

NEW NORMAL CURRICULUM

Instructional Guide

Mathematics

Class: VI

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FOREWORD

COVID-19 has suddenly caused unforgiving disruptions in the public education all over the world, and brought about threats of fragmentation due to disparities in accessibility and connectivity in many systems. In Bhutan too, continuity of education and learning has been severely affected as a result of nationwide school closures and due to restrictions and health protocols. The disruptions have led to challenges in many existing patterns and trends in education resulting in a massive shift away from learning and teaching in traditional settings with physical interactions to the maximum in terms of relevancy and efficiency. This has caused a major problem for children living in poverty worldwide, who often rely on the physical settings of their schools for educational materials, guidance, and, sometimes, the only decent meal of the day.

In the new normal education, human interaction and well-being is a priority. Technology, particularly digital technology that enables communication, collaboration and learning across distance, is a formidable tool – not a panacea but a source of innovation and expanded potentials. As we embrace this exceptional opportunity to transform the world, and as we reimagine the organization of our educational institutions and learning environments, we will need to think about where we want to go.

In the post COVID 19 era, we must prioritize the development of the whole person not just academic knowledge. Inspiration for the change can be drawn from the 1996 Delors report, *Learning the treasure within*, in its specification of four pillars of learning as “learning to know”, “to do”, “to be”, and “to live together”. Therefore, curricula must be increasingly perceived as an integrated and based on themes and problems that allows learners to learn to live in peace with our common humanity and our common planet. This has the potential in the development of a strong base of knowledge about one’s self and about the world and find purpose and be better able to participate in social and political milieu.

The New Normal Curriculum is, not just a mere response to the pandemic, but also a culmination of the curriculum reform work for the last four years by the Royal Education Council. It is an attempt to transform education from the teaching of “what” to learning of “how” and “why” towards empowering learners with the transversal competencies and the 21st century skills, and preparing them to be lifelong learners. We are optimistic that this move orients our education process towards nurturing nationally rooted and globally competent citizens.

Wish all our learners and teachers a life enriching experiential teaching and learning.

(Kinga Dakpa)
DIRECTOR GENERAL

1. INTRODUCTION

The 21st Century Education framework stipulates the emphasis on the thematic based learning areas with a comprehensive support system. The theme-based approach broadens opportunities for experiential learning contextualized to the learner's physical, social, political, economic, spiritual and cultural setting. An approach, which mandates learning through active engagement of students. Roles of teachers are transformed from knowledge transmitter to facilitation, guide, evaluator, researcher and motivator.

The conventional education, which is predominantly knowledge based and examination centred teaching and learning has been the time old practices, and the stress of this model is on the learning of textual information perceived by educators important for the grade. On the other hand, with the advancement in ICT, the world is flooded with such information, which are widely read by all at their leisure. What students cannot acquire from the multiple sources are the skills, which are crucial in facilitating students to realise their potential to be socially responsible and productive individuals and contribute in the nation building processes: socio-economic and political development. In the contemporary world, the knowledge-based education compromises the development of psychomotor and affective domains of learning, which affects the holistic development of students.

Despite the devastating effect caused by COVID-19 pandemic, it presented scopes for creation, innovation, generally perceived more efficient and effective in work and social activities. The pandemic situation explicated that the old ways of working, teaching and learning, and lifestyle have limitations. Consequently, new normal ways of how we work and live, teach and learn are the contemporary traditions. In this context, an overhaul of how we think and do is an imperative, not a choice. The transformation of classroom instruction from teacher centred to learner centred teaching and learning, however calls for the following adjustment, or even the overhaul of a few practices.

- i) Reduction of learning content to facilitate deep learning as opposed to the width of the teaching through the active engagement of students.
- ii) Integration of ICT as tools and ends of learner's education. The use of multimedia and ICT software is commonly utilized in teaching and learning as innovation to introduce variation in stimuli and sustain learner's interest and zeal in learning.
- iii) Adoption of theme based learning content, which facilitates to broaden the horizon of learning beyond the four walls, and stimulates the transfer of learnt concepts to the learner's immediate environment. This arrangement makes students aware of the realities of the social, political, economic and cultural practices and ethos of the society. Being aware of the immediate environment of the scopes and challenges, students are sensitized of the opportunities and issues, which may need attention for a better future for the society.

