुत गरिएको छ ।

कक्षा ५ को नेपाली विषयको सिकाइ उपलब्धिको लागि स्तर र तिनको व्याख्या

पढाइ

आधार	स्तर र तह	सक्षमता	सक्षमताको व्याख्या
१. विभिन्न विषयक्षेत्रमा आधारित आख्यानात्मक अनुच्छेदको बोध २. विभिन्न विषयवस्तुमा आधारित निबन्धात्मक अनुच्छेदको बोध ३. संवादात्मक/संस्मरण/दैनिकीसँग सम्बन्धित अनुच्छेदको बोध ४. सूचना/भित्तेपात्रो/तालिका	न्यून आधारभूत सक्षमता (Below-basic) तह १	अनुच्छेदमा रहेका विषयवस्तुको न्यूनतम बोध	• अनुच्छेदबाट वस्तु, स्थान, व्यक्तिसँग सम्बन्धित एउटै वाक्यमा रहेका प्रत्यक्ष सूचना ठम्याउन • घटनाको पहिचान तथा क्रम मिलान गर्न • चित्र, तालिका तथा नक्साको सन्देश बोध र विषयवस्तुप्रति वस्तुपरक प्रतिक्रिया दिन
	आधारभूत सक्षमता (Basic) तह २	अनुच्छेदमा रहेका प्रमुख घटना र मुख्य सूचना बोध	• एउटै अनुच्छेदको दुई वा दुइभन्दा बढी वाक्यमा छरिएर रहेका सूचनालाई पहिचान गर्न • पाठमा प्रयुक्त सूचनाको आशय बोध गर्न • घटनाको पहिचान, क्रम मिलान र अनुमान गर्न • वाक्यको आशय, सूचना र संरचना बोध गर्न • विचारको आंशिक रूपमा विश्लेषण गर्न • चित्र, नक्सा, तालिका र चार्टको सूचना, सन्देश र साङ्ख्यिकी पहिचान गरी प्रतिक्रिया दिन
	प्रवीणता (Proficient) तह ३	अनुच्छेदमा रहेका प्रमुख घटना र मुख्य सूचना	• विभिन्न अनुच्छेदमा छरिएर रहेका सूचना पहिचान गर्न • पाठको उद्देश्य र आशय बोध गर्न • घटनाको पहिचान, क्रम मिलान गर्न • सूचनाको संश्लेषण तथा तर्कपूर्ण विश्लेषण गर्न

आधार	स्तर र तह	सक्षमता	सक्षमताको व्याख्या
(कक्षा तालिका, परीक्षा तालिका, साप्ताहिक खाजा तालिका आदि) को बोध		बोध गरी विश्लेषण	• चित्र, तालिका, नक्सा, चार्टको सूचना, आशय र तथ्याङ्क विश्लेषण गर्न
	विशिष्ट (Advanced) तह ४	• अनुच्छेदमा रहेका प्रमुख घटना र मुख्य सूचना बोध गरी स्तरीय विश्लेषण	• अनुच्छेदमा स्पष्ट रूपमा उल्लेख नभएको तर सङ्केतको आधारमा मात्र सूचना तथा जानकारीलाई संश्लेषण गरेर आधारभूत निष्कर्ष निकाल्न • पाठमा प्रयुक्त मुख्य भाव र आशय बोध गर्न, घटना पहिचान, तार्किक अनुमान र जिज्ञासामूलक प्रश्नको समाधान गर्न • पाठको उद्देश्यसहितको निष्कर्ष निकाल्न र सूचनाको भाव बुझी विश्लेषण र संश्लेषण गर्न • चित्र नक्सा, तालिका र चार्टको निष्कर्ष, सार, समानता वा भिन्नता पहिचान गर्न • उदाहरणसहित तार्किक प्रतिक्रिया दिन

लेखाइ

आधार	स्तर र तह	सक्षमता	सक्षमताको व्याख्या
१. व्यावहारिक लेखन (निवेदन र घरायसी चिठी) २. निर्देशित (कथा, जीवनी, संवाद) लेखन ३. स्वतन्त्र लेखन (अनुच्छेद)	न्यून आधारभूत सक्षमता (Below-basic) तह १	तोकिएको संरचना र विषयवस्तुको न्यूनतम अभिव्यक्ति	• चिठी र निवेदन आदि भेद नछुट्याई लेख्न । • निर्देशित बुँदाका आधारमा क्रियापद मात्र राखी कथा, जीवनी, संवाद तयार गर्न • स्वतन्त्र शीर्षकमा आधारित ५/६ वाक्यमा अनुच्छेद लेख्न
	आधारभूत सक्षमता (Basic) तह २	तोकिएको संरचना र विषयवस्तुको आंशिक अभिव्यक्ति	• सामान्य ढाँचामा चिठी र निवेदन लेख्न • निर्देशित बुँदाका आधारमा सन्दर्भसहित कथा, जीवन, संवाद तयार गर्न • स्वतन्त्र शीर्षकमा आधारित भई ८/१० वाक्यमा अनुच्छेद लेख्न
	प्रवीणता (Proficiency) तह ३	तोकिएको संरचना र विषयवस्तुका लागि आवश्यक तत्त्वको संयोजनसहितको अभिव्यक्ति	• ढाँचासहित चिठी र निवेदन लेख्न • निर्देशित बुँदाका आधारमा आदि, मध्य र अन्त्यको संरचनासहित कथा, जीवनी, संवाद तयार गर्न • आदि, मध्य र अन्त्यको संरचनामा अनुच्छेद लेख्न
	विशिष्ट (Advanced) तह ४	• तोकिएको कक्षास्तरको क्षमताको विश्लेषणात्मक अभिव्यक्ति	• ढाँचासहित मौलिक चिठी र निवेदन लेख्न • निर्देशित बुँदाका आधारमा आदि, मध्य र अन्त्यको संरचनासहित मौलिक कथा, जीवनी, संवाद तयार गर्न • आदि, मध्य र अन्त्यको संरचनामा मौलिक अनुच्छेद लेख्न

संज्ञानात्मक क्षेत्र र संज्ञानात्मक क्षेत्रका अङ्कभार

शिक्षण सिकाइको प्रक्रियाद्वारा विद्यार्थीमा संज्ञानात्मक क्षेत्रका विभिन्न तहका क्षमता विकास भए नभएको मापन गर्न परीक्षण साधन तथा प्रश्नले संज्ञानात्मक क्षेत्रका सबै तहलाई समेटेको हुनुपर्छ । ब्लुमको पुरानो वर्गीकरणमा उल्लेख गरिएअनुसार संज्ञानात्मक क्षेत्रका सामर्थ्यलाई ज्ञान, बोध, प्रयोग, विश्लेषण, संश्लेषण र मूल्याङ्कन गरी ६ तहमा वर्गीकरण गरेका थिए । शैक्षिक गुणस्तर परीक्षण केन्द्रले सञ्चालन गरेका विगतका विद्यार्थी सिकाइ उपलब्धि राष्ट्रिय परीक्षण (२०११, २०१२, २०१३ र २०१५) मा उल्लिखित ६ वर्गीकरणलाई आधार मानी ज्ञान, बोध र प्रयोग र विश्लेषण, संश्लेषण र मूल्याङ्कनलाई उच्च दक्षतामा राखी चार तहका प्रश्न निर्माण गरी नतिजा पनि तदनुरूप विश्लेषण गरिँदै आएको छ । यसमा ब्लुमको परिमार्जित वर्गीकरणका ६ सम्झाइ (Remembering), बुझाइ (Understanding), प्रयोग (Applying), विश्लेषण (Analysis), मूल्याङ्कन (Evaluating) र सिर्जना (Creating) तहमध्ये सम्झना (ज्ञान), बोध (बुझाइ), प्रयोग/व्याहारिक लेखन गरी तीन तहलाई यथावत् समावेश गरी बाँकी तीन तहलाई उच्च दक्षताका रूपमा वर्गीकरण गर्ने र सोही ४ तहका परीक्षण साधन तथा प्रश्न निर्माण गर्नेगरी प्रस्ताव गरिएको छ । यिनै वर्गीकरणलाई आधार मानी सिकाइ उपलब्धिको राष्ट्रिय परीक्षणमा निम्नानुसार ४ तहका निम्नलिखित भारअनुसारका प्रश्न विकास गरिएको छ ।

कक्षा ५ को नेपालीमा संज्ञानात्मक क्षेत्रका अङ्कभार

संज्ञानको तह	**अङ्कभार**
ज्ञान (सम्झना/प्राप्ति)	२२%
बोध/एकीकरण	४४%
प्रयोग/व्यावहारिक लेखन	११%
उच्च दक्षता (तार्किक क्षमता/प्रत्यावर्तन)	२३%
जम्मा	**१००%**

प्रश्नको विकासका लागि विशिष्टीकरण तालिका

क्र. स.	भाषिक सिप	विधागत स्रोत	विषयक्षेत्र	प्रश्न प्रकृति	प्रश्नका तह	प्रश्न सङ्ख्या	पूर्णाङ्क	जम्मा पूर्णाङ्क
१.	पढाइ	आख्यानात्मक अनुच्छेद २०० शब्दसम्म	लोककथा/सामाजिक कथा/पौराणिक कथा	बहुवैकल्पिक प्रश्न	ज्ञान	२	२	६
					बोध	२	२	
				एक वाक्यमा उत्तर आउने प्रश्न	बोध	२	२	
		निबन्धात्मक अनुच्छेद २०० शब्दसम्म	सामाजिक/विज्ञान प्रविधि/शिक्षा/स्वास्थ्य/कृषि/ खेलकुद/वातावरण/प्रकृतिपरक	बहुवैकल्पिक प्रश्न	ज्ञान	२	२	६
					बोध	२	२	
				एक वाक्यमा उत्तर आउने प्रश्न	बोध	२	२	
		संवादात्मक/संस्मरण /दैनिकीसँग सम्बन्धित अनुच्छेद २०० शब्दसम्म	सामाजिक/विज्ञान प्रविधि/शिक्षा/स्वास्थ्य/कृषि/ खेलकुद/वातावरण/प्रकृतिपरक	बहुवैकल्पिक प्रश्न	ज्ञान	२	२	६
					बोध	२	२	
				एक वाक्यमा उत्तर आउने प्रश्न	बोध	२	२	
		सूचना/भित्तेपात्रो/ तालिका (कक्षा तालिका, परीक्षा तालिका, साप्ताहिक खाजा तालिका आदि)	सामाजिक/विज्ञान प्रविधि/शिक्षा /स्वास्थ्य/कृषि/खेलकुद/वातावरणसँग सम्बन्धित समसामयिक र तथ्यपरक विषयवस्तु	बहुवैकल्पिक प्रश्न	ज्ञान	२	२	६
					बोध	२	२	
				एक वाक्यमा उत्तर आउने प्रश्न	बोध	२	२	

क्र. स.	भाषिक सिप	विधागत स्रोत	विषयक्षेत्र	प्रश्न प्रकृति	प्रश्नका तह	प्रश्न सङ्ख्या	पूर्णाङ्क	जम्मा पूर्णाङ्क
२.	लेखाइ	व्यावहारिक लेखन	घरायसी चिठी र निवेदन	स्वतन्त्र रचना	प्रयोग/ व्यावहारिक सिप	१	४	४
		निर्देशित लेखन	कथा/जीवनी/संवाद	निर्देशित रचना	उच्च दक्षता	१	४	४
		स्वतन्त्र लेखन (अनुच्छेद) १०० शब्दसम्म	(क) वस्तुपरक शैली : विज्ञान प्रविधि/शिक्षा/स्वास्थ्य/कृषि/खेलकुद/ वातावरण/प्रकृति/सञ्चार **वा** (ख) आत्मपरक शैली :अनुभव/संस्मरण	स्वतन्त्र रचना	उच्च दक्षता	१	४	४
		जम्मा				**२७**	**३६**	**३६**

नोट : पठनबोधका प्रश्न विकास गर्दा बहुवैकल्पिक प्रश्न र एक वाक्यमा उत्तर आउने प्रश्नमा एकदुईओटा प्रश्न थप गर्न सकिने छ।

प्रश्नको विशिष्टीकरण (Specification of Items)

दिइएको विशिष्टिकरण तालिकामा विषयवस्तुको क्षेत्र, मापदण्ड, भार प्रतिशत, प्रश्नका सङ्ख्या र प्रकार, अङ्कको विभाजन र विभिन्न ४ स्तरमा प्रश्नको विभाजन प्रस्तुत गरिएको छ ।

कक्षा ५ को उपलब्धि परीक्षणका लागि प्रश्नको विशिष्टिकरण

विषयवस्तुको क्षेत्र (Content domain)	**भार (Weightage)**	**जम्मा पर्णाङ्क (Total Marks)**	**विभिन्न स्तरमा अङ्क विभाजन (Weightage for items of various standards)**
पढाइ	६७ %	२४	प्रत्येक स्तरको भार देहायको प्रतिशतको नजिक हुने छ । तह १ : २२% तह २ : ४४% तह ३ : ११% तह ४ : २३%
लेखाइ	३३ %	१२	
जम्मा	१०० %	३६	

तालिकामा दिइएको विभिन्न स्तरको भार प्रारम्भिक मात्र हो । वास्तविक भारको गणना विद्यार्थीको उत्तर समेतलाई आधार मानी स्तर निर्धारणसम्बन्धी विधिमध्ये कुनै एक विधि प्रयोग गरी प्रत्येक स्तरको न्यूनतम अङ्क निर्धारणबाट गर्नुपर्ने छ । माथि सुझाव गरिएको वर्गीकरण र भारले एकातिर प्रत्येक स्तरका लागि प्रश्न छनोट गर्न सहयोग गर्छ । प्रश्नपत्र विकास र छनोट गर्दा ४ ओटा स्तरका साथै संज्ञानात्मक क्षेत्रको समेत प्रतिनिधित्व हुनु आवश्यक छ ।

नमुना प्रश्न

विषय : नेपाली **कक्षा : पाँच** **समय : २ घण्टा**

१. दिइएको गद्यांश पढी सोधिएका प्रश्नको उत्तर लेख्नुहोस् :

रेसम धागो उत्पादनका लागि गरिने खेतीलाई रेसम खेती भनिन्छ । रेसम खेतीका लागि रेसम किरा पालिन्छ । रेसम धागो रेसम नामको किराको च्यालबाट बन्छ । रेसमको मुख्य आहार किम्बु मानिन्छ । किम्बु नपाइने चार ठाउँमा यो खेती गर्न कठिन हुन्छ । रेसमको जीवनचक्रमा अन्डा, लार्भा, प्युपा र वयस्क वा पुतली गरी ओटा अवस्था हुन्छन् । नेपालमा यसको अन्डा उत्पादन रेसम विकास केन्द्रले गर्छ । कृषकले त्यहींबाट अन्डा किनेर लान्छन् र उपयुक्त घर वा कोठाभित्र राख्छन् । त्यस्तो कोठा ओसिलो तर न्यानो हुनुपर्छ । अन्डाबाट १३ वा १४ दिनमा लार्भा निस्कन्छ । उक्त लार्भालाई किम्बुका पात वा डाँठ काटेर खुवाउनुपर्छ । लार्भाबाट प्युपा बन्नुअगाडि यसले मुखबाट एक प्रकारको च्याल निकाल्दै वरिपरि घुम्छ र एउटा डल्लो बनाउँछ । हावाको स्पर्श पाएपछि उक्त च्याल रेसामा परिणत हुन्छ । रेसम किरा त्यो डल्लोभित्र बसेर सुरक्षित हुन्छ । रेसम धागो निकाल्ने क्रममा उक्त डल्लो तातोपानीमा डुबाउनुपर्छ । तातोपानीमा डुबेपछि रेसम किरा मर्छ । यसपछि रेसालाई प्रशोधन गरी रेसमको धागाका रूपमा उपयोग गरिन्छ । सबैभन्दा पहिले वि.सं. २०३२ मा काभ्रे जिल्लाको खोपासीमा रेसम फार्मको स्थापना गरिएको थियो । त्यसपछि मात्र नेपालमा रेसम खेती सुरु भएको मानिन्छ । हाल नेपालका १२ जिल्लालाई रेसम खेतीको पकेट क्षेत्र मानिन्छ । तिनमा इलाम, धनकुटा, सुनसरी, धनुषा, चितवन, काठमाडौँ, काभ्रे, धादिङ, तनहुँ, कास्की, स्याङ्जा र पाल्पा जिल्ला पर्छन् । यसका अतिरिक्त रेसम खेती हुने अन्य स्थान पहिचान गरी यसलाई थप व्यावसायिक बनाउनु आवश्यक छ ।

दिइएका विकल्पमध्ये सही उत्तरमा ठिक (√) चिह्न लगाउनुहोस् :

(क) रेसमको अन्डाबाट के बन्छ ? **(१)**

(अ) पुतली (आ) लार्भा

(इ) प्युपा (ई) रेसा

(ख) रेसम किरा डल्लाभित्र किन बस्छ ? **(१)**

(अ) रेसा बनाउन (आ) अन्डा पार्न

(इ) लार्भा बनाउन (ई) सुरक्षित रहन

(ग) रेसम किराको लार्भा मर्नुको कारण के हो ? **(१)**

(अ) डल्लो तातोपानीमा डुबाइनु

(आ) किसानले रेसा निकाल्नु

(इ) डल्लो भित्र गुम्सिनु

(ई) न्यानो कोठा उपलब्ध नहुनु

(घ) धागो उत्पादन गर्ने रेसम किरा कुन अवस्थासम्म बाँच्न पाउँछ ? **(१)**

(अ) अन्डा (आ) लार्भा

(इ) प्युपा (ई) वयस्क

दिइएका प्रश्नको उत्तर लेख्नुहोस् :

(ङ) रेसम किरा किन पालिन्छ ? **(१)**

.....

(च) नेपालमा रेसम खेतीको सुरुआत कहिले भएको हो ? **(१)**

.....

(छ) रेसम पालनका लागि कस्तो कोठा उपयुक्त हुन्छ ? **(१)**

.....

२. दिइएका बुँदाका आधारमा कथा रचना गर्नुहोस् : **(४)**

- कुनै भिरमा ढुङ्गो र माटाको डल्लो मिलेर बस्नु
- माटो र ढुङ्गालाई एकअर्काबाट सहारा मिल्नु
- एक रात ठुलो पानी पर्नु
- माटाले ढुङ्गालाई समातेर र ढुङ्गाले माटालाई थिचेर राखेर दुबै जोगिनु
- यसले गर्दा दुबै जोगिन सफल हुनु
- एक पटक ती दुबैमा 'तँभन्दा म ठुलो' भन्ने घमन्ड चढ्नु र असहयोगी बन्नु
- एक दिन फेरि घनघोर वर्षा हुँदा माटालाई पानीले बगाउनु र ढुङ्गो पल्टेर फुट्नु
- घमन्डले नाश गर्ने र एकतामै बल हुने सन्देश

३. दिइएको अनुच्छेद पढी सोधिएका प्रश्नको उत्तर लेख्नुहोस् :

कुनै गाउँमा अनौठा जमिनदार थिए । उनलाई रमाउन मात्र बढी मन लाग्थ्यो । त्यहाँका कलाकार, उद्योगी, व्यापारी, प्रशासकलगायत अन्य मानिस जमिनदारलाई खुसी पार्न चाहन्थे । त्यसैले उनको घर जान सबै मानिस रहर गर्थे । जमिनदार नाच्ने, गाउने, बाजा बजाउने जस्ता कला क्षेत्रका मान्छेलाई प्रोत्साहन गर्थे । उनले समय समयमा ती मान्छेलाई घरमा बोलाउँथे र कला देखाउन लगाउँथे । त्यस वेला उनी कलाकारलाई खुब फुर्क्याउँथे । आफ्नो ५५औँ जन्मदिनका उपलक्ष्यमा उनले आफ्नो घरमा वाद्यवादन र गायनका कार्यक्रम राखे । उनले कलाकारलाई घरमा झिकाए । कलाकार पनि खुसी भएर उनका घरमा गए । गायकहरूले लोकदोहोरी, आधुनिक र पप शैलीका गीत गाए । बाजा बजाउनेले पनि मादल, मुरली, गितार, बिनायो, ड्रमसेट जस्ता बाजा बजाए । मुरली बजाउनेतिर जमिनदारले निकै ध्यान दिए । उनी त्यसका पारखी नै थिए । कलाकारहरूले प्रस्तुति गर्दा जमिनदारले उनीहरूलाई धेरै पैसा र सुन दिन्छु भन्दै अझ राम्रो गर भन्थे । कलाकारहरू अर्को प्रस्तुति गर्थे । जमिनदारले कलाकारलाई धेरै जग्गाजमिन दिन्छु,

अझ राम्रो गर भन्थे । यसरी कार्यक्रमभरि जमिनदारले कलाकारलाई हौस्याए । कार्यक्रम सकिएपछि कलाकारलाई मिठा मिठा परिकार खुवाए । हिँड्ने वेलामा कलाकारले जमिनदारलाई आफ्नो वचन पूरा गर्न अनुरोध गरे । जमिनदारले बितेका कुरा मैले बिर्सिएँ भनेर टार्न खोजे । जमिनदारको त्यस्तो व्यवहार देखेर कार्यक्रममा आएका दोहोरी गायकले फेरि गीत गाए । उनीहरूले हाँसो मजाक मात्र नगरी आफ्नो वचनमा प्रतिबद्ध हुनुपर्ने सन्देशसहितको गीत गाए । गीत सुनेपछि जमिनदार एकछिन सोच्न बाध्य भए । अन्त्यमा जमिनदारले आफ्नो वचन पूरा गरे अनि कलाकार खुसी भएर फर्किए ।

दिइएका विकल्पमध्ये सही उत्तरमा ठिक (√) चिह्न लगाउनुहोस् :

(क) जमिनदारको गाउँमा कसले प्रोत्साहन पाउँथ्यो ? **(१)**

(अ) उद्योगी (आ) व्यापारी

(इ) प्रशासक (ई) कलाकार

(ख) जमिनदारको जन्मदिनमा कुन कार्यक्रम राखिएको थियो ? **(१)**

(अ) गायन (आ) नाटक

(इ) नृत्य (ई) खेलकुद

(ग) जमिनदार कुन बाजाका पारखी थिए ? **(१)**

(अ) मुरली (आ) मादल

(इ) गितार (ई) बिनायो

(घ) जन्मदिनमा आएका कलाकारले अन्तिममा कुन गीत गाए ? **(१)**

(अ) आधुनिक (आ) दोहोरी

(इ) रक (ई) पप

दिइएका प्रश्नको उत्तर लेख्नुहोस् :

(ङ) मानिस जमिनदारको घरमा जान किन रहर गर्थे ? **(१)**

.....

.....

(च) जमिनदारलाई के गर्न मन लाग्थ्यो ? **(१)**

.....

.....

(छ) जमिनदार किन सोच्न बाध्य भए ? **(१)**

.....

४. दिपेश कक्षा ५ मा पढ्छन् । उनको कक्षामा कसैको जन्मदिन परेमा साथीहरूले जन्मदिनको शुभकामना पत्र निर्माण गरेर दिन्छन् । साथीहरूले उत्तरोत्तर प्रगति, सुस्वास्थ्य र दीर्घायुको कामना गर्छन् । यसले कक्षाका साथीहरूका बिचमा मित्रता झनै बढेर जान्छ । तपाईंले पनि आफ्नो कक्षाका मिल्ने साथीको जन्मदिन परेको अवसरमा साथीलाई दिन एउटा शुभकामनापत्र तयार पार्नुहोस् । **(४)**

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५. दिइएको संवाद पढी सोधिएका प्रश्नको उत्तर दिनुहोस् :

खेलकुद सप्ताहको तयारी

(विद्यालयमा अर्को साता खेलकुद सप्ताह हुने भएको छ । पाँच कक्षाकी कक्षा शिक्षक रमाले त्यस कक्षाबाट विभिन्न खेल र खेलाडीको अन्तिम टुङ्गो लगाउने जिम्मेवारी पाउनुभएको छ । उहाँले त्यस कक्षाका विद्यार्थी प्रतिनिधि किशोर र योगितालाई बोलाएर कुराकानी गर्दै हुनुहुन्छ ।)

रमा : नमस्कार ! मैले तपाईंहरूलाई खेलकुद सप्ताहका लागि जिम्मेवारी दिएकी थिएँ । तयारी कस्तो चल्दै छ त, हिजोअस्ति सल्लाह गरेअनुसार नै हुँदै छ नि ?