- iv) Consideration to ground the curriculum design and instruction approaches the epistemological theories is imperative to facilitate deep learning as opposed to factual learning. However, the selection and use of them is subject to the nature of the respective subject. For instance, constructivism is more apt for science, while connectivism is relevant for languages and ICT curricula.
- v) Active engagement of students is imperative of competency-based education and learning. Inevitably, summative assessment has limitations in gauging the progressive development of the learner. This is achieved objectively by the use of the continuous formative assessment (CFA). However, if summative assessment evidence is used to provide feedback to help students in learning, it can serve as one of the techniques of CFA.

The curriculum adapted and grounded on the above wisdom, the principle of competency based learning, inspired by being aware of reality of the immediate environment, and the belief system of the society may be arbitrarily termed as the New Normal Curriculum. Learning is facilitated through the “Instructional Guide” with students taking responsibilities of their learning; teachers facilitate and guide students in the due course of their active engagement and assess their performance for improvement in their learning.

2. PURPOSE OF THE INSTRUCTIONAL GUIDE

In the New Normal Curriculum, deep learning synonymous to “less is more” is facilitated with the use of Instructional Guide for each subject and specific class. The content of the instruction in the guide for respective subjects are aligned with the subject’s curriculum framework with partial reference to the existing textbooks. Therefore, it is purported to achieve the following objectives:

- i) Facilitate learning anywhere, any time with the learner being responsible for the learning.
- ii) Facilitate deep learning with awareness and sensitivity of the realities of the world around.
- iii) Strengthen competency based learning and experiential learning to foster sensitivity of realities of the life and environment.
- iv) Strengthen blended learning and flip classroom with multimedia, digital pedagogies and ICT devices and websites as the tools and learning content.
- v) Guide parents in facilitating learning of their children.
- vi) Inspire teachers to assume the roles of facilitation, guide, motivator and evaluator.
- vii) Helps in the prioritization of learning content with emphasis to create time and space for active engagement of learners.

- viii) Facilitate the use of CFA for learning through objective observation and guidance.

The effective and efficient use of this guide is subject to the nature of the subject and the target class. The section on “How to Use the Guide” included in each subject provides tips on the efficient use of the guide.

3. GUIDING PRINCIPLES IN THE DEVELOPMENT OF THE GUIDE

The priority of education is to deliver learning that is relevant to the life of learners, challenge learners, foster the art of lifelong learning, serve as a source of inspiration and equip them with transversal skills. These principles form the basis for provision of learning experiences and engagement of learners in the developmental process of the curriculum, delivery, ways of achieving, and the context of measuring learner’s performance.

a. Competency based

Understanding that the contemporary world is flooded with information, which serve as the sources of knowledge and ideas, the education for the acquisition of knowledge is irrelevant and redundant. Consequently, the priority of education is shifting to empowering learners with transversal skills and life skills as means to help learners realize and develop their potential.

Therefore, this guide is to ensure that the teaching and learning emphasises on the development of skills and foster positive attitude for learning, as opposed to knowledge acquisition, through active engagement of learners in diverse learning experiences.

b. Experiential learning

Learner’s learning experiences are contextualised to the immediate environment – social, political, economic and physical, which provide opportunities for the development of competencies of creativity, critical thinking and problem solving, collaboration, communication, citizenship and cultural skills.

This is made possible through active engagement in diverse learning contexts and experiences. Such approach, thus speculates that the stress is on the understanding of fundamental concepts, principles, laws and ideas. This indicates that the peripheral ideas, examples and textual information are learnt as extended information. The integration of blended learning and flip classroom modes and place based education approach of instruction offer greater flexibility and opportunities to generate new knowledge by themselves along with the development of associated skills.

c. Gross National Happiness (GNH)

The principles of GNH should be deeply embedded in the curriculum for the holistic development of the learner. This will prepare the learner to participate and contribute to the culture, society, and economy of the country more meaningfully. The wisdom drawn from this principle is vital in the creation of “living school culture” and upholds the principle of emotional intelligence to foster gender sensitivity, equity and equality to education.

In this context, it is imperative of the guide that the elements of GNH are integrated as the learning content and are practiced as the inclusive pedagogical process in the classroom or at home.

d. Inclusiveness

It should value and include the knowledge, perspectives, and backgrounds and experiences of each learner to realise his or her full potential. Education is intended for all children in Bhutan, and due respect and acceptance is accorded to cohorts of learners from diverse backgrounds, and with cognitive and physical individual differences. It will mean deploying and accepting different starting points, a different pace of learning and ensuring that students are challenged to achieve high standards in ways that complement what they already know, what they can already do, and how they learn best.

This guide upholds the ideology of inclusiveness and education for all through the integration of diverse learning experiences and approaches, and assessment of the progress of their learning.

e. Learner-centered and developmentally appropriate

This implies that curricular contents, teaching techniques and assessment methods for each grade or level of school education are selected in accordance with children’s developmental stages and needs of individual learners. Each child is different and the rate at which an individual child grows and reaches various developmental stages varies, although the patterns and sequences for growth and development are usually the same for all. They should be able to progress at a rate, which matches their needs and aptitudes.

The curriculum should be relevant to the learners’ lives both current and future. It will be responsive to the social and technological changes and meet the needs of the students. It will thus be a balance between what is imperative for all the students, and be flexible for learning at the learner’s pace and time.

f. Approaches

According to John Dewey and other educators, progressive education must prepare learners for active participation in education. The focus of education must be creating

critical thinkers and inquirers who are active learners. Most progressive education programs have the following qualities in common:

- Integration of entrepreneurship into education
- Strong emphasis on problem solving and critical thinking
- Learning by understanding as the goals of learning as opposed to rote knowledge
- Collaborative and cooperative learning strategies to develop social skills
- Education for social responsibility and democracy
- Personalized learning and living school culture based on differentiated instruction accounting for each individual's personal needs and goals
- Integration of community service and service learning projects into the curriculum
- Emphasis on varied learning resources and de-emphasis on textbooks
- Integration of digital technologies and pedagogies
- Appropriate assessment techniques and tools deployed in the CFA

4. CURRICULUM CONTENT

This is the main part of the instructional guide. It contains suggested approaches to teaching to guide students to achieve the desired competency(ies) through the identified topic(s).

a. Broad theme /Strand/Chapter/Topic

Under this heading, the topic/topics under one strand or under different strands that can be addressed together is/are listed. The topics are taken from the framework and not from the textbooks.

b. Competency(ies)

Under this heading, the main competency(ies) associated with the topic(s) listed under 4.1 above is/are listed.

c. Pedagogy

Under this heading, pedagogy to provide direction to deliver a lesson when the teaching and learning happens through face to face (contact) or through a virtual mode (non-contact) if classes cannot be conducted due to school closures is recommended. The recommended pedagogies are linked to competencies. These pedagogical approaches are only recommendations and teachers have the leeway to design their own plans.

The pedagogies should focus on hands-on, experiential learning through problem-based or project-based approaches. In mathematics, students should be provided opportunities to connect, communicate and represent mathematical ideas. They should be provided with divergent thinking opportunities and reflect on their learning.

In case of non-contact approach, pedagogies should be supported through the:

- i) Use of relevant learning platform – Google Classroom, Sherig LMS, WeChat, WhatsApp, Telegram
- ii) Use of ICT Tools to deliver lessons – video conferencing tools (Zoom and Google Meet, etc.), MS power point, screen recording software, etc.)
- iii) Use of ICT tools for assessment (Google Forms, Google Docs, Google Sheet, etc)
- iv) Use of ICT Tools for recording and reporting the performance (Grading in Google Classroom, Google Sheet, etc. reporting – all assessment records to be transferred to progress report for promotion or detention)

d. Assessment

Under this heading, performance tasks focusing on assessing competencies and not content are recommended. For classes PP – III, teachers can align with the Continuous Formative Assessment (CFA) guide book.