किशोर र योगिता : नमस्कार गुरुआमा !

योगिता : तयारी त राम्रै चल्दै छ तर सरिता ब्याडमिन्टन खेल्न नसक्ने भइन् । रतिया पनि दौडमा मैले राम्ररी तयारी गर्न सकिनँ भनिरहेकी छन् ।

रमा : किन, सरिता र रतियालाई के भयो र ?

योगिता : हिजो घर जाँदा सरिताको खुट्टा मर्किएछ । रतियालाई पनि पेट दुखेको छ रे । दौडन सक्दिन कि भन्दै थिइन् । उनी अभ्यास गर्न पनि आएकी छैनन् ।

रमा : अब तिनका ठाउँमा भाग लिने अरू को को छन् ?

योगिता : सरिताको सट्टा जमुनालाई ब्याडमिन्टन खेल्न लगाउनुपर्छ ? अनि रतियाको ठाउँमा चाहिँ के गर्ने के गर्ने...

रमा : अँ, केही गरौंला । (किशोरतिर हेर्दै) अनि छात्रहरूको चाहिँ के छ नि ?

किशोर : गुरुआमा, रोहित भलिबल खेल्न नपाएकामा दुःखी छन् ।

रमा : ए हो र ! (मुसुक्क मुस्कुराउँदै) तपाईंहरू अहिले सानै हुनुहुन्छ । माध्यमिक तहका दाजुदिदी तपाईंहरूभन्दा ठुला हुनुहुन्छ । ठुला विद्यार्थीसँग त्यस्ता खेल खेल्दा लड्ने, घाइते हुने डर हुन्छ । त्यसैले त खेल सप्ताहमा विभिन्न खेल र त्यसमा भाग लिन पाउने विद्यार्थीको तह छुट्याइएको

हो नि ! भलिबल माथिल्लो कक्षाका लागि मात्र छुट्याइएको छ । अनि बाँकी अरू त ठिक छ नि ?

किशोर : अरू त लगभग ठिकै छ गुरुआमा । त्यसो गर्दा अब हाम्रो कक्षाबाट ब्याडमिन्टनमा सुयोग र जमुना, डोरी नाघ्नेमा जमुना, पाल्देन र खड्ग, टेबुलटेनिसमा विनिता र म, गणित दौडमा रेखा र रमिता सहभागी हुने टुङ्गो भयो । दौडमा चाहिँ कृष्ण र शोभाले तयारी गरेका छन् । रतियाको ठाउँमा बस्ने कोही एक जना छनोट गर्दा दौडका सहभागी पूरा हुन्छन् ।

रमा : त्यसो भए रतियाका सट्टा रोहितलाई तयारी गर्न लगाऔँ न त । अरू बाँकी किशोरले भनेअनुसार नै गरौँ है त ?

सबै जना : हुन्छ गुरुआमा, हामी हजुरले भनेअनुसार नै गर्छौं ।

रमा : ल, तयारी राम्रोसँग गर्नुहोस् । केही अप्ठेरो परे मलाई भन्नुहोस् है त ।

सबै जना : धन्यवाद, गुरुआमा !

दिइएका विकल्पमध्ये सही उत्तरमा ठिक (√) चिह्न लगाउनुहोस् :

(क) एकभन्दा बढी खेलमा सहभागी भएको विद्यार्थी को हो ? **(१)**

(अ) किशोर (आ) सुयोग

(इ) जमुना (ई) पाल्देन

(ख) जमुनाले किन खेल्ने अवसर पाउने अवस्था आयो ? **(१)**

(अ) खेल्न नपाएर दुःखी भएकाले

(आ) खेल्नका लागि उत्सुक भएकाले

(इ) सरिताको खुट्टा मर्किएकाले

(ई) रतियाको पेट दुखेकाले

(ग) खेल्न नपाएर दुःखी हुने विद्यार्थी को हो ? **(१)**

(अ) रेखा (आ) रोहित

(इ) रमिता (ई) पाल्देन

(घ) पाँच कक्षाका विद्यार्थी सहभागी नभएको खेल कुन हो ? **(१)**

(अ) टेबुलटेनिस (आ) दौड

(इ) गणित दौड (ई) भलिबल

दिइएका प्रश्नको उत्तर लेख्नुहोस् :

(ङ) रतियाले ब्याडमिन्टन अभ्यास गर्न नपाउनुको कारण के हो ? **(१)**

.....

(च) खेलकुदका लागि विद्यार्थीको तह किन छुट्याइएको हो ? **(१)**

.....

(छ) टेबुलटेनिसमा सहभागी हुने खेलाडी को को हुन् ? **(१)**

.....

६. 'सरसफाइको महत्त्व' शीर्षकमा १०० शब्दमा नघटाई एक अनुच्छेद लेख्नुहोस् । **(४)**

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.....

७. दिइएको भित्तेपात्रो पढी सोधिएका प्रश्नको उत्तर लेख्नुहोस् :

फागुन २०८१ नेपाल संवत् ११४५ FEBRUARY-MARCH 2025

आइतबार SUNDAY	सोमबार MONDAY	मङ्गलबार TUESDAY	बुधबार WEDNESDAY	बिहीबार THURSDAY	शुक्रबार FRIDAY	शनिबार SATURDAY
				फाल्गुन कृष्ण परेवा १ 13	द्वितीया २ 14	तृतीया ३ 15
चतुर्थी ४ 16	पञ्चमी ५ 17	षष्ठी ६ 18	सप्तमी ७ 19 प्रजातन्त्र दिवस	सप्तमी ८ 20	अष्टमी ९ 21	नवमी १० 22
दशमी ११ 23	एकादशी १२ 24	द्वादशी १३ 25	त्रयोदशी १४ 26 महाशिवरात्री	चतुर्दशी १५ 27	औंसी १६ 28 ग्याल्पो ल्होसार	द्वितीया १७ 1
तृतीया १८ 2	चतुर्थी १९ 3	पञ्चमी २० 4	षष्ठी २१ 5	सप्तमी २२ 6	अष्टमी २३ 7	नवमी २४ 8 अन्तर्राष्ट्रिय नारी दिवस
दशमी २५ 9	एकादशी २६ 10	द्वादशी २७ 11	त्रयोदशी २८ 12	चतुर्दशी २९ 13 पहाडी जिल्ला होली		

दिइएका विकल्पमध्ये सही उत्तरमा ठिक (√) चिह्न लगाउनुहोस् :

(क) माथिको क्यालेन्डरअनुसार कतिओटा शनिवार परेका छन् ? **(१)**

(अ) ४ (आ) ५

(इ) ६ (ई) ७

(ख) यो महिनामा सबैभन्दा धेरै कुन वार परेको छ ? **(१)**

(अ) सोमवार (आ) मङ्गलवार

(इ) बुधवार (ई) बिहीवार

(ग) महाशिवरात्रि कहिले परेको छ ? **(१)**

(अ) फागुन १४ गते (आ) फागुन १५ गते

(इ) फागुन १६ गते (ई) फागुन १७ गते

(घ) माथिको भित्तेपात्रोअनुसार १६ गते कुन पर्व परेको छ ? **(१)**

(अ) महाशिवरात्रि (आ) होली

(इ) एकादशी (ई) ग्याल्पो ल्होसार

दिइएका प्रश्नको उत्तर लेख्नुहोस् :

(ङ) २०८१ साल चैत १ गते कुन वार पर्छ ? **(१)**

.....

(च) माथिको क्यालेन्डरअनुसार १७ गते कति तारिख परेको छ ? **(१)**

.....

(छ) वि.सं. अनुसार माथिको क्यालेन्डरमा उल्लेख भएको साल र महिना लेख्नुहोस् । **(१)**

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2.2 Assessment Framework for English

Introduction

English is taught as a compulsory subject at the school level in Nepal. Moreover, it has also been used as a medium of instruction in some academic institutions. Hence, it is necessary to ensure the effective learning of the language. To assess the mastery of the language, an effective assessment is pivotal. Besides testing individual performance, a national-level assessment is also essential to identify Nepali students' average proficiency in English. For this purpose, the Education Review Office (ERO) conducts the National Assessment of Student Achievement (NASA).

The Education Review Office (ERO) has developed a framework as a comprehensive guideline for conducting NASA systematically. Hence, this framework has been designed to assess the curricular competencies of the English subject of Grade 5 on the basis of the Basic Education Curriculum, 2078 (Grades 4 and 5). While developing this framework, a thorough analysis of curricular competencies and the expected learning outcomes of Grade 5 has been done. This framework defines standards and criteria for assessing reading and writing skills, analyzing the curricular contents and domains. It outlines four standards for reading and writing skills: Below Basic, Basic, Proficient and Advanced, which can also be interpreted as Level 1, Level 2, Level 3, and Level 4, respectively. It also outlines various levels of the cognitive domain to be performed by the students and suggests a test blueprint, i.e., a specification table for item construction.

Content Domain Identification

The Basic Education Curriculum (Grades 4 and 5), (2078) of English emphasizes four language skills, viz. listening, speaking, reading, and writing. To ensure the learning of these skills, students are expected to achieve the following competencies after the completion of Grade 5:

1. Listen and respond to familiar everyday expressions in English.

2. Comprehend and follow slowly and carefully articulated simple speeches on familiar topics.

3. Communicate ideas, opinions and emotions orally in various personal and local situations.

4. Respond to basic language functions.

5. Read varieties of simple texts on familiar topics for understanding and pleasure.

6. Show good control over basic vocabulary.

7.Write short and simple sentences to create a text.

8.Be familiar with English sounds and their structures.

9. Show an understanding of basic English grammar.

The aforementioned curricular competencies are general. To make them more specific, the curriculum has identified the learning outcomes of each skill for grades 4 and 5. Since NASA focuses on reading and writing skills only, the framework deals with the learning outcomes of the respective language skills (CDC, 2078).

S.N.	Skills	Grade Five
1.	Reading	1. Retrieve specific information from short, simple texts. 2. Get an idea of the content of simple informational materials with or without the help of visual support. 3. Read and follow short and simple written directions on how to get from one place to another. 4. Read and retrieve information from short factual texts with or without the help of pictures. 5. Read and understand simple stories. 6. Make simple inferences from reading materials. 7. Read and understand simple poems. 8. Guess the meaning of unfamiliar words from contexts. 9. Consult an English dictionary to look for the meaning.
2.	Writing	1. Copy out short texts presented in standard printed format. 2. Use simple words and phrases to describe objects of everyday use. 3. Write short and simple sentences about likes and dislikes, family, school activities and free time activities. 4. Write simple paragraphs about themselves and on familiar topics. 5. Write short simple postcards, messages, notes, and letters/emails. 6. Write date, name, nationality, address, age and date of birth on a registration form. 7. Link words or sentences with basic connectors (and, but, because, so). 8. Write about pictures and familiar topics using simple phrases and sentences. 9. Describe people, places and things. 10. Use basic punctuation marks correctly. 11. Write short creative stories (completion and ordering). 12. Write simple poems and stories.

The specification grid has suggested that the following cognitive levels should be incorporated in reading tests. They are described as follows: (CDC, 2078).

a. Literal Comprehension (LC): It is the basic level of reading competency in which students are required to recognize the information explicitly stated in the text. The test item under literal comprehension assesses the students' ability to recognize facts, figures, vocabulary, dates, times, locations, etc.

b. Reorganization (R): It is the competence level just beyond literal comprehension. Students construct the meaning relating to two or more pieces of information explicitly stated in the text.

c. Inference (I): It is the level at which students are required to deduce the implied meaning based on their prior knowledge, intuition, and the ideas or clues given in the text.

Criteria and Standards

NASA has set specific criteria and standards for assessing reading and writing skills. To examine students performance in those skills, following standards will be used as supportive bases.

A. Reading

Literature on assessment regarding standards and levels does not show any uniformity; however, many of them suggest three to six or even more standards.

The Programme for International Student Assessment, PISA (OECD,2023) categorizes reading proficiency into seven levels, from Below Level 1b to Level 6. Each level delineates a specific range of skills:

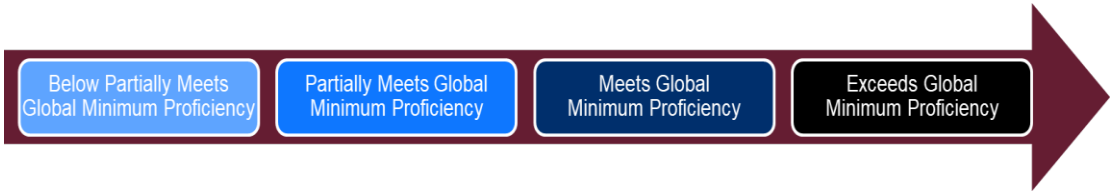
- Below Level 1b: basic text comprehension;
- Level 1b and Level 1a: locate explicit information, recognize main ideas;
- Level 2: integrate text components and understand relationships;
- Level 3: infer information, interpret texts;
- Level 4: handle complex tasks, integrate multiple sources, and
- Level 5 and Level 6: manage, evaluate, and critically analyze large amounts of complex information

The Progress in International Reading Literacy Study (PIRLS) assesses fourth graders' reading comprehension based on two key areas: literary experience and informational reading. It categorizes comprehension into four processes: retrieving information, making inferences, interpreting content, and evaluating text. Performance is benchmarked at four levels: Low, Intermediate, High, and Advanced.

The Common European Framework of Reference for Languages (CEFR) outlines six levels of proficiency for reading and writing:

- A1: Can understand and use familiar everyday expressions, write simple phrases and sentences about oneself;
- A2: Can read and write short, simple texts on familiar topics;
- B1: Can understand the main points of clear texts, write simple connected texts on topics of personal interest;
- B2: Can read articles, reports, and write detailed texts clearly expressing viewpoints;
- C1: Can understand demanding texts, produce clear, well-structured, detailed texts on complex subjects; and
- C2: Can read virtually all forms of written language easily, write accurately and effectively at an advanced level.

The Global Proficiency Framework (GPF) (UNESCO, 2020) for Reading defines the global minimum proficiency levels that learners are expected to demonstrate at the end of each grade level, from grades one to nine. The GPF for Reading defines important reading-related knowledge and skills learners should develop in primary and lower secondary school. It also describes the minimum proficiency levels learners are expected to demonstrate. GPF outlines the four Global Proficiency Levels (GPLs) and provides a brief and general definition of each. These levels are:



(Source: UNESCO, GPF, 2020)

The above-mentioned levels have been defined in the table below.

Global Minimum Proficiency Levels	**Definitions**
Below Partially Meets Global Minimum Proficiency	Learners lack the most basic knowledge and skills. As a result, they cannot complete the most basic grade-level tasks.
Partially Meets Global Minimum Proficiency	Learners have limited knowledge and skills. As a result, they can partially complete basic grade-level tasks.
Meets Global Minimum Proficiency	Learners have developed sufficient knowledge and skills. As a result, they can successfully complete the most basic grade-level tasks.
Exceeds Global Minimum Proficiency	Learners have developed superior knowledge and skills. As a result, they can complete complex grade-level tasks.

GPF has clearly stated the following cognitive process and the sub-cognitive process of reading comprehension for assessing reading for Grade 5.

Cognitive process	Sub-cognitive process
R1: Retrieve information at the word level	R1.1: Recognize the meaning of common grade-level words R1.2: Retrieve explicit information in a grade-level text by direct- or close-word matching R1.3: Retrieve explicit information in a grade-level text by synonymous word matching
R2: Interpret information	R2.1: Identify the meaning of unknown words and expressions in a grade-level text R2.2: Make inferences in a grade-level text R2.3: Identify the main and secondary ideas in a grade-level text
R3: Reflect on information	R3.1: Identify the purpose and audience of a text R3.2: Evaluate a text with justification

Similarly, the NASA Framework 2020 for Grade 5 has defined the standards in four different levels: Below Basic, Basic, Proficient and Advanced.

While developing this framework, several assessment frameworks, including the ones stated above, were consulted, considering the reading constructs prescribed in the curriculum.

The criteria and standards for NASA 2025 for English, Grade 5, have been elaborated in the following table:

Levels of Standards	General Descriptors	Assessment Criteria
Level 1 (Below Basic)	Students demonstrate the **most basic/ prerequisite** knowledge and skills needed for comprehending the grade-level text.	**L1.1** Retrieve a single piece of explicit information from a grade 5-level text by direct or close-word matchings when the information required is adjacent to the matched word and there is limited competing information. **L1.2** Retrieve a single piece of explicit information from a grade 5-level text by direct- or close-word matching when the information required is nearby but not adjacent to the matched word and there is competing information.

Levels of Standards	General Descriptors	Assessment Criteria
Level 2 **(Basic)**	Students demonstrate **basic** knowledge and skills outlined in the curriculum required for comprehending the text.	**L2.1** Retrieve a single piece of explicit information from a grade 5-level text by synonymous word matching when there is limited competing information. **L2.2** Retrieve a single piece of explicit information from a grade 5-level text by synonymous word matching when the information required is not prominent and there is competing information.
Level 3 (**Proficient**)	Students demonstrate **minimum** understanding of the knowledge and skills outlined in the curriculum and demonstrate **required proficiency** in interpreting the text based on explicit information.	**L3.1** Relate two or more explicit pieces of information in a grade 5-level text from consecutive sentences when there is no competing information. **L3.2** Relate two or more explicit pieces of information in a grade 5-level text from one or more paragraphs but not in consecutive sentences, when there is limited/ a lot of competing information.
Level 4 **(Advance)**	Students demonstrate **advanced** ability to infer the implicit information from the grade-level text.	**L4.1** Make inferences in a grade 5-level text by relating two or more pieces of implicit information showing a causal relationship. **L4.2** Make inferences by comparing (characters, ideas, etc.) in a grade 5-level text by relating two or more pieces of implicit information. **L4.3** Identify the sequence of events/ actions/ steps in a grade 5-level text when the sequence has to be inferred (e.g., a step is not explicitly stated) and there is competing information, such as overlapping timelines.

The four cognitive processes will be considered while developing reading comprehension items. Test takers will engage themselves with the following cognitive processes, as shown in the table given below:

Level	Cognitive processes	Weightage
1 and 2	Literal comprehension	About 60%
3	Reorganization	About 20%
4	Inference	About 20%

Stimuli for reading comprehension assessment

This assessment will be solely based on the texts not included in the existing English textbooks. The length of such texts should not exceed 150 words. These stimuli should be taken from different contexts as shown in the table below.

Context	Elaboration
Personal (Individual focus)	Reading texts are related to personal context, like the text about oneself, one's family, story, personal letter, etc.
Local (Community focus)	Reading texts are related to day-to-day situations and activities related to home, school, local community and the country. For example, a school timetable, or a description of one's hometown or the country.
Global (External focus)	Reading texts are related to broader situations that may affect whole communities or countries, or have an even wider, global relevance, e.g., essays, charts, notices, etc.

Selection of stimulus

While selecting a stimulus, sentence length, words per sentence, and level of vocabulary will be taken into consideration to maintain the level of complexity. Besides, while choosing the stimulus for testing reading, the following questions should be considered.

- Is it appropriate in content and relevant to students' grade level?
- Is the text not likely to be encountered by the test takers? (For example, it should not be from a textbook or other frequently-used teaching resources.)
- Is it authentic (not developed for testing and should the source of the text be mentioned?
- Is it factually accurate?
- Is it grammatically correct?
- Is it appropriate in terms of socio-cultural context?
- Is it gender-sensitive (not giving privilege to any gender)?

- Is it fair (equally accessible for students from all backgrounds)?
- Is it modified to construct items (should not add and/or delete ideas to make test items)?
- Is it complete in meaning (it should contain all the essential ideas)?
- Is it appropriately illustrated (when charts, diagrams, or other para-orthographic texts are incorporated)?

Tasks types

This framework suggests the use of both Constructed Response (CR) and Selected Response (SR) items while assessing reading comprehension skills. Constructed response items include short answer questions (SAQs) and selected response items include Multiple Choice Questions (MCQs). Under each reading text, at least six questions will be asked, including both types in equal proportion as far as possible.

B. Writing

Students' writing skills will be assessed based on the following learning outcomes:

1. Use simple words and phrases to describe objects of everyday use.
2. Write short and simple sentences about likes and dislikes, family, school activities and free time activities.
3. Write simple paragraphs about themselves and on familiar topics.
4. Write short, simple postcards, messages, notes, and letters/emails.
5. Write about pictures and familiar topics using simple phrases and sentences.
6. Describe people, places, and things.

The test takers will be placed into four levels based on their performance in writing. The following constructs will be assessed under each writing task.

1. Subject matter: Assessing the subject matter in writing involves assessing the ideas/content per the prompts. It also involves the depth, relevance, accuracy, and originality of the content.

2. Organization: Organization in writing involves the assessment of an effective and logical flow of ideas and supporting details such as statistics, anecdotes, facts, examples, and reasons.

3. Coherence and cohesion: Coherence and cohesion in writing involve a well-coordinated balance between logical progression of ideas and smooth connections between sentences and paragraphs. Both coherence and cohesion in writing are assessed to check the overall clarity and readability of the written text for effective communication.

4. **Appropriateness and correctness of language**: Assessment of appropriateness and correctness of language involves the assessment of grammar, mechanics, tone, and cultural sensitivity.

5. **Range of vocabulary:** Assessing the range of vocabulary in writing involves assessing the use of a wide variety of words, different registers and styles, precision and clarity, usage of idiomatic expressions, synonyms, and antonyms as demanded by the question prompt.

6. **Layout:** Assessing the layout in writing involves different types of writing, such as paragraphs, essays, and letters, examining how the text is visually presented on the page as demanded by the question prompt.

Based on the following level-wise descriptors, a group of raters will award each test taker a certain level. Detailed descriptors for each level have been given in the following table:

Levels of Standard	**Descriptors**
4 (Advance)	• Ideas presented on the topic have appropriate supporting details as demanded by the question prompt, with some elaboration and originality • Ideas are coherently organized using appropriate cohesive devices and transitions. • Appropriate use of a wide range of vocabulary and sentence structures • Good control of simple grammatical structures, with an attempt to use some complex grammatical structures, with very few errors in the mechanics of writing • Complete and appropriate match between the text type, the writing format, and the word limit
3 (Proficient)	• Ideas presented on the topic have some elaboration • Ideas are often incoherently organized, though noticeable use of simple cohesive devices is being used • Attempts made to use a range of vocabulary with few errors, though these do not impede meaning • Attempts were made to use some complex structures with frequent errors, but a few errors were noticed while using simple grammatical structures and/or in punctuation and spelling; however, errors do not impede communication • Complete and appropriate match between the text type and the writing format • A close match with the expected word limit
2	• Ideas often written in points without elaboration

(Basic)	• Ideas haphazardly organized with rare use of cohesive devices • Limited use of vocabulary with some errors that do not impede meaning • Few errors while using simple grammatical structures but frequent errors occur in punctuation and spelling without impeding communication • Partial match between the text type and the writing format • High mismatch with the expected word limit
1 (Below-basic)	• Ideas not relevant to the topic • Ideas haphazardly organized with no use of cohesive devices • Repetition of vocabulary • No control of simple grammatical structures, and, multiple errors in punctuation/spelling which impede understanding in most of the text • Inappropriate format and layout • Extensive mismatch with the expected word limit

Test Blueprint

Each test booklet contains the items as prescribed in the table given.

Content domain	Weightage	Items in each set	Weightage for items of various standards
Reading	60%	4 stimuli (reading texts), including at least 24 comprehension questions *Each test booklet should contain:* • *a story* • *a letter* • *an essay, and* • *a notice or a non-continuous text (timetable, schedule, menu, chart and calendar)* *Note: The scoring of the reading comprehension items will be dichotomous, i.e. either 1 or 0.*	The distribution of questions in each set should include the cognitive levels as mentioned below: • Level 1 and 2: About 60% • Level 3: About 20% • Level 4: About 20%

Content domain	Weightage	Items in each set	Weightage for items of various standards
Writing	40%	2 tasks *Note: Students' score ranges from 0 to 4. This score is understood as the level of students' writing performance.*	The writing tasks in each set should include any two from: • Descriptive (a paragraph describing a picture/place/thing) • Transactional (personal letter/ personal email/ leave application)

Model Question

Class: 5 **Subject: English**

R1. Read the text and do the tasks. **(8 × 1 = 8)**

Hi! My name is Ram and I am ten years old. I live in a small town with my parents and my little sister Rita. My house is near a beautiful park. I love to play football with my friends in the park. I study at ABC School in grade five. It has tall trees, colorful flowers and a big playground.
My favorite hobbies are reading books and watching television. I enjoy reading stories about brave people. On Saturdays, I watch my favourite television programmes and play football. I also like to help my parents in the kitchen.
My favorite subject is Mathematics because I enjoy solving tricky puzzles. I become really happy when I am able to solve tricky problems. I want to be a teacher to support young children. For this, I work hard in school these days. I focus on subjects like Science and Mathematics. I know they will help me to be a teacher in the future.

Circle (O) the letters with the correct answers.

1. What does Ram love to read about?

A. Young children

B. Beautiful park

C. Brave people

D. Colorful flowers

2. What does Ram do on Saturdays?

A. Read stories

B. Watch TV programs

C. Solve tricky problems

D. Focus on Science and Math

3. What does Ram like to do in the kitchen?

A. Help parents

B. Read books

C. Watch Television

D. Play with friends

4. Why does Ram want to become a teacher?

A. He loves to work hard.

B. He wants to support young children.

C. He reads mathematics and science.

D. He wants to solve tricky problems.

Answer these questions.

5. With whom does Ram live?

……

6. Write two things that ABC school has.

……

7. What is Ram's aim for his future?

……

8. Which subjects help Ram to be a teacher?

……

R2. Read the story and do the tasks. **(8 × 1 = 8)**

"Look, mom! See what a pretty fish: a little trout," said John to his mother. John's mother asked, "Where did you get it, John?" "Tom, my best friend, caught it in the river. I went to the river to splash in the water and I saw this little fish. Then, I told Tom about the fish, and he ran home to get his fishing rod. He put the rod into the water and caught the fish, and I put it into this bucket." "Well, what will you do with it?" asked John's mother. "I will keep it, mom," replied John. "But, my boy, it will not live in that bucket. You should put it back into the river," replied his mother. John became sad. "I wish I could keep it. It is so pretty! May I put it either into our warm water tank or into the pond?" "No, John," said his Mom. The trout needs to go back to its home: the clear, cold river.

Circle (O) the letters with the correct answers.

9. How was the trout?

A. Pretty

B. Clear

C. Cold

D. Warm

10. Where did John find the fish?

A. In the bucket

B. In the pond

C. In the river

D. In the tank

11. Why did Tom run his home?

A. To catch the fish.

B. To get his fishing rod.

C. To put the fish into the pond.

D. To put the fish back into the river.

12. What made John sad?

A. Tom's help

B. Cold water of the river

C. Warm water of the tank

D. Mother's suggestion

Answer these questions.

13. Who is John's best friend?

……

14. Why did John go to the river?

……

15. What did John do after he saw the fish?

……

16. Where does a trout live?

…….....

17. Look at the picture and describe what you see and what the people are doing in about 40-60 words. (4)

.....
.....
.....
.....

R3. Read the letter and do the tasks. **(8 × 1 = 8)**

Kirtipur, Kathmandu
11th March, 2025

Dear Manushi,
I was so happy to hear from my mother that you are back home after the tour. Hope you had a safe and enjoyable tour. I have been waiting to hear all about the tour from you.
This was the first time you have been to Thailand. So, I guess everything on the tour was exciting. I have heard that the place is very beautiful and that the people there are friendly. But I was worried when I knew that there was heavy rainfall during your stay there. Hope all of you were safe there. I hope everything else was fine except for this.
I had spoken to your mother earlier. She told me that you would be coming home after two weeks. I saw your pictures on Facebook as well. I can't wait to meet you and hear all your stories. Waiting eagerly for your reply.

Your loving friend,
Sarita

Circle (O) the letters with the correct answers.

18. According to Sarita, how are the people of Thailand?

A. Beautiful

B. Exciting

C. Worried

D. Friendly

19. What has Sarita been waiting for?

A. Having an enjoyable tour.

B. Seeing Manushi's Facebook pictures.

C. Hearing all about Manushi's tour.

D. Speaking to Manushi's mother.

20. Why does Sarita guess that the tour was interesting?

A. It was Manushi's first visit to Thailand.

B. There was heavy rainfall in Thailand.

C. Manushi is back home after the tour.

D. Manushi posted her pictures on Facebook.

21. Who wrote this letter?

A. Manushi

B. Sarita

C. Manushi's mother

D. Sarita's mother

Answer these questions.

22. Who told Sarita that Manushi was back home from the tour?

……..

23. How many times has Manushi visited Thailand?

……

24. Why did Sarita hope that Manushi was safe in Thailand?

……..

25. When would Manushi come home from the tour?

……

R4. Read the menu and do the tasks. **(8 × 1 = 8)**

Hotel Delight Corner **Kirtipur, Kathmandu** ***Feel Like Home***			
Hot Drinks			
S.N.	**Items**	**Quantity**	**Price**
1.	Black tea	Per cup	Rs. 30
2.	Milk tea	Per cup	Rs. 50
3.	Coffee	Per cup	Rs. 150
Cold Drinks			
S.N.	**Items**	**Quantity**	**Price**
1.	Coke, Fanta, Sprite	500ml	Rs. 60
2.	Mineral water	1 liter	Rs. 30
Rice			
S.N.	**Items**	**Quantity**	**Price**
1.	Jeera Rice	Per plate	Rs. 120
2.	Egg Fried Rice	Per plate	Rs. 150
3.	Chicken Fried Rice	Per plate	Rs. 170
Momo			
S.N.	**Items**	**Quantity**	**Price**
1.	Veg. Momo	Per plate	Rs. 100
2.	Chicken Momo	Per plate	Rs. 130
3.	Buff Momo	Per plate	Rs. 110
4.	Mutton Momo	Per plate	Rs. 150
20% discount for children below 14 years and 10% discount for all on Saturdays.			

Circle (O) the letters with the correct answers.

26. What is the price of a cup of milk tea?

A. Rs. 60 B. Rs. 50

C. Rs. 30 D. Rs. 150

27. Which of the following two items have equal price?

A. Black tea and coffee

B. Black tea and coke

C. Black tea and milk tea

D. Black tea and mineral water

28. How many items of rice are available in the hotel?

A. One

B. Two

C. Three

D. Four

29. Which of the following is the cheapest momo?

A. Veg

B. Chicken

C. Buff

D. Mutton

30. Where is the hotel located?

……..

31. How much sprite can we buy in Rs. 60?

……...

32. What is the price of one plate egg fried rice?

……..

33. Who gets 20% discount in the hotel?

……..

34. Today is your birthday. You have a birthday party at home. Now, write a letter to your friend inviting him or her to attend the party. Write who will be there, what foods you will eat, what games you will play and what other things you will do at the party. Write in 40 - 60 words.

(4)

2.3 Assessment Framework for Mathematics

Introduction

National Assessment of Student Achievement (NASA) is designed to assess student achievement based on curricular competencies. National Curriculum Framework (NCF) 2076 (B.S.) mentions that students in grades 4-5 will have the competencies of fundamental mathematical concepts, skills, and their application in daily life activities. NASA, 2025 for grade 5 will assess the curricular competencies based on the grade 5 Mathematics curriculum, 2078 (B.S.).

This assessment framework for the Mathematics subject is prepared to provide guidelines for developing test items for assessing students' achievement. Working with experts and teachers, the curricular competencies of grade 5 is analyzed and developed criteria and performance standards in the Mathematics subject for NASA, 2025. This assessment framework includes a description of content domains of Mathematics with competencies, assessment criteria, and standards, and cognitive domains for assessment. It also presents a test blueprint or a table of specifications for test construction.

Content Domain Identification

Mathematical knowledge and skills assist individuals in effectively utilizing tools and resources applicable to daily life. NCF, 2076 (BS) focuses on mathematical literacy that comprises numeracy and number concepts, behavioral mathematical concepts, behavioral skills development and applications of knowledge and skills to solve the behavioral problems of daily life. Likewise, the Basic Level Curriculum (Grade 4-5) of Mathematics at the school level aims to cultivate mathematical knowledge, skills, attitudes, and competencies in students for enabling them to contextualize advancements and innovations in knowledge, science, and technology (CDC, 2078 BS).

The mathematics curriculum emphasizes the development of critical and logical thinking skills, the ability to apply mathematical concepts to solve real-life problems, and the acquisition of foundational mathematical knowledge and skills that are prerequisites in higher grades. To achieve these competencies, the grade five curriculum includes five major content areas: Geometry, Arithmetic, Measurement, Statistics, and Algebra. Geometry contains lines and angles, and solid objects. Arithmetic contains number concepts, simplification using fundamental operations of mathematics, and fractions, decimals, and percentages. Similarly, Measurement contains time, money, distance, capacity, weight, perimeter, area, and volume. Statistics contain bills and budgets, data, and bar graphs. Algebra contains algebraic expressions and equations.

The Basic Level Curriculum (Grade 4-5), 2078 (BS) of Mathematics has listed the following expected competencies:

1. Measurement and construction of lines and angles, and identification of different parts of solid objects.
2. Counting and application of Devanagari and Hindu-Arabic number systems up to Crores.
3. Solution of daily life mathematical problems, including addition, subtraction, multiplication, and division.
4. Solution of simple behavioural problems related to fractions, decimals, and percentages.
5. Solution of daily life problems related to measurement.
6. Construction and sharing the information based on table and figures.
7. Solution of simple problems related to algebraic expression and equations.

There are 30 learning outcomes in the grade 5 mathematics curriculum in five content domains. The content domain with learning outcomes for Mathematics in grade 5 and their weightage drawn from the curriculum are presented in the table below.

Content Domain	Learning Outcomes	Working hours	Weightage (Percentage)
Geometry	• To measure and construct the angles from 0° to 180° by using a protractor. • To measure the interior angles of a given triangle and a quadrilateral. • To distinguish right angle, obtuse angle and acute angle. • To construct the perpendicular line and parallel line on a square grid. • To count the number of vertices, edges and surfaces of cube and cuboid.	25	16
Arithmetic	• To present the numbers in place value table (National and international system), read and write the numbers in Devanagari Hindu Arabic Numeration System up to 9 digits. • Rounding off the five digit numbers to the nearest hundred and thousand. • To identify prime and composite numbers from 1 to 100. • To solve the daily life problems including any three operations among addition, subtraction, multiplication and division. • To convert the improper fractions and mixed numbers into each other. • To add and subtract like fraction (up to three).	60	38

Content Domain	Learning Outcomes	Working hours	Weightage (Percentage)
	• To convert fractions and decimals into each other. • To add and subtract the decimal numbers. • To convert the fraction and percentage into each other. • To convert the decimal and percentage into each other.		
Measurement	• To express the time on 12 hours and 24 hours' system. • To solve the problems on multiplication and division related to time (year and month, week and days, month and days, day and hour and hours and minutes) • To solve the problems related to multiplication and division of millimeter and centimeter, centimeter and meter, meter and kilometer. • To solve the problems related to multiplication and division of milliliter and liter. • To solve the problems related to multiplication and division related to gram, kilogram and quintal. • To calculate the perimeters of rectangular and square surfaces based on length and width. • To calculate the volume of given cube and cuboid.	35	22
Statistics	• To prepare the bills. • To prepare the budget of a family. • To present the given or collected data in a table • To make bar graph using square grid.	15	9
Algebra	• To introduce of algebraic term and expression. • To distinguish like terms and unlike terms • To add and subtract the like terms. • To solve the linear equation with one variable using equality axiom.	25	15
Total		**160**	**100**

Cognitive Domain

Bloom's taxonomy has been used as a guide for designing assessment framework. According to revised Bloom's taxonomy six levels of cognitive learning are remembering, understanding, applying, analyzing, evaluating and creating (Anderson & Krathwohl, 2001). The different levels of taxonomy of the cognitive domain are used in developing and selecting test items. Under four levels of proficiency standards, we should check and ensure the representation of various levels of the cognitive domain. Among the six levels of taxonomy, the first three levels, remembering, understanding and applying are considered separately and the last three levels, analyzing, evaluating and creating, are combined as reasoning.

According to Anderson and Krathwohl (2001), remembering involves the retrieval of previously acquired information, which encompasses the recall of facts, lists, terminology, fundamental concepts and definitions. Understanding reflects a comprehension of facts and ideas through various cognitive activities such as comparing, interpreting, exemplifying, classifying, summarizing, inferring, describing and articulating main concepts. The applying phase entails the utilization of learned concepts, facts, techniques and rules to address new problems in a novel context. In this level, students can use psychomotor skills to solve mathematical problems such as the construction of an angle using a protractor or compass, etc. Furthermore, reasoning extends beyond the resolution of routine problems; it encompasses the ability to navigate unfamiliar situations and complex contexts while addressing multi-step problems that require the integration of multiple relationships and contexts (IEA, 2015).

The assessment is also confined to measuring the cognitive skills of the students. While developing and selecting items, various levels of cognitive domains should be taken into consideration. The levels of the cognitive domain in this framework are adopted from revised Bloom's taxonomy (Anderson & Krathwohl, 2001). The cognitive domain for NASA 2025 for Grade 5 mathematics is structured in four levels of the cognitive domain (Knowledge, Understanding, Application, and Higher Ability) based on the domains of the national curriculum. So, the assessment should ensure the representation of the items from remembering (knowledge), understanding, applying and reasoning (higher ability) according to the proportion given in the table below:

Cognitive Domain	**Weightage**
Knowledge	16%
Understanding	24%
Applying	40%
Higher ability	20%
	100%

Criterion and Standards

Criteria in the process of assessment refer to specific aspects or competencies used to judge students' achievement. Such criteria are determined on the basis of learning objectives from specific courses that students are expected to learn. For each criterion, the standards are developed to identify the level of student achievement. The standards represent the established levels or benchmarks of proficiency based on the criteria to be measured (Cizek, 2012). The established standards within each evaluation criterion delineate distinct levels of competency. Consequently, these standards serve as benchmarks for assessing the extent to which students exhibit these competencies.

The criteria for the national assessment of Grade 5 in Mathematics are developed based on the national curriculum of Mathematics for Grade 5. It outlines 27 criteria for evaluating student performance. Based on the different literature and previously developed NASA framework, each criterion is further subdivided into four distinct standards, these standards are in hierarchical form reflecting varying degrees of knowledge, skills and competencies (NASA assessment framework grade 5, 2017). For NASA 2025, four standards have been defined for each criterion; these four standards are: below-basic, basic, proficient and advanced.

General Standards

NASA 2017 for Grade 5 adopted four levels of standard: pre-basic, basic, proficient and advanced. The pre-basic level students can respond to questions involving an easy-to-understand context where all the information needed is given in a simple form. The students of this level partially demonstrate basic pre-requisite knowledge and skills needed for the grade 5 curriculum. The basic level students can demonstrate essential pre-requisite knowledge and skills specified by the curriculum, but have low mastery of the contents of the grade 5 curriculum. The proficient level student demonstrates proficiency over the subject matter included in the Grade 5 mathematics curriculum, can apply the subject matter knowledge to real-world situations and can reflect on the solution to explain mathematical concepts in real-world contexts. Advanced level students demonstrate the ability to interpret complex situations and can apply their understanding of mathematical concepts to real-world situations. Students can perform above the standard expected in the Grade 5 mathematics curriculum.

The Program for International Student Assessment (PISA), 2022 has used six levels of standard on the mathematics, where level one consists of three sub-scales (OECD, 2024). Similarly, Trends in International Mathematics and Science Study (TIMSS) uses four benchmarks: low, intermediate, high and advanced (NCES, 2019). According to TIMSS benchmark students who perform low level have basic mathematical knowledge; students who perform intermediate level can apply basic mathematical knowledge in simple situation; students who perform high level apply conceptual understanding to solve problems; and students who perform advanced level can apply their understanding and knowledge in a variety of relatively complex situation and explain their reasoning.

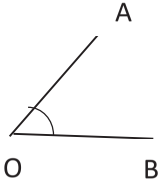
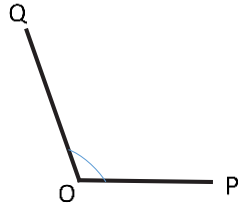
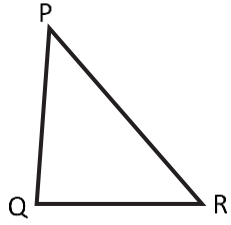
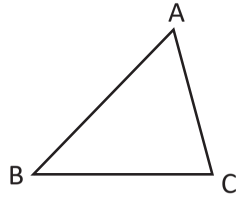
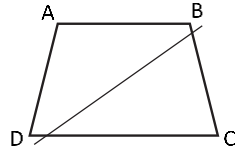
In general, regarding level of standard determination there is no uniform practices. Three to six standards in assessment are in used. For NASA 2025 for Grade 5 has used four standards to categorize students' achievement as in the NASA 2017 framework these are: below-basic, basic, proficient and advanced.

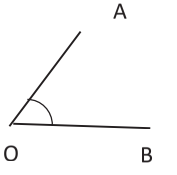
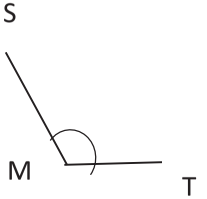
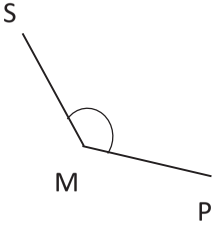
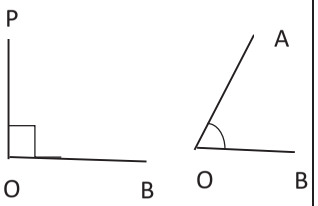
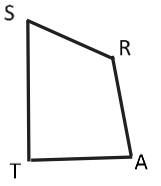
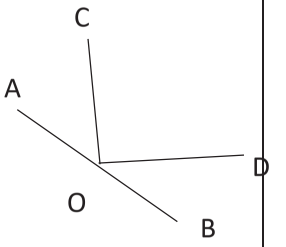
The table given below provides details of these standards and their corresponding descriptions for Grade 5 Mathematics:

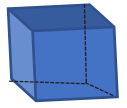
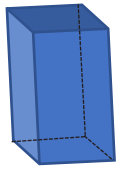
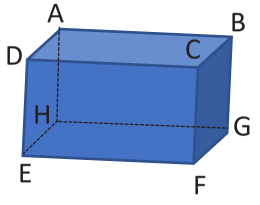
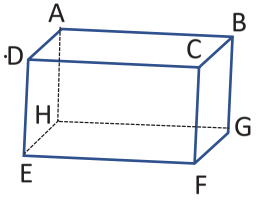
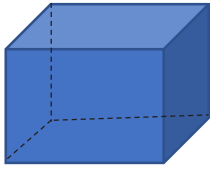
Level of Standards	**General Descriptors of Standards**	**General Descriptors for Mathematics**
Below Basic	Students demonstrate **basic prerequisite** knowledge and skills needed for the grade 5 curriculum.	• Students demonstrate pre-requisite knowledge and skills of mathematical content matter; students can answer the questions involving an easy-to-understand context where all the information needed is given in a simple form. They can carry out simple problems according to direct instructions for pre-requisite knowledge; i.e. concept of angle, read and write the numbers up to thousands by using a place value chart, concept of primes and composite numbers, proper fraction, improper fraction and mixed numbers, 12 hour time; addition and subtraction of same units of distance, capacity and weight; concept of perimeter and area; draw the information from the given bill and budget of a family and bar graph; concept of variable and constant.
Basic	Students demonstrate **basic** understanding of the knowledge and skills set forth in the curriculum.	• Students can demonstrate fundamental concepts and skills for the specified grade. They have straightforward concept of mathematical terminologies, and can use basic algorithm, formulae, procedures to solve the problem in explicit situation; They can carry out simple routine problems; i.e. measure the angle; present the numbers up to six digits in place value table; identify primes and composite numbers up to 50; conversion of mixed numbers into improper fractions; multiplication and division of units of time, distance, weight and capacity by a whole number; calculate perimeter and area of rectangular figure with given length and breadth; complete a simple bill with item name from given list of prices; prepare a monthly budget of a family with given items of expenditure; identify like and unlike terms.

Level of Standards	General Descriptors of Standards	General Descriptors for Mathematics
Proficient	Demonstrate competency over subject matter, including subject-matter knowledge, application of such knowledge to real-world situations and analytical skills appropriate to the subject matter.	• Students demonstrate the functional abilities of mathematical concepts to solve problems whose solutions often require incorporating mathematical knowledge that is not explicitly stated in the task. They can apply systematic, well-planned problem-solving strategies to complete the task; i.e. measure and construct the angles up to 180°; present the numbers in place value table in both national and international system; identify the prime and composite numbers up to 100; addition and subtraction like fractions; solve the real life problems related to units of time, distance, capacity and weight, perimeter and area of rectangle; calculation of the volume of a cuboid; prepare a bill from price list and budget of a family; construct a bar graph in square grid; solve linear equation with one variable by equality axioms.
Advanced	Students demonstrate outstanding performance with an adequate level of abstraction	• Students demonstrate an advanced ability to apply symbolic, formal mathematical operations/ procedures and relationships to develop new approaches and strategies. They can link different mathematical concepts and representations to solve the problems; i.e. measure and construct angles in different situation; compare the numbers in national and international system; solve the problems related to prime and composite numbers; compare improper fractions and mixed numbers; solution the problems related to time when the time is given in compound form (more than one unit); solve the contextual problems related to time, distance, weight and capacity, perimeter, area of rectangle and volume of cuboid; prepare a bill and estimate a budget of particular activity; construct bar graph; solve verbal problem related to linear equation with one variable by equality axiom.

Criterion and standards for grade 5 mathematics

Content Domain	Criterion	Level of Standards			
		Below-Basic	**Basic**	**Proficient**	**Advanced**
Geometry	1. Measurement and construction of angles up to 180°.	Write the name of the given angles and draw angle using a ruler. **Example:** 1. Write the name of the given angle.  2. Draw an angle POQ by using ruler.	1. Measure the given angles up to 180° by using a protractor. (differ by 10°) 2. Write the name of the interior angles of the given triangle and quadrilateral. **Example:** 1. Measure and write the value of the given angle.  2. Write the name of three interior angles of a given triangle?  	1. Construct the given angles up to 180° and measure the interior angles of triangle and quadrilateral by using a protractor. **Example:** 1. Construct an angle of 75° by using protractor. 2. Measure the interior angles of the given triangle by using protractor.  	Measure and construct the angles in different situations. **Example:** In the given quadrilateral, measure the angles ADB and ABC. 