Achievement of learning shall be recorded based on bands of achievement for all students in all classes. The evidence from assessment is to identify individual learning needs, design, and deliver appropriate interventions to support students falling in the beginning and approaching category.

Reporting for classes PP – III shall be on a quarterly basis as per CFA guide book. For other classes, it shall be based on existing policy till there is a change in policy. Marks obtained for each strand and ultimately for each subject from the formative assessment can be converted using appropriate conversions for summative purposes.

$$CA\ Marks = \frac{\quad}{h\ h} \times CA\ for\ the\ term$$

e. Resources

All resources required for the suggested activities and tasks above are listed under this topic for both contact as well as non-contact teaching.

5. STRAND AND TOPIC-WISE INSTRUCTIONAL GUIDE

Topic: VI-A1 Factors of Whole Numbers VI-A2 Common Factors Whole numbers

A. Competencies

- Demonstrate the ability to factorize numbers and identify common factors in a systematic manner.

Objectives

- Conclude that the number is always a multiple of any of its factors.
- Find factors by dividing systematically.
- Describe, through investigation, that the greatest factor is always the number itself and the least factor is always 1.
- Describe, through investigation, that the second greatest factor is always $\frac{1}{2}$ the number or less.
- Find common factors in a systematic way.
- Reason out that 1 as a common factor of any set of numbers.
- Find the common factor of two or three numbers.
- Factorise by dividing smaller numbers and looking for a remainder of 0.

B. Pedagogy

Contact teaching and learning

- Provide a few numbers and let students interpret into different forms of multiplication.
Example: 12 can be interpreted into different ways, as 1×12 , 2×6 and 3×4 .
- Tell students these interpreted numbers are called factors.
- Demonstrate on factorization by dividing systematically.
- Provide a worksheet and let students find factors of the given numbers.
- Tell students to identify and record the common factors.

Non-contact teaching and learning

- Use social media platforms to deliver the lesson.
- Prepare a presentation on factorization of numbers and identifying common factors in a systematic manner. Let students find factors and common factors of numbers.
- Suggested video link <https://www.youtube.com/watch?v=ONvLtTwnUHs>
(This video explains identifying factors with the help of multiplication table).

C. Assessment

Contact

Performance task 1

- Provide a worksheet or use students' textbook to let students factorize and identify common factors. Assess students' factorizing skill and investigating skill.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Provide a worksheet or use students' textbook to let students factorize and identify common factors. Assess students' factorizing skill and investigating skill.

Suggested website for an interactive worksheet:

https://www.liveworksheets.com/worksheets/en/Math/Factors_and_multiples

(Choose an appropriate worksheet or create original worksheet)

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) ICT tools (if any)

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Online resources:
 - <https://www.youtube.com/watch?v=0NvLtTwnUHs>
 - https://www.liveworksheets.com/worksheets/en/Math/Factors_and_multiples
- c) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Template to record assessment

Strand(s): Numbers and Operations		Topic(s): Factors of Whole Numbers, Common Factors Whole numbers		
Competency: Demonstrate the ability to factorize numbers and identify common factors in systematic manner.				
Name of the student	Level of achievement			
	Beginning	Approaching	Meeting	Exceeding

Topic: VI-A3 Prime Numbers: Distinguish from Composites

A. Competencies

- Demonstrate the ability to distinguish between prime and composite numbers.

Objectives

- Define prime numbers by investigating dimensions of rectangles.
- Explain that 1 is not a prime (doesn't have 2 factors).
- Explain that ideas of prime apply only to whole numbers.