Content Domain	Criterion	Level of Standards			
		Below-Basic	**Basic**	**Proficient**	**Advanced**
	2. Identification of right angle, obtuse angle and acute angle.	Identify the smaller and bigger angles without measuring. **Example:** Write the name of the bigger angle.  	Identify right angle, acute angle and obtuse angle by using a protractor. **Example:** 1. Write the name of the acute, right and obtuse angle from following figures.  	Identify right angle, obtuse angle and acute angle in the given triangle and quadrilateral. **Example:** 1. In given figure,  ……. is an acute angle. …….. is an obtuse angle. …….. is a right angle.	Compare the right angle, obtuse angle and acute angle in different situation. **Example:** Write the types of angles COA, DOC and BOC from the given figure. Also find difference between the angles COA and BOC. 
	3. Demonstration of skills on counting the number of vertices,	Identify cube and cuboid. **Example:** Write name of the following figures.	Identify the vertices, edges and surfaces of cube and cuboid. **Example:** Write the name of the vertices of given cuboid?	Count the number of vertices, edges and surfaces of cube and cuboid. **Example:**	Compare the number of vertices, edges and surfaces of cubical and cuboid shaped objects /solid. **Example:**

<table>
<tr><th rowspan="2">Content Domain</th><th rowspan="2">Criterion</th><th colspan="4">Level of Standards</th></tr>
<tr><th>Below-Basic</th><th>Basic</th><th>Proficient</th><th>Advanced</th></tr>
<tr><td></td><td>edges and surfaces of cube and cuboid.</td><td>  …….
  ……</td><td> 
……..</td><td>How many edges are in a cuboid?
  </td><td>How many times the number of edges are more than surfaces of the given solid?
  </td></tr>
<tr><td>Arithmetic</td><td>4. Demonstration of skills to present the numbers up to 9 digits in place value table, then read and write. (National and international system).</td><td>Read and write the numbers up to thousands by using place value table. (National and international system.)
Example:
Write the number in words from the given place value table.
<table><tr><th>Thousand</th><th>hundred</th><th>Tens</th><th>Ones</th></tr><tr><td>3</td><td>5</td><td>4</td><td>2</td></tr></table></td><td>Read and write the numbers up to 6 digits from place value table. (National and international system)
Example:
1. Write the number in words from the given place value table.
<table><tr><th>Lakh</th><th>Ten Thousand</th><th>Thousand</th><th>hundred</th><th>Tens</th><th>Ones</th></tr><tr><td>2</td><td>1</td><td>0</td><td>5</td><td>4</td><td>2</td></tr></table>2. Write the number in words from the following place value table.</td><td>Present numbers in the place value table, read and write the numbers both in national and international system up to 9 digits.
Example
1. Present 985124506 in national system of place value table.
2. Present 841649685 in international system of place value table.</td><td>Compare the numbers in both in national and international system up to 9 digits in different situations.
Example
Express twenty-nine million, one hundred sixty-four thousand and five hundred seventy-eight in national number system.</td></tr>
</table>

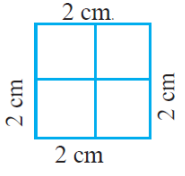
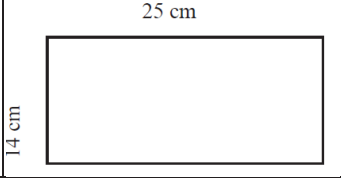
Content Domain	Criterion	Level of Standards			
		Below-Basic	**Basic**	**Proficient**	**Advanced**
			<table><tr><td colspan="3">Thousands</td><td colspan="3">ones</td></tr><tr><td>hundred</td><td>tens</td><td>ones</td><td>hundred</td><td>tens</td><td>ones</td></tr><tr><td>7</td><td>0</td><td>4</td><td>2</td><td>1</td><td>7</td></tr></table>		
	5. Rounding off the five digit numbers to the nearest 100 and 1000.	Rounding off the numbers up to 4 digits to the nearest 100. **Example:** 1. Round 379 to the nearest 100. 2. Round 4523 to the nearest 100.	Rounding off the 5-digit numbers to the nearest 10 and 100. **Example:** 1. Round 81779 to the nearest 10. 2. Round 52123 to the nearest 100.	Rounding off the 5-digit numbers to the nearest 1000. **Example:** Ram earned Rs. 45,869 in June. Round his earning to the nearest 1000.	
	6. Identification prime and composite numbers from 1 to 100.	Concept of prime and composite numbers. **Example:** List the divisors of 6 and 7.	Identify the prime and composite numbers from 1 to 50. **Example:** Circle the prime numbers from given numbers: 32, 57, 62, 71, 9, 23, 19	Identify the prime numbers from 1 to 100. **Example:** Circle the prime numbers from given numbers: 11, 18, 55, 79, 87, 97	Solve the problems related to prime and composite numbers. Example: Is the product of two prime numbers 7 and 11 again a prime number? Write the reason.
	7. Simplification of the problems including up to three operations	Simplify the numerical expressions involving addition (+) and subtraction (-). **Example:** Simplify: a) $20 - 5 + 6$	Simplify the numerical expressions involving any two operations among +, - , × and ÷. **Example:** Simplify: a) $20 \times 2 - 12$	Simplify the numerical expressions involving up to three of the operations +, -, ×, and ÷ . **Example:** Simplify: a) $54 \div 9 + 7 \times 11$	Solve the contextual problems using fundamental operations **Example:** Sita has Rs. 100. She bought 5 pencils at

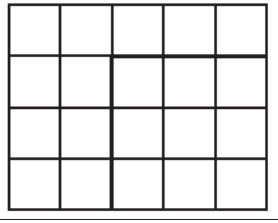
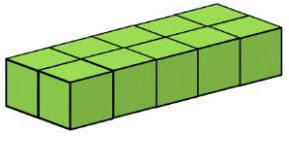
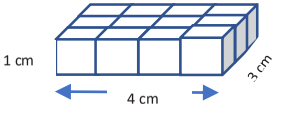
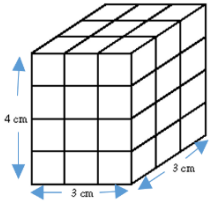
Content Domain	Criterion	Level of Standards			
		Below-Basic	**Basic**	**Proficient**	**Advanced**
	(addition, subtraction, multiplication and division).	b) 12 + 10 - 11	b) $35 \div 7 + 3$	b) $8 \times 2 - 5 + 4$	the rate of Rs.10, an ice cream of Rs. 20, and one packet of biscuit for her brother of Rs. 20. Calculate how much money she did save.
	8. Conversion of the improper fractions and mixed numbers into each other.	Identify proper, improper fractions, mixed numbers. **Example:** Circle the improper fractions from the following: $\frac{2}{3}, \frac{5}{3}, \frac{7}{5}$ Circle the mixed number from the following: $2\frac{2}{3}, \frac{4}{7}, \frac{7}{5}$	Convert improper fractions into mixed numbers. **Example:** Convert $\frac{7}{5}$ into mixed number.	Convert improper fractions and mixed numbers into each other. **Example:** Convert $3\frac{1}{5}$ into improper number.	Compare improper fractions and mixed numbers. **Example:** Which one is bigger among $\frac{7}{5}$ and $2\frac{1}{5}$?
	9. Addition and subtraction of like fractions (up to three).	Identify like & unlike fractions. **Example:** Circle the unlike fraction from the following: $\frac{2}{3}, \frac{5}{3}, \frac{7}{5}$	Add and subtract two like fractions. **Example:** Calculate: a) $\frac{2}{3} + \frac{5}{3}$ b) $\frac{5}{3} - \frac{2}{3}$	Add or subtract up to three like fractions. **Example:** 2. Calculate: a) $\frac{2}{3} + \frac{5}{3} + \frac{1}{3}$ b) $\frac{5}{3} - \frac{2}{3} + \frac{1}{3}$	Solve the contextual problems related to addition and subtraction of like fractions. **Example:** Sita, Gita and Karishma ate one fifth of a *Roti* each. What is the

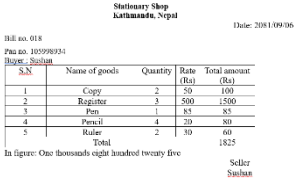
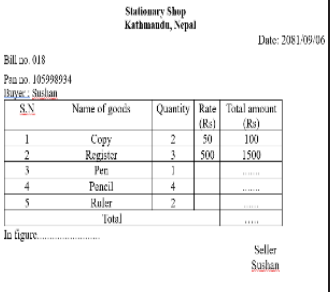
Content Domain	Criterion	Level of Standards			
		Below-Basic	**Basic**	**Proficient**	**Advanced**
					remaining part of the *Roti*?
	10. Conversion of fractions and decimals into each other.	Conversion of proper fractions and decimals each other (with 10 as denominator) into each other. **Example:** a) Convert $\frac{3}{10}$ into decimal. b) Convert 0.4 into fraction.	Conversion of improper fractions and decimals (with 100 as denominator) into each other. **Example:** a) Convert $\frac{37}{20}$ into decimal. b) Convert 2.75 into a fraction.	Conversion of mixed numbers and decimals (with 1000 as denominator) into each other. **Example:** a) Convert $9\frac{13}{125}$ into decimal. b) Convert 12.225 into mixed number.	Compare fractions and decimals in the given context.
	11. Addition and subtraction of decimal numbers.	Present the given decimal numbers in place value table. **Example:** Present 4.6 in place value table.	Add and subtract two decimal numbers up to two decimal values by using place value table. **Example:** Calculate a) 0.31 + 3.60 b) 8.05 - 2.35	Add and subtract up to three decimal numbers up to hundredth. **Example:** Calculate a) 31.257 + 3.601 b) 12.652 - 2.35	Solve the problem of addition and subtraction of decimals in real life context. **Example:** How much centimeter of a ribbon will remain if two pieces 12.91 cm and 9.28 cm are sold from 25 cm ribbon?
	12. Conversion of fraction and	Use of percentage symbol. **Example:** Raju obtained 56 marks out of 100 marks. Write	Convert proper fraction (the denominator multiple of 10) into percentage. **Example:**	Convert fraction and percentage into each other (the lowest form of fraction). **Example:**	Convert fraction and percentage with in different context. **Example:**

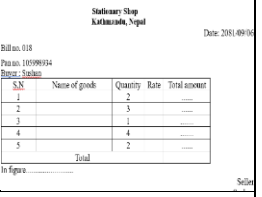
Content Domain	Criterion	Level of Standards			
		Below-Basic	**Basic**	**Proficient**	**Advanced**
	percentage each other.	his mark using percentage symbol.	a) Convert $\frac{6}{20}$ into percentage. b) covert 25 % into fraction	a) Convert $\frac{12}{25}$ to percentage. b) Convert 60% into lowest form of fraction.	Out of 50 cards 35 cards are red. Find the percentage of red cards.
	13. Conversion of decimal and percentage each other.	Convert tenths decimal number into percentage and vice versa. **Example:** a) Convert 0.4 into percentage. b) Convert 20% into decimal.	Convert up to hundredths decimal number into percentage and vice versa. **Example:** a) Convert 0.25 into percentage. b) Convert 55% into decimal.	Convert up to thousandths decimal number into percentage and vice versa. **Example:** **a)** Convert 0.125 into percentage. b) Convert 12.5% into decimal.	Solve the contextual problem related to decimal and percentage.
Measurement	14. Expression of time on 12 hours and 24 hours system.	Identify the time in 12 hour. **Example:** What is the time in the given clock? 	Express the 12 hours' time into 24 hours. **Example:** (a) Daya starts to travel at 10 am and spends 6 hours to reach the destination. Express the time to reach the destination in 24-hour system.		
	15. Multiplication and division of	Add and subtract of the same units of time.	Multiply and divide the units of time (in minute, hour, day, week, month and	Solve the problems of multiplication and division of time.	Solve the problems related to time when the time is given in

Content Domain	Criterion	Level of Standards			
		Below-Basic	**Basic**	**Proficient**	**Advanced**
	the units of time (year and month, week and days, month and days, day and hour and hours and minutes)	**Example:** Deepak takes 1 hour to complete mathematic and 2 hours to complete the homework of science. How much total time does he take to complete the homework of both subjects?	year) with a whole number without changing the unit. **Examples:** (a) Find the product: i)12 hours × 4 ii) 504 minutes × 7 (b) Divide: 5784 seconds by 3	**Examples:** (a) It takes 2 hours to fill a water tank. How much time is required to fill the same type of 5 tanks?	compound form (more than one unit) **Examples:** A school runs for 6 hours each day in which 10 minute is for assembly and 30 minute is for interval. If 8 classes run each day, what will be the duration of each class?
	16. Solution of the problems involving Multiplication and division of distance (mm and cm; cm and m; m and km).	Add and subtract of same units of distance (m and cm, cm and m, m and km) **Example**: a) Add 13m and 29 m b) Subtract 350 meter from 20 meter.	Multiply and divide units of distance by a whole number without conversion. **Examples:** (a) Multiply: i. 247 cm × 4 ii. 504 m × 7 (b) Divide: 5786 meter by 1000	Multiply and divide units of distance by a whole number with conversion. **Examples:** (a) Multiply: 5 m 40 cm by 6 (b) Divide: 12 km 200 m by 5	Solve the contextual problems on multiplication and division related to distance. **Example:** A bus can travel 40 km and 200 m per hour. How much distance would it travel in 5 hours?
	17. Solution of the problems involving multiplication and division in	Add and subtract the same units of capacity (ml and l) **Example**: a) Add 50 ml and 295 ml b) Subtract 30 ml from 55 ml.	Multiply and divide units of capacity by whole number without conversion of units. **Examples:** (a) Multiply: i) 247 ml × 4	Multiply and divide units of capacity by whole number with conversion of units. (*ml* and *l*) **Examples:** (a) Multiply: 8 *l* 400 *ml* by 7	Solve the problems of capacity involving multiplication and division in different situation. **Examples:**

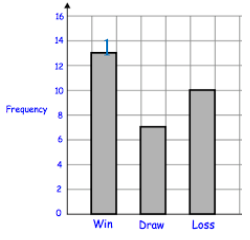
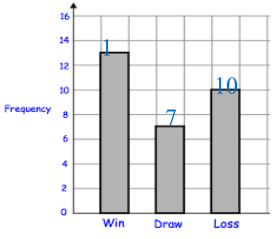
Content Domain	Criterion	Level of Standards			
		Below-Basic	**Basic**	**Proficient**	**Advanced**
	capacity (milliliter and liter).		ii) 504 liters × 7 (b) Divide: i) 7650 ml. by 1000 ii) 960 liter by 16	(b) Divide: 15 *l* 750 *ml* by	How many times does a man take the juice of 1l 400 ml if he takes 200 ml of the juice at a time?
	18. Solution of the problems with Multiplication and division of weight (gram, kilogram and quintal).	Add and subtract the same units of weight (gram and Kilogram, kilogram and quintal) **Example**: a) Add 250 gm and 760 gm b) Subtrac30 kg from 45 kg.	Multiply and divide units of weight by whole number without conversion of units (gram and Kilogram, kilogram and quintal). **Examples:** (a) Multiply: i) 247 g × 5 ii) 50 kg × 4 (b) Divide: i) 7650 kg by 30 ii) 1968 q by 25?	Multiply and divide units of weight by whole number with conversion of units. (*g* and kg, kg and q) **Examples:** (a) Multiply: 8 kg 200g by 5 (b) Divide: 2 q 50 kg by 8	Solve the problems related to multiplication and division of gram kilogram and quintal. **Example:** A packet contains 5 kg and 200 gram of sugar. How much sugar will be there in 5 such packets?
	19. Calculation of perimeters of rectangles.	Count the unit squares of the given shapes and find the perimeter. **Example:** Find perimeter of the given shape. 	Calculate perimeter of rectangular figure with given length and breath. **Example:** Find the perimeter of the given rectangle with given length and breadth. 	Solve of the problems related to perimeter of rectangular surface. **Examples:** Find perimeter of a rectangular ground with length and breadth are 12 meters and 8 meters, respectively.	Solve the problems related to perimeter of rectangle in different situation. **Examples:** The length and breadth of a rectangular park is 20 m and 15 m respectively. Find the length of the wire

Content Domain	Criterion	Level of Standards			
		Below-Basic	**Basic**	**Proficient**	**Advanced**
					required to fens 4 rounds around it.
	20. Solution of the problems involved the area of rectangular.	Find the area of the rectangular object by counting the unit square. **Example:** Find out the area of the following figure by counting its unit squares. 	Find the area of rectangular surface with given length and breadth. **Example:** Find the area of the rectangles having length (l) = 10 cm and breadth (b) = 3 cm.	Solve the problems on the area of rectangular surface. **Example:** What is the area of the rectangular surface of a reading table with 4 m length and 2.5 m breadth?	Solve the problems related to area of and rectangle in different situation. **Example:** The area of a surface of rectangular photo frame and its' length is 120 cm^2 and 40 cm respectively. Find its breadth.
	21. Calculation of volume of given cuboid.	Find number of unit cubes in given cuboids. **Example:** Find the total number of unit cubes in a given cuboid. 	Find the volume of given cuboids by counting unit cubes. **Example:** Find the volume of the given cuboid by counting unit cubes. 	Calculate the volume of a cuboid. **Example:** Calculate the volume of given cuboid. 	Solve the problems related to volume of cuboid. **Examples:** Calculate volume of a wooden duster with 12 cm length, 5 cm breadth and 4 cm height. (b) Calculate the height of a cuboid object if its Volume is 40 cm^3, and its length and breadth

<table>
<tr><th>Content Domain</th><th>Criterion</th><th colspan="4">Level of Standards</th></tr>
<tr><th></th><th></th><th>Below-Basic</th><th>Basic</th><th>Proficient</th><th>Advanced</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>are 5 cm and 4 cm , respectively.</td></tr>
<tr><td>Statistics</td><td>22. Preparation of simple bills</td><td>Draw the information from the given bill.
Examples:
1. Read the given bill and answer the following questions:
 
Stationary Shop
Kathmandu, Nepal
Date: 2081/09/06
Bill no. 018
Pan no. 105998934
Buyer : Sushan
S.N | Name of goods | Quantity | Rate (Rs) | Total amount (Rs)
1 | Copy | 2 | 50 | 100
2 | Register | 3 | 500 | 1500
3 | Pen | 1 | 85 | 85
4 | Pencil | 4 | 20 | 80
5 | Ruler | 2 | 30 | 60
Total | | | | 1825
In figure: One thousands eight hundred twenty five
Seller
Sushan
(a) How much is the cost of a pen?
(b) What is the total amount to be paid in the bill?</td><td>Complete a simple bill with item name from a list of price given.
Examples:
1. Use the list of price given and complete the given bill.
Price list
Pen = Rs. 85
Pencil = Rs. 20
Register = Rs. 500
Ruler = Rs. 30
Copy = Rs. 50
Eraser = Rs. 5
 
Stationary Shop
Kathmandu, Nepal
Date: 2081/09/06
Bill no. 018
Pan no. 105998934
Buyer : Sushan
S.N | Name of goods | Quantity | Rate (Rs) | Total amount (Rs)
1 | Copy | 2 | 50 | 100
2 | Register | 3 | 500 | 1500
3 | Pen | 1 | | .....
4 | Pencil | 4 | | .....
5 | Ruler | 2 | | .....
Total | | | | .....
In figure.....
Seller
Sushan</td><td>Prepare a bill with given price list.
Example:
1. With the help of given price list make a bill of buying 2 pens, 1 register, 2 ruler, 10 copies, and 12 eraser.
Price list
Pen = Rs. 85
Pencil = Rs. 20
Register = Rs. 500
Ruler = Rs. 30
Copy = Rs. 50
Eraser = Rs. 5</td><td>Prepare bill from the given price list in different situation.
Example :
1. The price list of goods are given.
Price list
Pen = Rs. 85
Pencil = Rs. 20
Register = Rs. 500
Ruler = Rs. 30
Copy = Rs. 50
Eraser = Rs. 5
Rabin bought the following items.
2 registers, 10 copies, 2 erasers 5 pencils 3 pens.</td></tr>
</table>

<table>
<tr><th>Content Domain</th><th>Criterion</th><th colspan="4">Level of Standards</th></tr>
<tr><th></th><th></th><th>Below-Basic</th><th>Basic</th><th>Proficient</th><th>Advanced</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Now and prepared the bill and which cost he pay more, pen or copies and by how much? Find it.
 
Stationary Shop
Kathmandu, Nepal
Date: 2081/09/06
Bill no. 018
Pan no. 105998934
Buyer : Sishan
S.N | Name of goods | Quantity | Rate | Total amount
1 | 2 | .....
2 | 3 | .....
3 | 1 | .....
4 | 4 | .....
5 | 2 | .....
Total
In figure.....
Seller</td></tr>
<tr><td></td><td>23. Preparation budget of a family.</td><td>Draw the information from the given budget of a family.
Example:
From the given Monthly Estimated Expense table, write the name of minimum expenditure item.
<table><tr><td>Items</td><td>Price</td></tr><tr><td>Food</td><td>Rs. 7,000</td></tr><tr><td>Education</td><td>Rs. 4,500</td></tr><tr><td>mobile</td><td>Rs. 1,500</td></tr><tr><td>Cloth</td><td>Rs. 4,500</td></tr><tr><td>Others</td><td>Rs. 2,000</td></tr></table></td><td>Prepare a monthly budget of a family with given items of expenditure.
Example: Study the given monthly estimated income and answer the following questions
<table><tr><td>Sources</td><td>Income</td></tr><tr><td>Job</td><td>Rs. 50,000</td></tr><tr><td>Selling milk</td><td>Rs. 4,500</td></tr><tr><td>Selling goat</td><td>Rs. 15,000</td></tr><tr><td>Selling Orange</td><td>Rs. 20,500</td></tr><tr><td>Selling lemon</td><td>Rs. 2,000</td></tr><tr><td>Total</td><td>.....</td></tr></table></td><td>Prepare budget of family.
Example: Study the given monthly income and expenditure of a Sanduk family's and answer the following questions
<table><tr><td>Income</td><td>Expenditure</td></tr><tr><td>Selling vegetable : Rs. 10,000
Selling food Item : Rs. 12,000
Wages : Rs. 10,000</td><td>Food : Rs. 8,000
Education: Rs. 6,000
Interest of bank : Rs. 3,000
Communication: Rs. 2,000
Others: Rs. 4,000</td></tr></table></td><td>Estimate a budget of particular event.
Example:
Your school has decided to go to picnic for the entertainment for the students. Only 100 students are participating in the picnic. Now, prepare a budget for the picnic.</td></tr>
</table>

<table>
<tr><th>Content Domain</th><th>Criterion</th><th colspan="4">Level of Standards</th></tr>
<tr><th></th><th></th><th>Below-Basic</th><th>Basic</th><th>Proficient</th><th>Advanced</th></tr>
<tr><td></td><td></td><td></td><td>What are the sources of income?
Find the total income of that month</td><td>What is the saving amount of Sanduk's family in a month? Find it.</td><td></td></tr>
<tr><td></td><td>24. Tabulation of a given or collected data</td><td>Draw the inormation from given data table.
Example:
Write the name of subject obtained the highest mark and lowest mark from the given table.
<table><tr><th>Subjects</th><th>Marks</th></tr><tr><td>English</td><td>50</td></tr><tr><td>Nepali</td><td>45</td></tr><tr><td>Maths</td><td>60</td></tr><tr><td>Science</td><td>55</td></tr><tr><td>Social</td><td>35</td></tr></table></td><td>Complete the blank table by using the given data.
Example: Complete the following table by using given data set:
red, blue, red, green, blue, red, blue, green, white, white, yellow, red, blue, red.
<table><tr><th>Colour</th><th>No of people</th></tr><tr><td>Red</td><td>5</td></tr><tr><td>Blue</td><td>….</td></tr><tr><td>green</td><td>….</td></tr><tr><td>yellow</td><td>….</td></tr><tr><td>……</td><td>2</td></tr></table></td><td>Tabulate the given/collected data set.
Example:
The marks scored by the students of grade 5 in a unit test of English subject with 20 full marks is given below.
12, 11, 13, 9, 10, 14, 12, 13, 11,12, 11, 12, 13, 14, 15, 13, 14, 12, 12, 12, 12, 13, 11, 12, 12, 11, 10, 10, 12, 14, 15, 9, 13, 11, 12, 11
Present the above data in table.</td><td>Tabulate the collected or given data in different situation.
Example
The details of the score obtained by the students of grade 5 in their health subject test with 18 full marks is given below:
12, 11, 13, 10, 14, 13, 11,12, 11, 12, 13, 14, 15, 14, 12, 18, 12, 17, 13, 16, 12, 15, 11, 9, 16, 13, 14, 15, 18
(a) prepare the table from given data.
(b) Compare number of persons with the highest score and the least score.</td></tr>
</table>

<table>
<tr><th>Content Domain</th><th>Criterion</th><th colspan="4">Level of Standards</th></tr>
<tr><th></th><th></th><th>Below-Basic</th><th>Basic</th><th>Proficient</th><th>Advanced</th></tr>
<tr><td></td><td>25 Presentation of the bar graph using square grid paper</td><td>Draw the information from given bar graph.
Example: From Bar graph, write the number of games won by a team .
 
</td><td>Compare the result from the bar graph
Example: Study the given bar graph and compare the winning game and losing games of games.
 
</td><td>Present the given information in bar graph in grid paper.
Example:
the bar graph from the marks obtained in different subjects. Given in the table
<table><tr><th>Subjects</th><th>Marks</th></tr><tr><td>English</td><td>10</td></tr><tr><td>Nepali</td><td>12</td></tr><tr><td>Maths</td><td>14</td></tr><tr><td>Science</td><td>11</td></tr><tr><td>Social</td><td>9</td></tr></table></td><td>Represent the given information by bar graph in grid paper in different situation.
Example: The scores of 5 teams in first match is given below.
<table><tr><th>Teams</th><th>Scores</th></tr><tr><td>A</td><td>50</td></tr><tr><td>B</td><td>45</td></tr><tr><td>C</td><td>60</td></tr><tr><td>D</td><td>55</td></tr><tr><td>E</td><td>35</td></tr></table>If each team increased 7 score in second match, except C and D, construct bar graph of scores of second match by using grid paper.</td></tr>
<tr><td>Algebra</td><td>26. Addition and subtraction of like terms.</td><td>Identify variable and constant.
Example:
Circle the variables given below:
x, 3, y, 45</td><td>Identify algebraic term and expression, like and unlike terms.
Example:
Write the like terms from the following terms.
3x, 5y, 2x, 7x, 3y</td><td>Add and subtract of like terms.
Example
1. Find the sum of 3x and 5x.
2. Subtract 7y from 10y.</td><td>Solve the problems of algebraic expressions with two variables
Example
Binita has 2x apples and Shila has 5x apples. How many</td></tr>
</table>

Content Domain	Criterion	Level of Standards			
		Below-Basic	**Basic**	**Proficient**	**Advanced**
					apples do they have altogether?
Equation	27. Solution of linear equation with one variable using equality axiom.	Solve the equation with box notation. **Example:** 5 + □ = 9	Solve simple linear equation with one variable by inspection or using hit and trial method. **Example:** Find the value of x if x + 5 =9.	Solve linear equation with one variable using equality axiom. **Example:** Solve: 1. x + 5 = 11. 2. 5x - 1 =14	Solve verbal problem related to linear equation with one variable by equality axiom in different situation. **Example:** Among 35 students in class 5, there are 18 boys and x girls. Express in linear equation form and find the number of girls.

Structure of Test Booklet

There will be two sections in the test booklets. Section A will comprise the multiple-choice test items that measure the knowledge and understanding of the mathematical content domains. This section can also include short questions that measure application and reasoning as well. However, the priority of selecting the cognitive skill will lead to measuring fundamental skills, conceptual understanding, and communicating critical thinking and reasoning by using MCQ items as Selected Response (SR) items. This section comprises mostly the familiar problems in classroom settings.

Section B will measure the learning competencies, especially the competencies in measuring problem-solving skills in the contextual problems of real-life situations. Such items contain authentic information rather than artificial data. The contexts are real-world verbal examples, bills, tables, graphs, figures, pictures, scenes, layouts, and drawings. interest rates of banks cut pieces of newspapers, and historical scripts. Overall, section B will measure the following aspects of the competencies:

- Skill assessment: mastery of specific skills and competencies.
- Real-life context: measuring problem-solving skills in an authentic situation.
- Performance Criteria: measuring proficiency and advanced skills.
- Application and integration: integration of various domains and subjects.
- Holistic Assessment: Measuring skills including problem-solving, critical thinking, communication, and analytical skills.
- Readiness on specific skills: Measuring knowledge, skill, attitude, and value.

The format of Test Items will be as per given Table:

Sections	Type of items	Nature of items	% of weightage
Section A	Selected Response	• Conceptual understanding • Knowledge of content matters • Knowledge of operations and calculations • Routine type of items • Real-life context • Apply knowledge and skills to solve real-life problems	50%
Section B	Constructive Response	• Critical Thinking for reasoning, making a decision • Problem-solving • Applying the knowledge and skills of various domains of mathematics and applying the knowledge and skills of mathematics to solve the problems of other subjects • One problem may contain more than one item • One problem may contain more than one content domain	50%

Specification of Items

The following specification table presents the content domain, weightage percentage, allocation of marks, weightage for SR and CR items and weightage for items of various standards.

Table of specifications for item selection

Content domain	**Criteria No.**	**Weightage (%)**	**Marks allocation**	**Weightage for SR + CR item**	**Weightage for items of various standards**	**Weightage for each item to each cognitive level**
Geometry	1-3	16	6	The weightage of items in each content domain should be around as SR- 50% and CR - 50%	The weightage of items in each set should be around as follows: Below-basic: 15% Basic: 35% Proficient: 35% Advance: 15%	Knowledge: 16% Understanding: 24% Applying: 40% Higher Ability: 20%
Arithmetic	4-13	38	15			
Measurement	14-21	22	9			
Statistics	22-25	9	4			
Algebra	26-27	15	6			
Total			40			

The weightage for items of various standards as mentioned above is tentative as the actual weightage of each standard will be calculated and adjusted based on the students' actual score in the test. However, the above suggested weightage of each standard helps with item selection. Questions should be of both types: selected response (SR), –multiple choice questions (MCQ) and constructed response (CR)–very short questions carrying 1 mark and partially creditable questions carrying 2 marks each. While selecting the items for each content domain it is necessary to select both SR and CR items with a reasonable ratio. If the content areas having a small number of items (weightages) have difficulty in covering six levels of standards in one set of test booklets, such content areas may be covered by three sets of questions, which are administered at a time to different students. While developing and selecting items, various levels of Cognitive Domains should be taken into consideration. Items should be selected according to the six standards defined above; however, we should check and ensure the representation of various cognitive domains at an adequate level.

नमुना प्रश्न

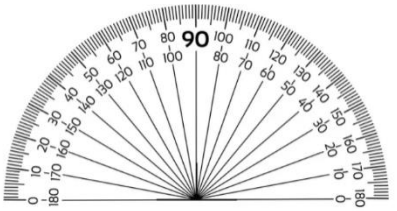
खण्ड क [Group 'A']

(20 × 1 = 20)

सही उत्तरमा ठिक (√) चिह्न लगाउनुहोस् । Tick (√) the correct answer.

(1) दिइएको चित्रको नाम के हो ?

What is the name of the given figure?



a. कम्पास (Compass)

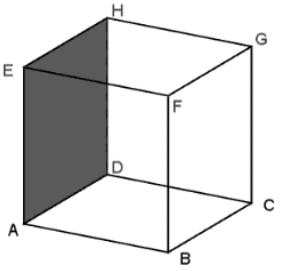
b. रुलर (Ruler)

c. सेट स्क्वायर (Set squares)

d. प्रोट्र्याक्टर (Protractor)

(2) एउटा घनमा कतिओटा सतहहरू हुन्छन् ?

How many surfaces are there in a cube?



a. 1

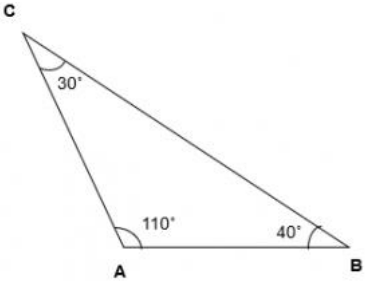
b. 4

c. 6

d. 8

(3) दिइएको त्रिभुजमा न्यूनकोणहरूको योगफल अधिककोणभन्दा कतिले कम छ ?

How much less is the sum of acute angles than the obtuse angle in the given figure?



a. 30

b. 40

c. 50

d. 60

(4) तल दिइएका सङ्ख्याहरूमध्ये संयुक्त सङ्ख्या कुन हो ?

Which one of the following numbers is a composite number?

a. 2 b. 3 c. 4 d. 5

(5) दिइएका मध्ये कुन सङ्ख्या अन्तर्राष्ट्रिय सङ्ख्याङ्कन पद्धतिमा लेखिएको छ ?

Which one of the following numbers is written in the International Numeration System?

a. 3,64,26,82 b. 3,642,682 c. 3,642,82 d. 36,42,682

(6) दिइएका मध्ये भिन्न $\frac{7}{10}$ को दशमलव सङ्ख्या कुन हो ?

Which one is the decimal number of the fraction $\frac{7}{10}$?

a. 0.7 b. 1.7 c. 0.17 d. 0.07

(7) 2.13 र 2.45 को योगफल कति हुन्छ ?

What is the sum of 2.13 and 2.45?

a. 0.32 b. 4.58 c. 45.8 d. 458

(8) रमाले आफूसँग भएको जम्मा स्याउमध्ये $\frac{3}{5}$ भाग उनको भाइलाई दिइन् । यदि उनीसँग 50 ओटा स्याउ रहेछ भने अब उनीसँग कति ओटा स्याउ छन् ?

Rama gave $\frac{3}{5}$ part of total apples to her brother. If she has 50 apples, how many apples does she have now?

a. 10 b. 20 c. 30 d. 40

(9) भिन्न $\frac{25}{50}$ लाई प्रतिशतमा बदल्दा कति हुन्छ ?

Which one is the percentage form of the fraction $\frac{25}{50}$?

a.0.5% b. 25% c. 50% d. $\frac{1}{2}$ %

(10) 18 लाई 9 ले भाग गरी आउने भागफलमा 27 जोड्दा कति हुन्छ ?

What is the result when 27 is added to the quotient of 18 divided by 9?

a. 54 b. 29 c. 21 d. 5

(11) सोनमलाई नेपाली विषयको गृहकार्य पूरा गर्न 1 घण्टा र विज्ञान तथा प्रविधि विषयको 2 घण्टा लाग्छ भने दुवै विषयको गृहकार्य पूरा गर्न जम्मा कति समय लाग्छ ?

Sonam takes 1 hour to complete the homework for Nepali and 2 hours for Science and Technology subjects, How much total time does he take to complete the homework for both subjects?

a. 0.5 घण्टा (0.5 hour) b. 1 घण्टा (1 hour) c. 2 घण्टा (2 hours) d. 3 घण्टा (3 hours)

(12) श्यामलाई एउटा वृत्ताकार पार्कको वरिपरि तीन पटक घुम्न 1 घण्टा 30 मिनेट लाग्छ। उनलाई एक पटक मात्र घुम्न कति समय लाग्छ, पत्ता लगाउनुहोस् ।

Shyam takes 1 hour and 30 minutes to walk three times around a circular park. Find out how long time takes him to walk once?

a. 20 मिनेट (20 minutes)
b. 30 मिनेट (30 minutes)
c. 1 घण्टा (1 hour)
d. 2 घण्टा (2 hours)

(13) 48 सेन्टिमिटरको 6 गुणा कति हुन्छ ?

What is 6 times of 48 centimeters?

a. 8 सेन्टिमिटर (8 centimeters)

b. 54 सेन्टिमिटर (54 centimeters)

c. 288 सेन्टिमिटर (288 centimeters)

d. 2448 सेन्टिमिटर (2448 centimeters)

(14) 4 लिटर 300 मिलिलिटरलाई 7 ले गुणन गर्दा कति हुन्छ ?

What is the result when 4 liters 300 milliliters multiply by 7 ?

a. 11 लिटर 300 मिलिलिटर (11 liters 300 milliliters)

b. 28 लिटर 300 मिलिलिटर (28 liters 300 milliliters)

c. 30 लिटर 100 मिलिलिटर (30 liters 100 milliliters)

d. 49 लिटर (49 liters)

(15) 5 लिटर 500 मिलिलिटर सर्बत धान काट्ने खेतालालाई बराबर बाँडियो । यदि प्रत्येकलाई 500 मिलिलिटरका दरले बाँडेको भए उक्त काममा जम्मा कति जना खेताला रहेछन् ?

5 liter 500 milliliter of juice is distributed equally to the paddy harvesting workers. If 500 milliliters of juice is distributed for each worker, how many workers are there?

a. 110 b. 11 c. 6 d. 5

(16) श्री कृष्ण मा.वि.का कक्षा 5 मा अध्यनरत विद्यार्थीले एउटा वनभोज कार्यक्रममा गरेको खर्चको बिल दिइएको छ ।

The bill of expenses for a picnic program of class 5 students of Shree Krishna Secondary School is given below.

शीर्षक (Title)	**खर्च (रु.) (Expenses in Rs.)**
टिकट (Ticket)	रु.1,500
पानी (Water)	रु.1,000
बस भाडा (Bus fare)	रु.5,000

टिकटमा खर्च भएको भन्दा पानीमा कति रुपियाँ कम खर्च भएछ ?

How much less amount is spent in water than in ticket?

a. Rs. 500 b. Rs. 1,000 c. Rs. 1,500 d. Rs. 2,500

(17) एक जना परिवारको मासिक बजेट रु 60, 000 छ । यदि कुनै महिनामा जम्मा बजेटको एक तिहाइ रकम मात्र खर्च भएछ भने कति रकम बचत भएछ ?

The monthly budget of a family is 60,000. If the family spends one-third of the budget in a month, how much money does it save?

a. Rs. 20,000 b. Rs. 40,000 c. Rs. 60,000 d. Rs. 80,000

(18) बिजीय अभिव्यञ्जक $4x^2y + 3xy + 3x + xy - 5$ मा दुईओटा पदहरू सजातीय छन् । ती सजातीय पदहरूको योगफल कति हुन्छ ?

There are two like terms in the algebraic expression $4x^2y + 3xy + 3x + xy — 5$. What is the sum of those like terms?

a. $8xy$ b. $6xy$ c. $4xy$ d. $2xy$

(19) समीकरण $3p = 12$ मा p को मान कति हुन्छ ?

What is the value of p in equation $3p = 12$?

a. 4 b. 9 c. 15 d. 36

(20) गोमासँग भएको रकमको दुई गुणाबाट 5 घटाउँदा 35 हुन्छ भने उनीसँग कति रकम रहेछ ?

How much money does Goma have if 5 is subtracted from twice her money, the result is 35 ?

a. 5 b. 15 c. 20 d. 40

खण्ड ख [Group 'B']

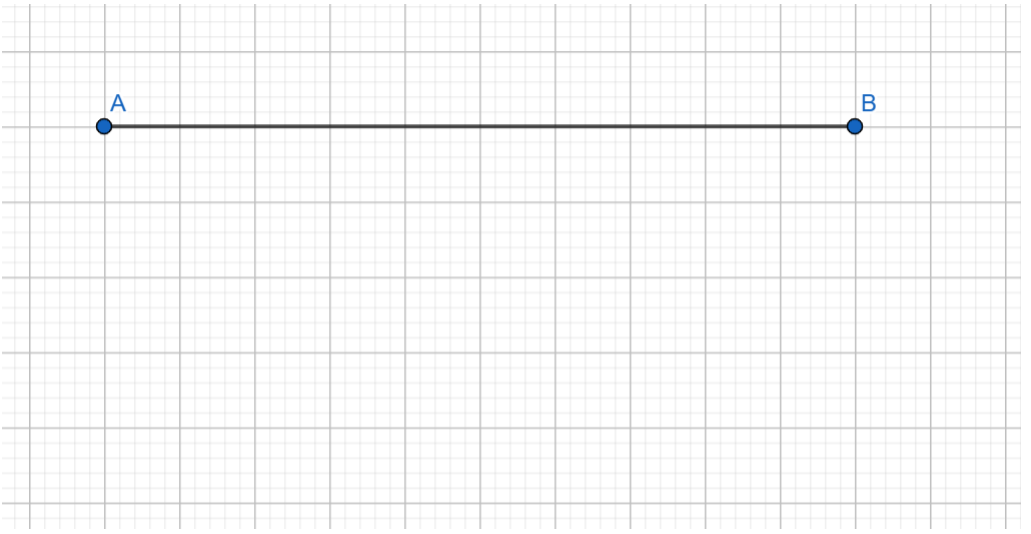
तलका प्रश्नहरूको उत्तर दिनुहोस् : Answer the following questions:

(21) प्रोट्र्याक्टरको प्रयोग गरी 75° को कोण खिची नाम लेख्नुहोस् ।

Draw an angle of 75° using a protractor and write the name of the angle. [2]

(22) दिइएको रेखाखण्ड AB सँग समानान्तर हुने अर्को रेखाखण्ड CD खिच्नुहोस् ।

Construct the line segment CD with parallel to the given line segment AB. [1]



(23) के दुईओटा रूढ सङ्ख्याहरु 7 र 11 को गुणनफल रुढ सङ्ख्या नै हुन्छ ? कारण लेख्नुहोस् ।

Is the product of two prime numbers 7 and 11 a prime number? Write the reason. [1]

(24) 7,575 लाई अक्षरमा लेख्नुहोस् ।

Write the number name of 7,575. [1]

(25) रसिलाले प्रति प्याकेट 4 ओटा सिसाकलम भएको 12 ओटा प्याकेटमा भएका जम्मा सिसाकलम 6 जनालाई बराबर बाँडिन् । अब उनले पाउने सङ्ख्यामा 4 ओटा सिसाकलम थपेर लिइन् भने उनीसँग जम्मा कतिओटा सिसाकलम भए ?

If Rashila divides 12 packets of pencil having 4 pencils in a packet to 6 persons. She took 4 additional pencils. How many pencils does Rashila have? [2]

(26) सरल गर्नुहोस् । Simplify. $\frac{4}{5} - \frac{1}{5} + \frac{2}{5}$ [2]

(27) 12.5 % लाई भिन्नमा रूपान्तरण गर्नुहोस् ।

Convert 12.5% into the fraction. [1]

(28) 23 ग्राम र 46 ग्राम को योगफल कति हुन्छ ?

What is the sum of 23 grams and 46 grams? [1]

(29) 9 क्विन्टल 60 किलोग्रामलाई 8 ले भाग गर्नुहोस् ।

Divide 9 quintal 60 kilogram by 8. [1]

(30) एउटा भुजा 7 सेन्टिमिटर भएको घनाकार बाकसको आयतन कति हुन्छ ?

What is the volume of a cubical box with each side of 7 centimeters in length? [1]

(31) कक्षा 5 मा अध्यनरत विद्यार्थीहरूमध्ये 120 cm उचाइ हुने 4 जना, 125 cm उचाइ हुने 10 जना र 127 cm उचाइ हुने 6 जना छन् ।

There are 4 students of 120 cm height, 10 students of 125cm height and 3 students of 127 cm height in grade 5.

(क) उक्त सूचनालाई दिइएको तालिकामा भर्नुहोस् ।

Complete the following table from the given information. [1]

उचाइ (Height)			
विद्यार्थी सङ्ख्या (No of students)			

(ख) 125 cm उचाइ हुने विद्यार्थी कति प्रतिशत रहेछन् ?

What is the percentage of students having 125 cm height? [1]

(32) बिजीय अभिव्यञ्जक $2x + 3y + a$ मा a को मान कति हुँदा योगफल $2x + 3y$ हुन्छ ?

What is the value of a in the algebraic expression $2x + 3y + a$ such that the sum is $2x + 3y$? [2]

(33) काशीसँग m ओटा सुन्तला छन् । उनीसँग भएको सुन्तलामा 8 ओटा सुन्तला थप्दा दोब्बर सुन्तला हुन्छ भने उनीसँग कतिओटा सुन्तला रहेछन् ?

Kashi has m number of oranges. If he added 8 oranges then the number of oranges becomes double, how many oranges does he have? [1]

2.4 Assessment Framework for Science and Technology

Introduction

The National Assessment of Student Achievement (NASA) for Grade 5 assesses the level-wise competencies of the approved curriculum for respective subjects. This also includes content, domain and learning outcomes to be tested in each subject so that the assessment will be designed to measure students' performance against the curricular competencies. As a test blueprint it presents a table of specifications for item construction. In the case of NASA, subject-wise assessment will be taken as the cognitive domain of the stakeholders objectives. The current curriculum emphasizes the competencies and learning outcomes. So, this assessment framework emphasizes assessing students' competencies and performance related to the learning outcomes of the curriculum.

Content Domain Identification

In the context of grade 5 Science and Technology, an assessment framework would enable stakeholders to assess student performance in a structured and systematic manner, ensuring that assessments are aligned with learning outcomes and that students are being assessed on the knowledge and skills deemed most important for success in science and technology at this grade. This would enable stakeholders to identify areas where students may be struggling and to provide targeted support, leading to improved learning outcomes.

विज्ञान तथा प्रविधि विषयको तहगत सक्षमता (कक्षा ४-५) Level wise learning competencies of Science and Technology (Grade 4-5)

कक्षा ४-५ को विज्ञान तथा प्रविधि विषयको अध्ययनपश्चात् विद्यार्थीमा निम्नलिखित सक्षमता हासिल हुने छन् : After studying the science and technology subjects of grade 4-5, students will acquire the following competencies:

१. वैज्ञानिक सिकाइ प्रक्रियाको बोध तथा विज्ञान प्रक्रियागत सिपको प्रयोग Understanding of the scientific learning process and application of science process skills

२. दैनिक जीवनमा सूचना तथा सञ्चार प्रविधिको प्रयोग र सावधानीका उपायहरू अवलम्बन Use of information and communication technology in daily life and adoption of precautionary measures

३. जीवको वर्गीकरण तथा जीवन प्रक्रियासम्बन्धी आधारभूत जानकारी Basic information on classification and life processes of organisms

४. जीव र वातावरणबिचको अन्तरसम्बन्ध र सन्तुलनको महत्त्वबोध A great understanding of the interrelationship and balance between organisms and the environment

५. मौसम र प्राकृतिक विपद्को आधारभूत जानकारी तथा सोअनुसारका अनुकूलनका उपायहरू अवलम्बन Basic knowledge of weather and natural disasters and adoption of adaptation measures accordingly

६. पदार्थ र शक्तिका आधारभूत विशेषताहरूको जानकारी लिई दैनिक जीवनमा प्रयोग Acquiring information of basic properties of matter and energy and its their application in daily life.

७. पृथ्वीको बनोट तथा आकाशीय पिण्डहरूको सामान्य जानकारी General information about the structure of the earth and celestial bodies.

The content domain and their weightage drawn from the grade five curriculum are as follows:

Unit	Content Domain	Working hour	Weightage percentage
Scientific learning	Physical Science and ICT	10	59
Information, Communication and Technology		30	
Matter		30	
Energy in Daily Life		25	
Organism and Environment	Life Science	10	28
Classification of Living Beings		20	
Life Process		15	
The Earth and Space	Earth Science	20	13
Total			100

Cognitive domain

For grade 5, NASA in Science and technology, test items will be used to assess students' remembering, understanding, applying, and higher-order abilities. These questions will be based on the cognitive domain of Revised Bloom's taxonomy, which is a hierarchical model of cognitive skills that ranges from simple remembering to complex reasoning. The levels of cognitive domain are adopted from Revised Bloom's Taxonomy for learning (Anderson & Krathwohl, 2001). Among six levels of taxonomy first three Remembering, Understanding and Applying are considered separately and the last three analysing, evaluating and creating are combined as higher ability.

1. Remembering: This category assesses students' recall of facts and information and identification ability.

2. Understanding: This category assesses students' ability to understand and explain information.
3. Applying: This category assesses students' ability to apply knowledge and skills in new and practical situations.
4. Higher ability: This category assesses students' ability to think critically, solve problems, and make judgments.

As in the Revised Bloom's definition remembering shows memory of previously learned material by identifying and recalling facts, terms, basic concepts, and answers. Understanding demonstrates understanding of facts and ideas by interpreting, exemplifying, classifying, comparing, translating, inferring, explaining and giving descriptions, and stating main ideas. Applying includes solving problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way (Aderson & Karthwohl, 2001). Higher ability is not limited to the solution of routine problems but also includes unfamiliar situations, complex contexts, and solving multi-step problems using more than one relation and contexts (IEA, 2015). Higher ability item focuses on differentiating the factors on the basis of standard and criteria, organising the elements with logically, attributing, justifying with logic, critiquing, creating original ideas, opinions with logics.

"The cognitive dimension is divided into three domains that describe the thinking processes students are expected to engage in when encountering the science items developed for TIMSS 2023. The first domain, *knowing*, addresses the student's ability to recall, recognize, describe, and provide examples of facts, concepts, and procedures that are necessary for a solid foundation in science. The second domain, *applying*, focuses on using this knowledge to compare, contrast, and classify groups of objects or materials; relating knowledge of a science concept to a specific context; generating explanations; and solving practical problems. The third domain, *reasoning*, includes using evidence and science understanding to analyze, synthesize, and generalize, often in unfamiliar situations and complex contexts" (TIMSS, 2023).

The following cognitive domain in the NASA grade 5 test is prepared by incorporating the TIMSS assessment framework, 2023 and the grade 5 science and technology curriculum of Nepal.

Representation of various cognitive domains in the NASA test

Cognitive Domain	**Weightage**
Remembering	20%
Understanding	30%
Applying (Familiar situation)	30%
Applying (Unique situation)	
Higher ability	20%
Total	**100%**

Structure of Test Booklets

There will be two sections in the test booklets. Section A will comprise the multiple-choice test items that measure the remembering, understanding, applying and higher-order ability of the science and technology content domains. This section can also include short questions that measure all the levels as mentioned above. However, the priority of selecting the cognitive skill will lead to measuring fundamental skills, conceptual understanding and communicating critical thinking and reasoning by using MCQ items as Selected Response (SR) items.

Section B will also measure the learning competencies and learning outcomes from remembering to higher abilities. This section will focus especially on the competencies in measuring problem-solving skills in the contextual problems of real-life situations. Such items contain authentic information rather than artificial data. The contexts are real-world verbal examples, charts, tables, graphs, figures, pictures, scenes, layouts and drawings, cut pieces of newspapers, and historical scripts.

Overall, sections A and B will measure the following aspects of the competencies:

1. Knowledge and understanding of the contents.
2. Skill assessment: mastery of specific skills and competencies.
3. Real-life context: measuring problem-solving skills in an authentic situation.
4. Performance Criteria: measuring proficiency and advanced skills.
5. Application and integration: integration of various domains and subjects.
6. Holistic Assessment: Measuring skills including problem-solving, critical thinking, communication and analytical skills.
7. Readiness on specific skills: Measuring knowledge, skill, attitude and value.

The format of Test Items will be as per given table :

Sections	**Type of items**	**Nature of items**	**% of weightage**
Section A	Selected Response (SR)	• Conceptual understanding • Knowledge of content matters • Knowledge of procedures and calculations • Real-life context • Apply knowledge and skills to solve real-life problems, including critical thinking for reasoning, making decisions • Problem-solving • Applying the knowledge and skills of various domains of science and applying the knowledge and skills of science to solve the problems of other subjects • One problem may contain more than one item	50%
Section B	Constructive Response (CR)		50%

Learning Competency and Performance Standards

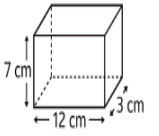
Level-wise learning competencies as prescribed by the basic level science curriculum (grades 4 to 5). For grade 5 NASA in science and technology, those grade-wise learning competencies are taken as learning competencies. The curriculum also identifies the grade-wise learning outcomes for grade 5 science. Performance standards are determined on the basis of learning competencies and grade-wise learning outcomes of grade 5. Four-level performance standards are defined for each competency, which will be described in this section. Difficulty level is in ascending order from level 1 to level 4.

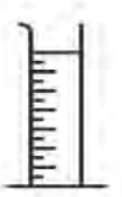
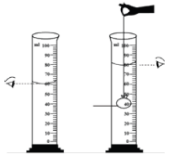
Learning competency generally tells what the expected competencies are, but it does not tell how well the student demonstrates the competencies. The performance standards in each learning competency describe different levels of competencies, and therefore, performance standards tell how well the student demonstrates the competencies. The similar types of four categories of proficiencies have also been used in PISA (OECD, 2013). The following table describes performance standards in each learning competency.

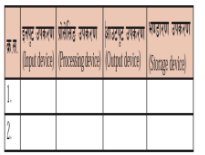
Four Levels of Performance Standard

1.	***Below-Basic Level***: Students generally perform significantly below the standard required for the grade level; however, students could demonstrate a partial mastery of prerequisite knowledge and skills that are essential for grade 5 curriculum. Students whose achievement scores fall within this category demonstrate foundational knowledge and skills but may require additional support and guidance to reach basic competency levels.
2	***Basic Level***: Students generally perform slightly below the standard for the grade level. However, they demonstrate an adequate mastery of prerequisite knowledge, skills with a basic understanding of knowledge and skills specified by the curriculum of the grade level, and demonstrate a partial proficiency in applying such knowledge and skills. Students categorized at the basic level possess fundamental skills and knowledge within the assessed domain. They demonstrate a satisfactory understanding of the subject matter but may still have room for improvement.
3	***Proficient Level***: Students generally perform at the required standard for the grade level. They demonstrate proficiency over the subject matter, including subject matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate for the subject matter. This category comprises students who exhibit a high degree of competency and mastery in the assessed domain. They demonstrate advanced skills and understanding, indicating a strong grasp of the subject matter.
4	***Advanced Level***: Students generally perform above the standard for the grade level. They demonstrate an advanced ability to apply knowledge and skills specified in the curriculum, including the ability to combine more than one relation to solve the problems in unfamiliar situations. Students classified at the advanced level demonstrate exceptional proficiency and mastery in the assessed domain. They exhibit a deep understanding of complex concepts and are capable of applying their knowledge in sophisticated ways.

Learning competencies, learning outcomes, and performance standards for science

S. N.	Learning Competencies	Unit/ Area	Learning Outcomes	Performance Standards			
				Below-Basic	Basic	Proficient	Advanced
1	वैज्ञानिक सिकाइ प्रक्रियाको बोध तथा विज्ञान प्रक्रियागत सिपको प्रयोग Understanding of the scientific learning process and application of science process skills	वैज्ञानिक सिकाइ Scientific learning	१.१ वैज्ञानिक सिकाइ प्रक्रियाको परिचय दिन To introduce the scientific learning process १.२ अवलोकन (observation), प्रयोग (experiment) र सोधखोज (inquiry) सम्बन्धी सामान्य क्रियाकलापहरू गर्न To carry out general activities of observation, experiment and inquiry १.३ वैज्ञानिक अध्ययनमा अवलोकन, प्रयोग र सोधखोजको महत्त्व पत्ता लगाउन To find out the importance of observation, experiment and inquiry in scientific study १.४ वैज्ञानिक उपकरणहरूका स्कम्याटिक (schematic) चित्र बनाउन र प्रयोग उल्लेख गर्न To draw a schematic drawing of scientific instruments and mention their use	1. Introduce the scientific learning process E.g. Define scientific process skills. 2. Name the devices to measure length, mass and time. E.g. Which instrument does a shopkeeper use to measure mass of a body?	1. Explain observation, experiment and inquiry in research inside and outside of lab. E.g. Mention any two importances of observation in experimental work. 2. Mention the uses of scientific instruments. E.g. What is the use of the given scientific instrument?	1. Draw a schematic diagram of scientific instruments E.g. Draw the schematic diagram of funnel. 2. Measure length, mass and time using a meter scale, scales and stopwatch. E.g. Measure the given line segment using ruler. 2. Measure the volume of an irregular object by using	1. Measure the length, breadth and height of the cuboid and calculate the volume of it. E.g. Calculate the volume of the given cuboid by measuring its length, breadth and height.  1. Convert units of length, mass and time

S. N.	Learning Competencies	Unit/ Area	Learning Outcomes	Performance Standards			
				Below-Basic	Basic	Proficient	Advanced
			१.५ लम्बाइ, पिण्ड र समयलाई क्रमशः मिटर स्केल, तराजु र स्टपवाचले मापन गर्न To measure length, mass and time using a meter scale, balance and stopwatch			measuring cylinder. E.g., Find out the volume of the given irregular body immersed in water. 	E.g. 1. Convert 1.5 metres into centimetres. E.g. 2 Convert 2 hours into seconds.
2	दैनिक जीवनमा सूचना तथा सञ्चार प्रविधिको प्रयोग र सावधानीका उपायहरू अवलम्बन Use of information and communication technology in daily life and adoption	सूचना तथा सञ्चार प्रविधि (Information & Communication Technology	२.१ सञ्चारका विभिन्न स्रोतहरूका उदाहरण दिन र ती स्रोतहरूबाट आवश्यक सूचनाहरू खोजी गर्न To give examples of different sources of communication and to find the necessary information from those sources २.२ सञ्चारका प्रकारहरू (वैयक्तिक सञ्चार, अन्तरवैयक्तिक सञ्चार, आम सञ्चार) को परिचय दिन र प्रयोग गर्न To introduce and use types of	1. Give examples of different sources of communication E.g. List any two examples of sources of communication.	1.Distinguish similarities and differences between computers and humans E.g. Prepare a T-Chart comparing computers and human beings.	1.Find the necessary information from sources of communication. E.g. How can information be obtained from internet internet-	1.Analyze the importances mass communication. E.g. How can you communicate with public media during a natural disaster to inform local people about it.

S. N.	Learning Competencies	Unit/ Area	Learning Outcomes	Performance Standards			
				Below-Basic	Basic	Proficient	Advanced
	of precautionary measures		communication (personal communication, interpersonal communication, mass communication) २.३ सिकाइका लागि मोबाइलको प्रयोग गर्न To use mobile phones for learning २.४ कम्प्युटर र मानवबिच समानता र भिन्नता छुट्याउन To distinguish similarities and differences between computers and humans २.५ वर्ड प्रोसेसर (word processor) को प्रयोग गरी सरल डकुमेन्ट तयार गर्न To prepare a simple document using a word processor २.६. Paint software अभ्यास गर्न र typing software चलाउन To practice paint software and run typing software	2. Define communication. E.g. What type of communication is FM radio?	2. Introduce different types of communication E.g. what is personal communication? 2. Categorizing parts of a computer as input, processing, output and storage devices. E.g., Prepare a list of input, processing, output and storage devices of a computer as shown.  	connected mobile and computer? 2. Use mobile phones for learning E.g. How do you use a mobile phone for learning new concepts?	2.Use different icons of paint software and typing software E.g. You have typed an essay about “Aim in My Life” on your computer. If you have to increase the font size of the text written as a title, which icon do you use and how do you increase the font size? 2. Compare computers and humans based on intelligence, storage capacity, and working capacity.

S. N.	Learning Competencies	Unit/ Area	Learning Outcomes	Performance Standards			
				Below-Basic	Basic	Proficient	Advanced
							E.g., how are human beings more intelligent than computers
3	३. जीवको वर्गीकरण तथा जीवन प्रक्रियासम्बन्धी आधारभूत जानकारी Basic information on classification and life processes of organisms	जीवहरूको वर्गीकरण Classification of Organisms	४.१ मेरुदण्ड भएका जनावरहरूका सामान्य विशेषताहरू वर्णन गर्न To describe the general characteristics of vertebrates ४.२ बिरुवाका बिउ, जरा, डाँठ, पातका लक्षणहरू तुलना गरी तिनीहरूलाई एकदलीय र दुईदलीय समूहमा वर्गीकरण गर्न To compare the characteristics of seeds, roots, stems, leaves of plants and categorize them into monocotyledonous and dicotyledonous ४.३ बिरुवाका विभिन्न भाग (जरा, डाँठ, पात, फूल, फल) का कार्यहरू वर्णन गर्न To describe the functions of different parts of a plant	1. Identification of different vertebrates. E.g. List any two examples of vertebrates. 2. Identification of monocotyledonous and dicotyledonous plants. E.g., Give any one example of monocotyledonous and dicotyledonous plants each.	1. State the general characteristics of vertebrates. E.g. List any two characteristics of vertebrates. 2. Describe the characteristics of monocotyledonous and dicotyledonous plants. E.g. Write any two characteristics of monocotyledonous and dicotyledonous plants each.	1. Classification of vertebrates in different classes based on their characteristics. E.g. A frog and a snake both are aquatic and oviparous, and both they are kept in different classes of vertebrates. Explain. 2. Distinguish between animals and plants based on life processes. E.g., Prepare a T-Chart	1. Differentiate between vertebrates and invertebrates based on their characteristics. E.g. "Vertebrates are more developed than invertebrates." Justify it in two points. 2. Explain the functions of different parts of a plant (root, stem, leaf, flower, fruit). E.g., What happens if the plants have no roots?

S. N.	Learning Competencies	Unit/ Area	Learning Outcomes	Performance Standards			
				Below-Basic	Basic	Proficient	Advanced
			(root, stem, leaf, flower, fruit). ५.१ जीवन प्रक्रियाको सामान्य परिचय दिन To give a general introduction to life processes ५.२ पोषण, निष्कासन, श्वासप्रश्वास, परिवहन र प्रजनन क्रियालाई जीवन प्रक्रियाका रूपमा व्याख्या गर्न To explain nutrition, excretion, respiration, transport and reproduction as life process ५.३ जीवन प्रक्रियाका आधारमा जनावर र बिरुवाहरूबिच भिन्नता छुट्याउन To distinguish between animals and plants based on life processes		3. Comparison of monocotyledonous and dicotyledonous plants based on seeds, roots, stems, and leaves of plants. E.g. differentiate between monocotyledon plants and dicotyledon plants based on their root and seeds.	distinguishing animals and plants based on life processes. 3. Identify the functions of different parts of a flowering plant. E.g. Draw the figure of part of a bean plant that absorbs water from the soil.	2. Explain nutrition, excretion, respiration, transport and reproduction as life processes. E.g., Respiration and breathing are different processes. Present your strong argument to justify it.
4	जीव र वातावरणबिचको अन्तरसम्बन्ध र सन्तुलनको महत्त्व बोध A great understanding		३.१ जीवहरूलाई ताप र प्रकाश शक्ति आवश्यक पर्छ भन्ने तथ्यलाई तर्कसहित प्रस्तुत गर्न To demonstrate the fact the living things need heat and light energy with arguments	1. Identify the sources of energy available in the	1. Explain the effects of excessive and unnecessary use of energy	1. Explain ways to reduce the impact of excessive use of energy on the environment	1. Demonstrate the fact that living things need heat and light energy

S. N.	Learning Competencies	Unit/ Area	Learning Outcomes	Performance Standards			
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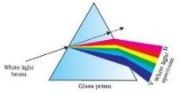
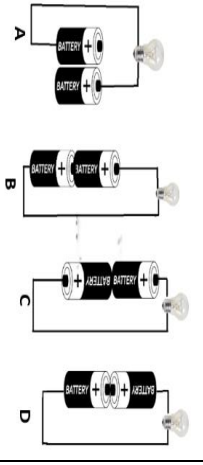
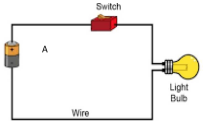
	of the interrelationship and balance between organisms and the environment		३.२ वातावरणमा उपलब्ध ऊर्जाका स्रोतहरू पहिचान गर्न To identify the sources of energy available in the environment ३.३ ऊर्जाको अत्यधिक र अनावश्यक प्रयोगले वातावरणमा पार्ने असरहरू बताउन To explain the effects of excessive and unnecessary use of energy on the environment ३.४ ऊर्जाको अधिक प्रयोगले वातावरणमा पार्ने असर घटाउने उपायहरू बताउन र व्यवहारमा उतार्न To explain ways to reduce the impact of excessive use of energy on the environment and demonstrate in their behaviours	environment E.g., Give any one example of sources of energy available in the environment	on the environment E.g., Explain any two effects of excessive and unnecessary use of energy on the environment.	and demonstrate in their behaviours E.g. What role can you play to reduce the impact of excessive use of energy on the environment?	with arguments E.g. How would you demonstrate the fact that living things need heat and light energy? Explain with a suitable practical method? E.g., What does the given picture represent? What are the basic requirements for the life process shown in the picture? 

S. N.	Learning Competencies	Unit/ Area	Learning Outcomes	Performance Standards			
				Below-Basic	Basic	Proficient	Advanced
5	पदार्थ र शक्तिका आधारभूत विशेषताहरूको जानकारी लिई दैनिक जीवनमा प्रयोग Knowledge of basic properties of matter and energy and application in daily life	पदार्थ र दैनिक जीवनमा शक्ति Matter & Energy in the Daily Life	६.१ पिण्ड हुने र ठाउँ ओगट्ने वस्तुलाई पदार्थका रूपमा परिभाषित गर्न To define matter as something that has mass and occupies space ६.२ पदार्थका भौतिक गुणहरूको परीक्षण गर्न To test the physical properties of substances ६.३ भौतिक गुणका आधारमा पदार्थहरूलाई ठोस, तरल र ग्यासमा वर्गीकरण गर्न To classify substances into solids, liquids and gases based on their physical properties ६.४ ठोस, तरल र ग्यासका भौतिक गुणहरूको तुलनात्मक अध्ययन गर्न To comparatively study the physical properties of solids, liquids and gases ६.५ तापले पदार्थमा पार्ने असरहरूको व्याख्या गर्न To explain the effects of heat on matter ६.६ दैनिक जीवनमा तापका असरको फाइदा र बेफाइदा खोजी गर्न To explore	1. Define matter 2. Define mixture 3. Give examples of different types of mixtures (solid and solid, solid and liquid, liquid and liquid, liquid and gas, gas and gas) E.g. Give an example of solid and solid mixture. 4. List out the various methods of separation of	1. Classify substances into solids, liquids, and gases based on physical properties. E.g. what type of mixture is Soda water? 2. Identify homogeneous and heterogeneous mixtures E.g. which is the heterogeneous mixture between muddy water and sugar water? 3. Define various methods of separation of mixture (handpicking,	1. Test the physical properties of substances. 2.Perform a comparative study of the physical properties of solids, liquids, and gases. E.g. water can exist in three states of matter. Justify this statement with your argument. 3.Prepare mixtures by mixing different substances and introduce the concept of mixture	1. Compare the substances based on their physical properties (e.g. solid-solid, liquid-liquid, gas-gas, liquid-solid etc) E.g. Distinguish between salt water and soda water based on their physical properties of their components. 2. Explain the effects of heat on substances 3. Explore the advantages and disadvantages of the effects of heat in daily life E.g. How is heat useful in storage

S. N.	Learning Competencies	Unit/ Area	Learning Outcomes	Performance Standards			
				Below-Basic	Basic	Proficient	Advanced
			the advantages and disadvantages of heat effects in daily life ६.७ विभिन्न पदार्थहरू मिसाई मिश्रण बनाउन र मिश्रणको परिचय दिन To prepare mixture by mixing different substances and introduce the mixture ६.८ विभिन्न स्वरूपका मिश्रणहरू (ठोस र ठोस, ठोस र तरल, तरल र तरल, तरल र ग्यास, ग्यास र ग्यास) का उदाहरण दिन To illustrate different forms of mixture (solid and solid, solid and liquid, liquid and liquid, liquid and gas, gas and gas) ६.९ समान र असमान मिश्रण चिन्न र तिनीहरूबिच भिन्नता छुट्याउन To recognize homogenous and heterogeneous mixtures and distinguish between them ६.१० मिश्रण छुट्याउने सामान्य विधिहरू (हातले टिप्ने, थिग्राउने र निथार्ने (	mixture (handpicking, sedimentation and decantation, sieving, filtration) E.g. Write one method of separation of mixture. 5. Define light E.g. What is light? 6. Define luminous and non-luminous objects E.g. What are luminous and non-luminous objects?	sedimentation and decantation, sieving, filtration) E.g. What is hand picking? 4.Differentiate between homogeneous and heterogeneous mixture E.g. Write any two differences between homogeneous and heterogeneous mixture. 5. Identify luminous and non-luminous objects and	4. Separate mixtures using common methods (handpicking, sedimentation and decantation, sieving, filtration, and explain this method. E.g. Which method do you apply to separate stone from rice? 5. Explain that white light is consists of seven colors. E.g. How many colors are separated from the white light	of grains for long time? 4. Explain the principle behind the separation of mixture (handpicking, sedimentation and decantation, sieving, filtration) E.g. Explain the principle of Filtration of water using filter paper. 5. Adopt good practices related to the use of sound. E.g. Write any two precautions need to be taken to follow the good sound practice in school premises.

S. N.	Learning Competencies	Unit/ Area	Learning Outcomes	Performance Standards			
				Below-Basic	Basic	Proficient	Advanced
			sedimentation and decantation), निफन्ने, चाल्ने, छान्नेको प्रयोग गरी मिश्रण छुट्याउन र व्याख्या गर्न To separate and explain the common methods of separating mixtures (hand picking, sedimentation and decantation, winnowing, filtering and sieving) ७.१ प्रकाशका विभिन्न स्रोतहरू पहिचान गर्न To identify different sources of light ७.२ दीप्त र अदीप्त वस्तुको परिभाषा दिन र त्यस्ता वस्तुहरू चिन्न To define luminous and non-luminous objects and identify such objects ७.३ पारदर्शी, अर्धपारदर्शी र अपारदर्शी वस्तु चिन्न र उपयोगिता बताउन To identify transparent, semi-transparent and opaque objects and state their utility.	7. Define sound. E.g. What is meant by sound? 8. Identify the various sources of light. E.g. Give examples of sources of light.	recognize such objects. E.g. Give examples of luminous and non-luminous objects. 6. Classify sound into soft and loud as well as dull and sharp sounds. E.g. A boy heard the sound of ringing bell and the same time he heard the sound of a cow. Which one is heard sharp among these two? 7. Mention the negative effects of louder noises. E.g. Write any two examples of	in the given figure?  6. Demonstrate the fact that light consists of seven colors. E.g. How do you demonstrate the fact that light consists of seven colors in a practical way? 7. Identify dull and sharp sounds as well as the conditions under which they are produced through.	6. Use a dry cell, switch, conducting wire, and torch bulb or LED to light a bulb and describe closed and open circuits based on this. E.g. Which of the given circuit will you use to glow a lamp? 

S. N.	Learning Competencies	Unit/ Area	Learning Outcomes	Performance Standards			
				Below-Basic	Basic	Proficient	Advanced
			७.४ प्रकाशमा सात रङहरू हुन्छन् भन्ने तथ्य प्रदर्शन गर्न To demonstrate the fact that light has seven colours. ७.५ ध्वनिलाई वस्तुको कम्पनबाट उत्पन्न हुने शक्तिका रूपमा उदाहरणसहित परिभाषित गर्न To define sound as a energy produced by the vibration of objects with examples. ७.६ ध्वनिका विभिन्न स्रोतहरू पहिचान गर्न To identify different sources of sound ७.७ ध्वनिलाई सानो र ठुलो तथा धोद्रो र तीक्ष्ण ध्वनिका रूपमा वर्गीकरण गर्न To classify sounds as soft and loud, hoarse and shrill ७.८ प्रयोगद्वारा धोद्रो र तीक्ष्ण ध्वनि तथा धोद्रो र तीक्ष्ण ध्वनि उत्पन्न हुने अवस्था पहिचान To identify the hoarse and shrill sound and condition of producing hoarse and shrill sound by experiments		negative effective of louder sound. 8. Explain the functions of wires, cells, bulbs, and switches in a circuit. E.g. Write any one role of A in the given electric circuit.  9. Give natural examples for separation of seven colour of white light. E.g. How is rainbow seen? 10. Identify transparent,	E.g. Identify which of the following sound is dull and which one is sharp among these two? i. sound of flute ii. sound of Madal 8. Follow safety measures to be taken while using electricity. E.g. Write any two examples of safety measures to be taken while using electricity.	

S. N.	Learning Competencies	Unit/ Area	Learning Outcomes	Performance Standards			
				Below-Basic	Basic	Proficient	Advanced
			७.९ चर्को आवाजका नकारात्मक असरहरू बताउन To explain the negative effects of loud noise ७.१० ध्वनि प्रयोगसम्बन्धी असल आचरण अवलम्बन गर्न To adopt good sound practice ७.११ ड्राइसेल, स्विच, सुचालक तार र टर्चको चिम वा LED प्रयोग गरी बत्ती बाल्न र यसका आधारमा बन्द र खुला परिपथ वर्णन गर्न To lit the bulb using dry cell, switch, conductive wire and bulb of torch or LED bulb ७.१२ परिपथमा तार, सेल, चिम र स्विचको कार्य बताउन To explain the working of wires, cells, bulbs and switches in a circuit ७.१३ विद्युत्को प्रयोग गर्दा अपनाउनुपर्ने सुरक्षाका उपायहरू अवलम्बन गर्न To adopt safety measures to be adopted while using electricity		translucent, and opaque objects and explain their uses. E.g. Which of the following would be best to use in the window of a house among zinc sheet, colourless glass, colour glass and thick colour plastic? 11. Identify the various sources of sound. E.g. Write any two sources of sound you hear every day. 12. Explain sound is produced by vibration of		

S. N.	Learning Competencies	Unit/ Area	Learning Outcomes	Performance Standards			
				Below-Basic	Basic	Proficient	Advanced
					objects, with examples. E.g. How is sound produced while playing a Madal?		
6	मौसम र प्राकृतिक बिपद्को आधारभूत जानकारी तथा सोअनुसारका अनुकूलनका उपायहरू अवलम्बन Basic knowledge of weather and natural disasters and adoption of adaptation measures accordingly पृथ्वीको बनोट तथा आकाशीय	पृथ्वी र अन्तरीक्ष Earth & Universe	८.१ आकाशमा सूर्य, पृथ्वी, चन्द्रमा र अन्य आकाशीय पिण्डहरू रहेको तथ्य बताउन To state the fact that there is sun, earth, moon and other celestial bodies in the sky ८.२ पृथ्वीले आफ्नो अक्षमा निरन्तर घुमिरहने प्रक्रिया प्रदर्शन गरी दिन र रात हुने कारण व्याख्या गर्न To explain the reason for day and night by demonstrating the constant rotation of the earth on its axis ८.३ पृथ्वीले सूर्यको वरिपरि र चन्द्रमाले पृथ्वीको वरिपरि परिक्रमा गर्ने प्रक्रिया उपयुक्त मोडेलद्वारा प्रदर्शन गर्न To demonstrate with a suitable model the process	1. State the fact that there is sun, earth, moon and other celestial bodies in the sky E.g., Give examples of celestial bodies E.g., What is a planet? 2. Define the different phases of the moon. E.g., What is a full moon?	1. Explain the reason for day and night by demonstrating the constant rotation of the Earth on its axis E.g., What causes days and nights on Earth? E.g., What are the causes of differentiation in the length of days and nights on Earth? 2. Explain the cause of the	1. Demonstrate with a suitable model the process by which the Earth revolves around the Sun and the Moon revolves around the Earth E.g., Draw a neat diagram of the Earth orbiting around the Sun and the Moon orbiting around the Earth	1. Describe the phases of moon pictorially by observing the changes in the shape of the moon E.g., What happens if the Earth's axis rotates perpendicular to the orbital plane without tilting? Explain with reasons. E.g., What would happen if there were a change in

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	पिण्डहरूको सामान्य जानकारी General information about the structure of the earth and celestial bodies.		by which the Earth revolves around the Sun and the Moon revolves around the Earth ८.४ चन्द्रमाको आकारमा आउने परिवर्तनहरूको अवलोकन गरी चन्द्रमाको कला सचित्र वर्णन गर्न To describe the phases of moon pictorially by observing the changes in the shape of the moon		changing shape of the moon E.g., What causes the phases of the moon?	2. Demonstrate the phases of the moon E.g., Draw the picture of the phases of the moon	the shape of the moon every day?

Table of Specification Grid

Unit	Content Domain	Working hour	Weightage percentage	Total domain marks	No. of SR Items	Marks	No. of CR items	Marks
Scientific learning	Physical Science and ICT	10	59	24	12	12	6 to 8	12
Information, Communication and Technology		30						
Matter		30						
Energy in Daily Life		25						
Organism and Environment	Life Science	10	28	11	5	5	3 to 6	6
Classification of Living Beings		20						
Life Process		15						
The Earth and Space	Earth Science	20	13	5	3	3	2 to 3	2
Total			**100**	**40**	**20**	**20**		**20**

Remarks

- For selective response-SR (MCQ), one question covers one mark. For Constructed Response-CR, one item covers one/two marks
- The weightage of items in each set should be around as following proportion of proficiency and cognitive levels:

Weightage for SR + CR item	Weightage for items of various standards	Weightage for each item to each cognitive level
The weightage of items in each content domain should be around as SR- 50% and CR - 50%	The weightage of items in each set should be around as follows: Below-basic: 15% Basic: 35% Proficient: 35% Advance: 15%	Remembering: 20% Understanding: 30% Applying: 30% Higher ability: 20%

Sample Question Set

Grade: 5 **Subject: Science and Technology** **Time: 2 hrs**

समूह (Group): A **20 × 1 = 20**

तलका प्रश्नका सही विकल्पमा ठिक चिह्न ९√० लगाउनुहोस् । Tick (√) the correct option of the following questions.

1. अवलोकनबाट मात्र थाहा पाउन नसकिने वस्तुको गुण कुन हो? (Which property of an object can NOT be found by observation?) [K]

(a) स्वाद (Taste)

(b) खस्रोपना (Roughness)

(c) तातोपना (Hotness)

(d) बल्ने गुण (Burning property)

2. तलका मध्ये कुन काम वैज्ञानिक सिकाइ प्रक्रियाअन्तर्गत पर्छ? (Which of the following work comes under the scientific learning process?) [U]

(a) अवलोकन, प्रयोग र सोधखोज गरी नयाँ कुरा पत्ता लगाउनु (Discover new things by observation, experiment and inquiry)

(b) विज्ञान किताब र स्रोत सामग्री अध्ययन गर्नु (Study science books and resources)

(c) तोकिएको काम राम्रोसँग गर्नु (Perform assigned tasks properly)

(d) वैज्ञानिकले भनेअनुसार कार्य गर्नु (Do work as per the scientist's instructions)

3. तलका दिइएका क्रियाकलापमध्ये अन्तरवैयक्तिक सञ्चारको उदाहरण कुन हुन्? (Which one of the following activities is the example of interpersonal communication?) [HA]

(a) बिनुले किताब पढ्नु र विवेकले एक जना साथीसँग कुरा गर्नु

(Reading a book by Binu and talking to Vivek with a friend)

(b) बिनुले किताब पढ्नु र विवेकले धेरै जना साथीसँग कुरा गर्नु

(Reeding book by Binu and talking Vivek with many friends)

(c) बिनुले आमासँग कुरा गर्नु र विवेकले साथीसँग कुरा गर्नु

(Talking Binu with her mother and talking Vivek with friends)

(d) बुबाले रेडियो सुन्नु र आमाले छोराको हालखबर सोध्नु

(Tuning radio by Father and asking health condition of the son by mother)

4. कम्प्युटरको कुन भागलाई यसको मस्तिष्क भनिन्छ? Which part of computer is known as its brain? [K]

(a) मोनिटर (Monitor) (b) हार्डडिस्क (Hard disk) (c) सि.पि.यु.(C.P.U) (d) माउस (Mouse)

5 दिइएको तालिका अध्ययन गर्नुहोस् र सही जोडाको पहिचान गर्नुहोस् । Study the given table and identify the correct pair: [HA]

(a) P-b, Q-a, R-c

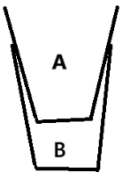
(b) P-b, Q-c, R- a

(c) P-a, Q-c, R-b

(d) P-a, Q-b, R-c

महल A (Column A)	**महल B (Column B)**
P. आकार र आयतन निश्चित भएको Has fixed shape and fixed volume	a. तरल liquid
Q. आकार र आयतन निश्चित नभएको Has no fixed shape and has no fixed volume	b. ठोस solid
R. आयतन निश्चित भएको तर खाँद्र नसक्ने Has fixed volume but cannot be compressed	c. ग्यास gas

6. रमिताले भण्डारण गरी राखेका काँचका गिलासहरू चित्रमा जस्तै अड्केको पाइन् । तिनले ती गिलासहरूलाई छुट्याउन सकिनन् । उक्त गिलासलाई छुट्याउनका लागि तिनले के गर्नुपर्ने थियो ? Ramita found two of the stored glass tumblers fastened as shown in the diagram. She could not separate these glasses. What would she do to separate the glass tumblers? [HA]



(a) गिलास A मा चिसोपानी हाल्नुपर्ने cold water should be poured in tumbler A

(b) गिलास B मा चिसोपानी राख्नुपर्ने tumbler B should be kept in cold water

(c) गिलास A मा तातोपानी हाल्नुपर्ने hot water should be poured in tumbler A

(d) गिलास A र B दुबैलाई तातोपानीमा डुबाउनुपर्ने tumbler A and B both should be immersed in hot water

7. दिइएको मध्ये तरल र तरलको मिश्रण कुन हो?

Which of the given mixture is of liquid and liquid?

(a) नुन र पानी salt and water

(b) माटो र बालुवा soil and sand

(c) सोडापानी soda water

(d) दुध र पानी milk and water

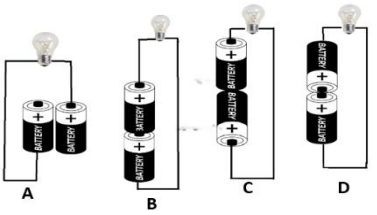
8. तपाईंले बत्ती बाल्नका लागि दिएका मध्ये कुन जडानको प्रयोग गर्नुहुन्छ ? Which of the given circuit will you use to glow a lamp? [A]

(a) A

(b) B

(c) C

(d) D



9. तल दिएका मध्ये कुनले प्रकाशलाई आंशिक रूपमा मात्र छिर्न दिन्छ ? Which of the following allows light to pass in partially? [U]

(a) स्टिल प्लेट steel plate

(b) हिले पानी muddy water

(c) तेलले भिजेको कागज oiled paper

(d) कालो कागज Black paper

10. तपाईंले " Shift key" नथिचिकनै अङ्ग्रेजीको Capital Letter टाइप गर्नुपरेको छ भने कुन key को प्रयोग गर्नुहुन्छ ? If you have to type capital letter without holding down the "shift key", Which key do you use ? [A]

(a) Caps lock (b) Enter (c) Space bar (d) Back space

11. बिरूवाले खाना बनाउँदा हावाबाट कुन ग्यास सोसेर लिन्छ ? Which gas does the plant absorb from air while preparing food? [K]

(a) अक्सिजन Oxygen

(b) कार्बन डाइअक्साइड Carbon dioxide

(c) नाइट्रोजन Nitrogen

(d) हाइड्रोजन Hydrogen

12 चित्रमा देखाए जस्तो प्लास्टिकको टनेलभित्र गोलभेंडा खेती गर्दा जाडोयाममा पनि धेरै गोलभेंडा उत्पादन गर्न सकिन्छ, कसरी? More tomatoes can be grown even in winter, if tomatoes are cultivated in plastic tunnel as shown in the figure, how? [U]

(a) टनेलभित्र तापक्रम बढने हुनाले Due to increase in temperature inside the tunnel

(b) टनेलभित्र प्रकाश छिर्न नपाउनाले Due to blockage of sunlight into the tunnel

(c) टनेलभित्र हावा आवतजावत नहुनाले Due to the lack of air circulation in the tunnel

(d) टनेलले बिरूवालाई रोगबाट बचाउँनाले due to protection of the plants from diseases

13. भ्यागुतोलाई किन उभयचर समूहमा राखिएको हो? Why is frog kept in group Amphibia? [U]

(a) भ्यागुतो पानीमा बस्ने भएकाले As frog lives in water.

(b) भ्यागुतो फोक्सोले सास फेर्ने भएकाले As frog respires through lung

(c) भ्यागुतो पानी र जमिन दुवैमा बस्ने भएकाले As frog live in both water and land.

(d) भ्यागुतो चार खुट्टाले हिँड्ने हुनाले As frog moves using four limbs.

14. एउटा फूलको स्त्रीकेसर हटाउँदा बिरूवामा कुन भागको विकास हुँदैन? Which part of the plant will not be formed if gynoecium of flower if taken out from a flower? [U]

(a) पात Leaf

(b) फूल Flower

(c) काण्ड Stem

(d) बिउ Seed

15. फूलका भागहरूलाई बाहिरबाट भित्र मिलाएर राख्दा कुन क्रम सही हो? Which sequence is correct while arranging parts of flower from outer to inner part? [K]

(a) स्त्रीकेसर, पुष्पदल, पत्रदल, पुङ्केसर Gynoecium, corolla, calyx, androecium

(b) पुष्पदल, स्त्रीकेसर, पत्रदल, पुङ्केसर Corolla, gynoecium, calyx, androecium

(c) पत्रदल, पुष्पदल, पुङ्केसर, स्त्रीकेसर Calyx, corolla, androecium, gynoecium

(d) पुष्पदल, पत्रदल, पुङ्केसर, स्त्रीकेसर Corolla, calyx, androecium, gynoecium

16. बिरुवाले श्वासप्रश्वास गर्दा के गर्छ? What do plants do during respiration? [K]

(a) अक्सिजन लिने र पानीको वाफ फाल्ने inhaling oxygen and throwing water vapour

(b) अक्सिजन लिने र कार्बन डाइअक्साइड फाल्ने Inaling oxygen and throwing carbon dioxide

(c) कार्बन डाइअक्साइड लिने र अक्सिजन फाल्ने inhaling carbon dioxide and throwing oxygen

(d) कार्बन डाइअक्साइड लिने र पानीको वाफ फाल्ने inhaling carbon dioxide and throwing water vapour

17. मानिसको शरीरबाट पसिना निस्कनु कुन जीवन प्रक्रिया हो? Which life process is the sweating from human body? [K]

(a) निस्कासन Excretion

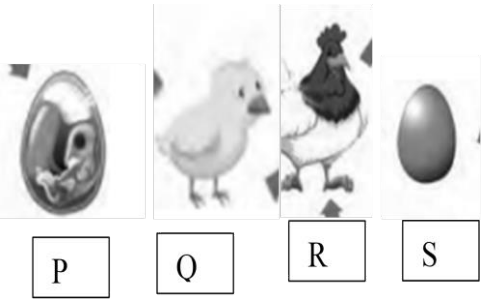
(b) परिवहन Transportation

(c) श्वासप्रश्वास Respiration

(d) पोषण प्रक्रिया Nutrition

18. चित्रमा दिएको जीवन प्रक्रियाको सही क्रम कुन हो? Which is the correct order of life cycle given in figure? [K]

(a) PQRS
(b) RQPS
(c) QPRS
(d) SPQR



19. पृथ्वीमा दिन र रात हुनुको कारण तलका मध्ये कुन हो? Which of the following is the cause of occurring day and night on the earth? [U]

(a) सूर्य आफ्नो अक्षमा घुम्ने हुनाले (By rotating the sun on its axis)

(b) पृथ्वी आफ्नो अक्षमा घुम्ने हुनाले (By rotating the earth on its axis)

(c) पृथ्वी सूर्यको परिक्रमा गर्ने हुनाले (By revolving the earth around the sun)

(d) चन्द्रमाले पृथ्वीको परिक्रमा गर्ने हुनाले (By revolving the moon around the earth)

20. दिइएको तालिकामा महल A मा ग्रह र महल B मा उपग्रहको सङ्ख्या दिइएका छन् । त्यसका आधारमा सही जोडाको पहिचान गर्नुहोस्। Study the given table and identify the correct matching: [K]

(a) P-b, Q-a, R-d, S-c
(b) P-d, Q-c, R-b, S-a
(c) P-b, Q-d, R-a, S-c
(d) P-d, Q-a, R-b, S-c

महल A (Column A)	**महल B (Column B)**
P. बुध Mercury	a. 1
Q. पृथ्वी Earth	b. 67
R. बृहस्पतिJupiter	c. 14
S. वरुण Neptune	d. 0

समूह (Group) B

तलका प्रश्नको उत्तर दिनुहोस्। Write the answer of following questions.

21. नम्रताले फलफूल पसलमा एउटा मेवा किन्न भनेर तराजुको सहायताबाट जोख्दा २१०० ग्राम पाइन् । उक्त मेवाको पिण्ड किलोग्राममा निकाल्नुहोस् ।

Namrata weighed a papaya in a fruit shop and found it to be 2100 g. Find the mass of the papaya in Kilograms. [1A]

22. मेजरिङ सिलिन्डर केको लागि प्रयोग गरिन्छ? What purpose a measuring cylinder is used for? [1K]

23. सञ्चारको कुनै एउटा साधनको नाम लेख्नुहोस्। Write any one means of communication. [1K]

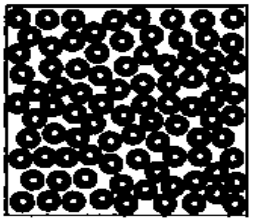
24. मानिस र कम्प्युटरबिच प्रमुख फरक लेख्नुहोस्। Write a major difference between Human and Computer. [1U]

मानिस Human	कम्प्युटर Computer

25 शिक्षकले कक्षाका सबै विद्यार्थीहरूलाई तपाईंको परिकल्पनाको विद्यालय कस्तो छ, कम्प्युटरमा चित्र बनाएर देखाउनुहोस् भन्ने निर्देशन दिनुभयो । निर्देशन पाएपछि अरू सबै विद्यार्थीहरू आआफ्नो परिकल्पनाको विद्यालयलाई चित्रमा ढाल्ने प्रयासमा लागे तर साधनलाई उक्त काम कुन कम्प्युटर सफ्टवेयरको प्रयोगबाट गर्न सकिन्छ भन्नेमा द्विधा भयो । यस्तो अवस्थामा साधनलाई कुन सफ्टवेयर प्रयोग गर्न सुझाव दिनुहुन्छ? The teacher instructed all the students in a class to show how the school of your imagination is versed on the computer. All the students try to draw pictures of their imagination, but there is confusion for Sadhana to choose the computer software? Which software would you suggest for Sadhana in such situation? [1 HA]

26. तपाईंलाई बालुवा, चकको धुलो र पानीको मिश्रणबाट तीनओटा अवयवलाई छुट्याउनु छ भने दुई चरणमा कसरी छुट्याउनुहुन्छ ? If you have to separate all the three components from a mixture of sand, chalk powder and water, how will you separate them in two steps? [2A]

27. चित्रमा कुन अवस्थाको पदार्थ देखाइएको छ? Which state of matter is shown in the given diagram? [1K]



28. मन्दिरको घन्टीलाई घरमा बजाइने घन्टीभन्दा ठुलो किन बनाइएको हुन्छ? एउटा मात्र कारण लेख्नुहोस् । Why the bell of temple is made bigger than the bell used to ring at home? Give only one reason. [1U]

29. सिजनको घरमा बढी क्षमताको विद्युत उपकरण जोड्नका लागि सकेटहरू निकै कम उचाइमा रहेका छन्। तिनको एक वर्षको भाइ कोठामा जताजतै पुगेको हुन्छ। यस अवस्थामा निम्न प्रश्नका उत्तर लेख्नुहोस्? In Sijan's house sockets to connect high power electrical apparatus are at very low height. His one-year-old brother moves every where in the room. Answer the following questions on the basis of it: [2U]

i) यस अवस्थामा भाइको कुन क्रियाकलापको कारणले विद्युतीय दुर्घटना हुन सक्ने सम्भावना छ? In this condition due to which of the brother's activity there is possibility of electrical accident? [1]

ii) यस्तो दुर्घटना हुन नदिनका लागि सुरक्षाको एउटा उपाय लेख्नुहोस् । Mention any one safety measure can be adopted to avoid such accident. [1]

30. जाडोयाममा भन्दा गर्मीयाममा बिरूवाहरू छिटो हुर्कनुको कारण के हो? What is the reason for growing plants faster during summer than in winter? [1U]

31. चमेली रातिमा फुल्छ तर टुलिप बिहान फुल्छ । यस्तो किन हुन्छ? Jasmine blooms during night but tulip blooms in the morning. Why does this happen? [1HA]

32. बिरूवाको कुन भागमा खाना बन्छ? In which part of plant food is prepared? [1K]

33. डुङ्गा आकारको शरीर हुने, हलुका हाड हुने, फोक्सोले सास फेर्ने जनावरले बच्चा कसरी उत्पादन गर्छ? How does an animal produce baby which has boat-shaped body, light bone and respire through lungs? [1A]

34. चमेरो र परेवा दुबै पखेटाको सहायताले उड्छन्, फोक्सोले सास फेर्छन् तर यिनीहरूलाई फरक समूहमा किन राखिएको हो? Bat and pigeon both fly with the help of wings, respire with lungs but why are these kept in different groups? [1HA]

35. बिरामीलाई सलाइनबाट औषधी दिँदा कुन जीवन प्रक्रिया प्रयोग हुन्छ? Which life process is used while providing medicine through saline? [1U]

36. प्रकाश संश्लेषण र श्वासप्रश्वास प्रक्रिया एक अर्कामा निर्भर हुन्छन् । यस भनाइलाई एउटा कारणसहित स्पष्ट पार्नुहोस् । Photosynthesis and respiration are interdependent life process. Justify with one reason. [1U]

37. आज चन्द्रमाका पूरै भाग कालो हुन्छ र यसलाई पृथ्वीबाट देख्न सकिँदैन भने आज चन्द्रमाको कलाक कुन दिन हो? Today the moon is completely dark and if it cannot be seen from the earth, what day of the phase of the moon is today? [1U]

38. पृथ्वीमा जस्तै अन्य ग्रहमा के भएको भए सजीवहरू रहन सम्भव हुन्थ्यो होला? कुनै एउटा अवस्था लेख्नुहोस् । What would make it possible for the existence of life in other planets as in the Earth? Mention any one condition. [1U]

Scoring Guideline

Selective Response Item

Item Term	Key Answer
1	d
2	a
3	c
4	c
5	b
6	a
7	d

Item Term	Key Answer
8	b
9	c
10	a
11	b
12	a
13	c
14	d

Item Term	Key Answer
15	c
16	b
17	a
18	d
19	b
20	d

Constructive Response Item

21. 2100 gm/ 1000 = 2.1 kg — 1 mark
22. To find volume of irregular object — 1 mark
23. Radio/ Television/ Mobile Phone — 1 mark
24. 1 mark for one correct difference.

Human	Computer
Can do self-decision	Cannot do self-decision
Have creativity	Don't have crativity

25. Paint software 1 mark
26. i) Sand will be separated by decantation process. 1 mark
    ii) Chalk and water will be separated by filtration process. 1 mark
27. liquid 1 mark
28. To increase the loudness of sound 1 mark
29. i) the brother can insert his finger or any metallic article in the holes of the socket and it will be cause of electric shock 1 mark
    ii) The holes should be covered by using adhesive tape. 1 mark
30. Due to the presence of suitable temperatures for the growth of plants during summer.
31. Jasmine needs a low temperature (less heat) to glow but Tulip needs more temperature (more heat) to glow. 1 mark
32. Leaf 1 mark
33. It produces babies by laying eggs. 1 mark
34. Bat gives direct birth but pigeons lay eggs.

    Or

    Bat is viviparous but pigeon is oviparous. 1 mark
35. Transportation or internal transportation 1 mark
36. During photosynthesis plants take carbon dioxide exhaled by living organisms and throw oxygen. That oxygen is taken by living organisms during respiration. Therefore these two life processes are interdependent. 1 mark
37. New Moon Day 1 mark
38. Presence of water/ presence of air/ Suitable temperature 1 mark

Chapter 3

Methodological Framework for Assessment

3.1 Introduction

The NASA 2025 assessment framework for grade five is designed and developed to assess the students' achievement in Nepali, English, Mathematics and Science by using the item response theory (IRT) model. IRT models are developed to measure the latent ability which is unobservable and cannot be studied directly by classical test theory. IRT is also useful for the calibration of test items and equating the scores for the analysis of the performance of students. The methodological framework consists of all the methods and procedures that should be adopted during the assessment process. In particular, it includes sample design, sample size determination, tools development (background variables and test items preparation) procedure, piloting procedure, test booklet preparation, test administration and supervision procedures, scoring and data preparation, data analysis procedures and reporting and dissemination procedure.

3.2 Sample Design

NASA 2025 not only assesses the student's achievement in different subjects but also analyzes the interrelationship with other connected activities. Therefore, the school is the primary sampling unit for NASA studies. To make a representative sample stratified random sampling procedure will be adopted in different stages. To make the sample representative, at first, two major strata of ecological zones (Mountain, Hill and Terai) and seven provinces will be considered and then respective districts will be grouped into each stratum. Secondly, school types (community and institutional) and school location (rural and urban) will be considered as sub-strata within each district.

Probability Proportional to Size (PPS) Sampling: PPS sampling will be used to select the schools of varying size, which ensure schools with a higher number of students have a greater probability of selection (Cheung, 2014). By utilizing PPS, the sample is better aligned with the true distribution of students across various schools, increasing the likelihood that the results can be generalized to the entire population (Cheung, 2014; Kalton, 2021).

Simple Random Sampling within Schools: In order to ensure that all individuals in the population have the same probability of selection irrespective of the size of their school (cluster), the same number of students will be sampled from each cluster. In NASA 2025, 25/27 students from each sampled school will be selected randomly from grade five and when there are 25/27 or fewer students in grade five, all the students will be included in the sample so that each student in the population has the same probability of being sampled. But the schools having fewer than 10 students in grade five will be excluded from the sampling unit.

3.3 Sample Size Determination

In NASA 2024, the actual sample size will be calculated using multistage sampling methods. Intra-class correlation, school cluster size, design effect, and effective sample size will be determined before the calculation of the clustered sample size. The effective sample size of a simple random sample will be 384 students for the main criterion variable as suggested by Cohen et al. (2007) which yields a 95% confidence interval. But the perfect random sampling is not an easy task for such a large-scale national assessment involving multistage sampling. So, the design effect will be calculated and adjusted while selecting the sample size. The actual sample size will be calculated based on the latest official list of schools. The needed data will be taken from the help of EMIS record of different schools.

3.4 Tools Development

NASA 2025 will develop two types of assessment tools: a background information questionnaire for students, teachers and head teachers and subject-specific test items. To develop the background information questionnaire the team of experts will review the national and international practices and draft the questionnaire and ERO will organize a series of workshops with concerned stakeholders to finalize the background information questionnaire. A separate workshop will be conducted in order to pare the subject-specific test items.

First, the team of subject experts will define the content domain based on the curricular goals and expected competencies. In particular, four levels of questions, remembering, understanding, applying and higher-order thinking (reasoning) will be developed based on the revised Bloom's taxonomy (Anderson & Krathwohl, 2001). Based on the four levels of cognitive domain and the subject matter included in the test item, the performance of students will be categorized into four standards: Below-basic, Basic, Proficient and Advanced. A specification table will be created to outline the types and difficulty levels of questions from each content domain with proficiency standards. A team of item writers initially drafts a large number of test items and stores them in an item bank. After that, a team of experts selects the most suitable items from the bank and these selections are ultimately finalized by a subject-specific committee. Altogether, six sets of test papers will be prepared for the piloting, and after the item analysis, three sets will be finalized for the administration.

3.5 Piloting and revision

A pilot study will be conducted among the students of different schools. The selection of schools will be representative of the geographical locations and types. The prepared six sets of test papers will be piloted among the selected students. Different schools will be selected for the piloting of different subjects' test papers. Orientation sessions will be organized for the participants to conduct the pre-test, coordinate the collection of test papers, and score and tabulate the scores. The CTT/IRT model will be used for item analysis using two-parameter logistic models where items vary in their difficulty and discrimination. The following major criteria will be considered to prepare the three sets of test papers for the final test:

1. The test items align with the curricular objectives.
2. The items of the test paper maintain the content validity.
3. The items represent different cognitive levels according to Bloom's revised taxonomy, as mentioned in the subject-specific framework.
4. The items measure various levels of standards from below basic to advanced.
5. The test items have an appropriate difficulty level and discrimination power.
6. For selected response (MCQ) items, the power of distractors will also be analyzed and revised as needed.

3.6 Preparation of Test Booklets

After the item analysis, the test items will be selected and managed in three different sets. Before making the booklets of test items, anchored items will be finalized. The anchored items are those items that are taken from the previous test. The items that have appropriate difficulty and discrimination parameters will be used as anchored items and these items are common test items for all three sets. At least, 20% items will be taken as the anchored item in each set. Three sets will be equated by using IRT modeling so that the test scores of the students in various sets can be compared. For this purpose, 50% of the items of set 1 will be included in set 2 and set 3 will contain 50% items from set 1 and 50% the items from set 2.

3.7 Test Administration

The overall administration of the test in each district will be conducted under the coordination with ERO and EDCU (Educational Development Center Unit). Based on the NASA guidelines, ERO expert teams will give orientation to EDCU staff. This orientation will encompass the test administration procedures, maintaining standardization and fairness, and verifying sample schools and student numbers as well as the selection of a TA (Test Administrator). A one-day orientation for TAs will be organized by each district office (EDCU). The Test Administrator will be responsible for administering the test papers in respective schools simultaneously across the country, under the supervision and monitoring of representatives from the EDCU and ERO. All three versions of the tests will be administered in each school, with each student receiving a different set alternately.

Scoring and data preparation

An expert team will develop the scoring guideline, including answer key and marking scheme of each subject before scoring the students' responses. Before starting to check the answer sheet, an orientation for the teacher will give about scoring rubrics and marking procedures.

3.8 Data analysis procedure

The data analysis involves the following steps or phases:

Data cleaning: When the data entry process is end, ERO developed the database and a team of experts first cleans the data from the test of each subject. Then, the data will be verified for erroneous and/or missing data. In this process, the background variables and items will be recorded carefully by creating other indicators for analysis purposes.

Preparation of database: For the Item Response Theory (IRT) analysis, appropriate software such as ConQuest, MS Excel, STATA, and SPSS will be employed to prepare the database and analyze the results. Initially, data will be processed and analyzed using Excel and SPSS. During the preliminary analysis phase, the items' rest correlations will be calculated, and Item Characteristic Curves (ICCs) will be generated using the One-Parameter Logistic Model (PLM) and the Partial Credit Model (PCM) of IRT.

Equating Students' Scores and Latent Ability: At this stage, ability scores (theta) will be computed, and the equating of three versions of students' scores in each subject along with latent ability (theta) will be performed. The equated data will be integrated into the original SPSS file to create a comprehensive database. This process will involve merging each version of students' test scores with the background variables of all respondents (students, teachers, and head teachers) to prepare an SPSS database for analysis.

Data Fit Verification: Prior to data analysis, relevant parameters will be calculated, and item fit will be evaluated by plotting ICCs using the Two-Parameter Model (2PM) and the Partial Credit Model (PCM) of IRT. The use of PCM is essential due to the presence of both Selected Response (SR) and Constructed Response (CR) items in the test.

Proficiency Level Determination: Various methods will be considered for calculating cut scores, with appropriate techniques such as the paneling method, bookmark method (refer to Cizek & Bunch, 2007), and the Item Descriptor Matching (ID matching) method (see Ferrara, 2012; Cizek & Bunch, 2012). ERO has conducted NASA of grade 5 in 2022. The proficiency level of four subjects Nepali, English, Mathematics, Science and Technology will be used for the NASA 2025.

Calculation and Analysis: At this stage, a range of statistical results will be computed, analyzed, and interpreted. Basic statistical methods for analyzing assessment results will include descriptive statistics (mean, standard deviation, percentage and frequency), inferential statistics (t-test, ANOVA, and chi-square test) and relational statistics (correlation and regression analysis).

Reporting and Dissemination: The processes of data analysis and report preparation will be conducted simultaneously. A team of content editors will collaborate with the statistician to draft and finalize the report. A series of workshops will be organized to analyze the data and prepare the report. The draft report will undergo peer review by subject and assessment experts, with their feedback incorporated into the revised version. The final report will be proofread by a language editor and published on the Education Review Office's (ERO) website as well as in print. The findings will be disseminated through national and regional workshops and press releases.

Chapter 4

Identification of Contextual Variables

4.1 Introduction

Education Review Office (ERO) uses standardized tests to obtain data on students' learning achievement in a particular grade. Learning doesn't happen in a vacuum. Numerous factors in students' daily lives affect how they learn, from their classes at school to their activities outside of school, to their interactions with their families at home. Without considering students' backgrounds, the analysis of their achievements in tests will not be sufficient. Owing to this fact, NASA collects relevant information through questionnaires about the contexts associated with differences in students' achievement.

NASA needs to develop questionnaires to elicit information related to various factors that affect students' performance implicitly and explicitly. Thus, this chapter analyses different national and international practices to gather information about the key contextual variables that are relevant and useful in national assessments of Grade 5.

4.2 A Review of Contextual Variables: International and National Practices

It is vital to know the variables that are associated with learners' achievement while carrying out large-scale assessments like NASA. These factors should help explain the differences in the level of students' performance. For this, the questionnaires should include specific contextual variables because a good questionnaire helps to collect multiple information that are related to students themselves, parents, schools, and head teachers. Different practices suggest that such contextual variables will be different for students, parents, schools, and head teachers, too. In this section, the variables used in different testing practices are presented.

Anderson and Morgan (2008, pp. 103-105), suggest the following contextual variables for national assessment.

Student Questionnaires

- Gender, age, and language background (all usually collected on the front of the test booklet)
- Educational background, such as years at school and periods away from school
- Opportunities to attend school
- Expectations of success and personal or family attitudes about the value of school
- Perceptions of classroom environments, such as a sense of safety, friendliness of other students, or support from teachers
- Teacher's time on task
- Leisure period
- Extra/co-curricular activities

Parent Questionnaires

- Nationality, gender, and language background
- Home environment, such as access to books, desks, and lights
- Family background, such as the education of parents and the language spoken at home
- Attitudes toward education, such as commitment to sending children to school, perceptions of the value and relevance of education, or perceptions of the quality of education
- Attention to homework and study resources provided at home for children
- Affordability and accessibility of education for children
- Expectations of educational achievement for children
- Involvement with schools, such as participation in the classroom or on committees
- Nature of school reports about children's progress and their value
- Financial support for the school in the form of payment for textbooks and fees

Teacher Questionnaires

- Gender and age
- First language
- Teaching conditions, such as class size, access to resources, percentage of students who have textbooks, access to replacement teachers when sick, and assistance with challenging students
- Educational experience, teacher qualifications, and number of years in this school
- Professional engagement with learning, such as access to and interest in professional development, interest in teaching, and time spent preparing for classes
- Availability of instructional support through classroom visits by head teachers, school inspectors, or supervisors
- Teaching methodology, such as language of instruction, use of assessment, and style of teaching
- Satisfaction with working conditions, such as tenure, rates of pay, and level of supervision
- Relationships with the school community, such as interactions with parents, involvement in school committees, and participation in local community events
- Distance from the teacher's home to school
- Use of ICT

Head-Teacher Questionnaires

- Gender and age
- Educational and management experience and qualifications
- School environment, such as quality of buildings and facilities, as well as availability of resources

- School records, such as fluctuations in student numbers, the extent of student or teacher absenteeism, and the frequency of students changing schools
- Professional engagement with school leadership, such as access to and interest in professional development and interest in education
- Leadership style and use of time
- Satisfaction with working conditions, such as tenure, rates of pay, and level and frequency of supervision
- Relationship with the school community, such as interactions with parents and participation in local community events.

The major international assessments, such as PISA and TIMSS have included a good set of contextual variables in their respective tests. The PISA questionnaire framework (OECD, 2016, p. 17), for example, has the following contextual variables:

- Students and their family backgrounds, including their economic, social and cultural capital
- Aspects of students' lives, such as their attitudes towards learning, their habits and life in and outside of school, and their family environment.
- Aspects of schools, such as the quality of the schools' human and material resources, public and private management and funding, decision-making processes, staffing practices and the school's curricular emphasis and extracurricular activities offered.
- Context of instruction, including institutional structures and types, class size, classroom and school climate, and science activities in class.
- Aspects of learning, including students' interest, motivation and engagement.

In addition, the 2015 PISA framework includes the following contextual factors (OECD, 2016, p.17):

- A computer familiarity questionnaire, focused on the availability and use of information and communications technology (ICT) and on students' ability to carry out computer tasks and their attitudes towards computer use.
- An educational career questionnaire, which collects additional information on interruptions in schooling, on preparation for students' future careers, and support with science learning.
- A parent questionnaire, focusing on parents' perceptions of and involvement in their child's school, their support for learning at home, school choice, their child's career expectations, and their background (immigrant/non-immigrant).
- A teacher questionnaire, which is new to PISA, will help illustrate the similarities and differences between groups of teachers in order to better establish the context for students' test results. Science teachers, for example, are asked to describe their teaching practices through a parallel questionnaire that also focuses on teacher-directed teaching and learning activities in science lessons and a selected set of inquiry-based activities.

The teacher questionnaire asks about the content of a school's science curriculum and how it is communicated to parents too. The new optional teacher questionnaire gathers information on transformational leadership as well. Similarly, the 2015 TIMSS framework also includes such contextual factors in its test. The following contextual variables are included in the 2015 TIMSS framework (Mullis & Martin, 2013).

- National and community contexts (which include economic resources, population demographics, and geographic characteristics; organization and structure of the educational system; student flow; languages of instruction; intended mathematics and science curriculum; teachers and teacher education; monitoring curriculum implementation)
- Home contexts (Home resources for learning, languages spoken in the home, parental educational expectations and academic socialization; early literacy, numeracy, and science activities)
- School contexts (school location, school composition by student socio-economic background, instruction affected by mathematics and science resource shortages; teacher availability and retention; principal leadership; school emphasis on academic success; and safe, orderly, and disciplined school)
- Classroom contexts (teacher preparation and experience, TIMSS mathematics and science topics taught, classroom instructional resources and technology; instructional time, instructional engagement; and classroom assessment)
- Student characteristics and attitudes toward learning (student readiness to learn, student motivation, student self-concept, and student characteristics).

The previous NASA studies in Nepal (2013, 2015a, 2015b, 2016) have also included many contextual variables related to teacher, head teacher and student questionnaires. Like the previous NASA studies, the NASA 2025 (Grade 5) study has set out a conceptual framework that depicts the key variables that are associated with students' level of learning.

4.3 A Conceptual Framework for the Background Information for NASA 2025

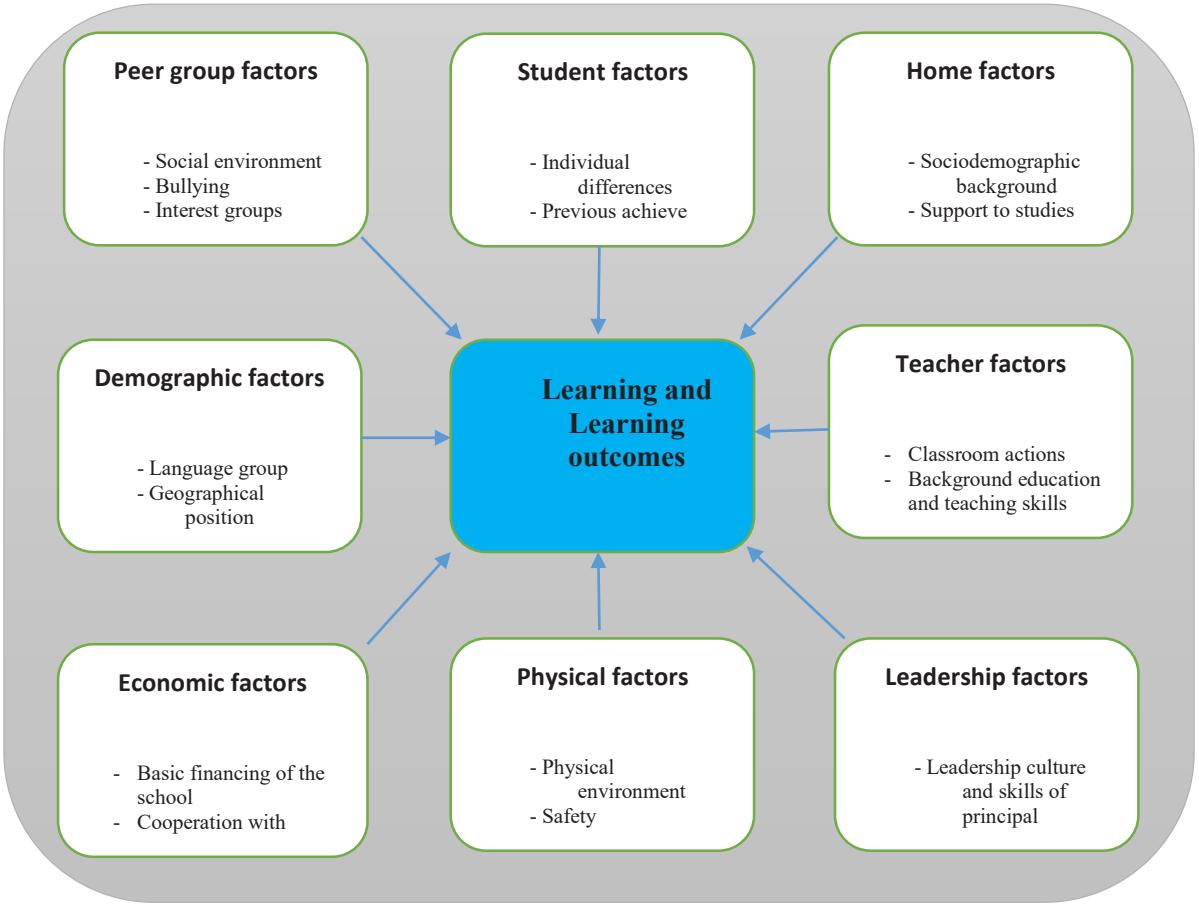
The conceptual framework that includes the contextual factors and variables associated with the learning achievement of students for NASA 2025 for Grade 5 is shown in Figure 5.1. This framework is an adapted version of the Finnish National Education Board of Education (Metsämuuronen, 2009) and the previous NASA studies (2013, 2015a, 2015b, 2016, 2018 and 2022). This framework provides a theoretical basis for preparing the background questionnaire for students, teachers and head teachers. The key idea of this model is that learning outcomes of students are closely associated with various factors—the factors related to the students themselves, their peer groups, home environment, teachers and physical facilities both at school and home, and school leadership.

As presented in figure, the student background questionnaire includes the information related to students' individual factors, home or family factors, and peer group factors. The **students'**

factors are the most crucial factors that influence the level of student learning. Such factors may include their sex, ethnicity, interest, level of motivation, individual differences in learning habits and style, previous achievement level, and support system for children with special needs. The **home or family factors**, which are equally important in shaping student learning, include SES, support for the studies of children, literacy in the family, and so on. The **peer group factors** are associated with the characteristics of students' close peers, including social support, bullying, classroom environment and interest groups.

The teacher questionnaire includes the variables associated with the **teacher factors,** such as teachers' experience of teaching, teaching skills, classroom activities, and use of teaching materials. In addition to the teacher factors, there are school-related factors that are divided into **managerial** and **physical factors**. The managerial factors include the head teacher's leadership and managerial skills and accomplishments. The managerial aspect also includes the school's ethos and missions, including the school academic atmosphere and culture. Likewise, the physical factors include the physical facilities and standards of the school including the school building, classrooms, furniture, playground, canteen, toilets, safety, and others. The head teacher questionnaire includes questions related to the managerial and physical factors.

The **demographic factors**, which are part of the sampling scheme, are related to the students' ethnicity, language, and physical location. The **economic factors**, on the other hand, include the financing of the schools and other monetary contributions to the schools. These two factors – demographic and economic – are available in national statistics, so are not part of student, teacher, and head teacher questionnaires.



(ERO, 2013, 2015a, 2015b, 2016, 2018, 2022)

Figure 3: Conceptual framework for developing questionnaires to collect background information

Student questionnaires

Based on the above framework, NASA 2025 (Grade 5) will use a student questionnaire which includes items to solicit students' individual demographic information such as ethnicity, language, time taken from home to school, use of leisure time in school, supporting learning in home, qualification of mother and father, reading of interesting book at home, sharing of learning at home, ethnicity, and geographical location. The questionnaire also solicits information about how students spend time at home in various activities, whom they consult if they need assistance for their homework or lessons, availability of textbook and other resources, distance from home to the school, homework & project/practical work and feedback, parental education and occupation, participation in extracurricular activities, facilities at home, interesting subjects, school facilities, bullying, learning materials at school, math lab, library, use of ICT in teaching from teacher and others.

Student attitude survey

As part of the student questionnaire, the 2025 NASA study (Grade 5) will include the items to solicit information from the students about their attitude/opinion towards various aspects of learning in their particular subjects (Mathematics, Nepali, Science & technology, and English) such as teachers' activities, teaching styles and behaviours. For this purpose, the student questionnaire includes a number of statements and the students will rate them in a 5-point scale (1 strongly disagree, 2 disagree, 3 neutral, 4 agree, and 5 strongly agree). As done in the previous NASA studies, an adopted version of the Fennema-Sherman Attitude Scale is used (see Fennema and Sherman, 1976) to develop the student attitude survey questionnaire. The original F-S attitude scale covers 9 areas but Melancon, Thompson, and Becnel (1994) found eight factors rather than nine. Later, Mulhern and Rae (1998) identified only six factors that are useful in an attitude scale (Sarmah, & Puri, 2014). Based on the shortened version of F-S, the following four areas are suggested to cover while developing questionnaires related to the attitude of students towards subjects: self-confidence; value, enjoyment and motivation (see, Tapia & Marsh, 2004).

Teacher questionnaire

Teacher questionnaire includes the items about the teachers' age, gender, mother tongue, highest qualification and subject, types of appointment (e.g. permanent, temporary, grant, locally appointed etc.), years of teaching experience, status of training and training contents, and availability and use of curriculum, textbooks, teachers' guide and other reference materials, development and implement of instructional plan (annual, daily, student's learning improvement plan and others), completion of teaching contents in a year, staff meeting for professional development and students' learning, difficulty contents while facilitating, project and practical works, use of ICT in teaching, effective facilitating strategies and techniques, status of the achievement of students' learning outcomes and ways to increase the achievement of learning outcomes. The questionnaire also solicits information from teachers about the various teaching activities they used, types and frequency of students' learning assessment, challenges and problems faced in teaching, points to be considered while using internal assessment, involvement in learning network, class supervision, professional development activities, areas of difficulties in teaching and other opinion about school facilities and provisions, motivation and satisfaction towards the profession, and opportunities and limitations they experienced in the school.

Head teacher's questionnaire

Head teachers' questionnaire includes the items to gather information about their qualifications, years of teaching and leadership experiences, types of school, distance from school to local level official, level of recruitment, the number of students and subject wise teachers in school, student attendance, physical facilities, availability and use of curriculum, textbook, teacher guide, staff meeting, economic status of students, students problems (late coming, absenteeism,

drop out, repetition rate, bullying, and teaching materials, composition and functioning of SMC and PTA and problems related to students and teachers. The questionnaire also includes items such as opinion about community support, teachers' collaboration and cooperation and partnership, teachers' dedication and involvement in work, reward system, taking period in a week, extra class provision, role of HT (administrative, academic) and others.

This chapter has discussed a conceptual overview of the contextual variables that are related with the students' learning achievement. Reviewing various national and international practices, this chapter provides some important areas and sources of information about the variables that are to be considered in such a large-scale national assessment. The review suggests that there will be four major sources of information from which contextual information is collected – students, teachers, parents and head teachers. For NASA 2025 (Grade 5), questionnaires will be prepared for students, teachers and head teachers. The items related to parental support will be incorporated into the student questionnaire. The information collected through these questionnaires will be associated with students' test scores to explain how the contextual variables can influence students' learning achievement.

4.4 Reporting the findings

The reporting of the NASA 2025 will include the following aspects:

- Write-map
- Proficiency descriptors based on the data
- Proportion of achieved curriculum by number of items answered correctly
- Proportion of students in the four proficiency levels
- Distribution of students in four proficiency levels by province, home language, sex, ethnicity, location: rural–rural municipality and urban–municipality, sub-metropolitan city and metropolitan city.
- Relation of achievement score with background variables

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