B. Pedagogy

Contact teaching and learning

- Pre-assessment on area of rectangle(form different rectangles with given area)
- Use the link to distinguish prime from composite shapes
<https://cutt.ly/0knAqKt>
- Explore PhET interactive simulation <https://cutt.ly/FknPsSh> to define prime numbers
- After exploring phET simulation students draw some conclusion:
 - numbers which are arranged in rectangles in only one way are prime numbers
 - number 1 is not a prime number(doesn't have 2 factors)
 - prime numbers apply only to whole numbers.

Non-contact teaching and learning

- Pre-assessment on area of rectangle(form different rectangles with given area)
- Use the video link to distinguish prime from composite shapes
<https://cutt.ly/0knAqKt>
- Explore PhET interactive simulation <https://cutt.ly/FknPsSh> to define prime numbers
- After exploring phET simulation students draw some conclusion:
 - numbers which are arranged in rectangles in only one way are prime numbers
 - number 1 is not a prime number(doesn't have 2 factors)
 - prime numbers apply only to whole numbers.

C. Assessment

Contact

Performance task 1

- Design an assessment task where students find prime numbers by relating with area of rectangle (teacher provide at least 7 numbers that consist of both prime numbers and composite numbers).

Performance task 2

- Use the link <https://cutt.ly/QknSxxA> to distinguish prime numbers and composite numbers.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Use the link <https://cutt.ly/QknSxxA> to distinguish prime numbers and composite numbers.

Design appropriate assessment tools and record the student learning based on the template in the annexure.

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Grids
- c) Online resources
 - <https://cutt.ly/0knAqKt> (video link to distinguish prime from composite shapes)
 - <https://cutt.ly/FknPsSh> (exploring prime numbers by relating with area of rectangles)
 - <https://cutt.ly/QknSxxA> (live worksheet to sort prime numbers from composite numbers)

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Grids
- c) Online resources:
 - <https://cutt.ly/0knAqKt> (video link to distinguish prime from composite shapes)
 - <https://cutt.ly/FknPsSh> (exploring prime numbers by relating with area of rectangles)
 - <https://cutt.ly/QknSxxA> (live worksheet to sort prime numbers from composite numbers)
- d) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-A4 Reading and Writing Large Numbers VI-A5 Place Value

A. Competencies

- Demonstrate the ability to read, write and rename whole numbers and decimals in various formats.

Objectives

- Read and write numbers in words.
- Read and write rounded decimals (345.3 million).
- Read and write numbers in expanded form.
- Show that the place values in the decimal number system follow patterns
 - Each position represents 10 times as much as the position to its left.
 - Each position represents $\frac{1}{10}$ as much as the position to its right.
- Explain that positions are grouped in 3s for purpose of reading them, both before and after the decimal point

B. Pedagogy

Contact teaching and learning

- Display different numbers and let students read and write the numbers in words.
- Demonstrate on rounding off whole numbers and writing whole numbers in expanded form.
- Provide a worksheet or display some whole numbers.
- Let students round off the given numbers and write in expanded form.
- Demonstrate on rounding off decimal numbers and writing decimal numbers in expanded form.
- Provide a prepared worksheet or display some decimal numbers.
- Let students round off the given numbers and write in expanded form.
- Let students watch video on how rounding numbers are done using the link given below.

<https://www.youtube.com/watch?v=fd-E18EqSVk>

Non-contact teaching and learning

- Use social media platforms to deliver the lesson.
- Prepare a presentation on rounding off and writing in expanded form.
- Suggested video link <https://www.youtube.com/watch?v=fd-E18EqSVk> (This video is about rounding off whole numbers and decimal numbers).

C. Assessment

Contact

Performance task 1

- Provide a worksheet and let students round off whole numbers and decimal numbers. Assess students' connecting skill.
- Let students write some applications of rounding off numbers to solve problems in daily life.

Performance task 2

- Let students write whole numbers and decimal numbers in expanded form (Refer question from the Mathematics Textbook class VI).

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Provide a worksheet and let students round off whole numbers and decimal numbers. Assess students' reading skill and connecting skill.

Suggested website for an interactive worksheet:

<https://www.matific.com/au/en-au/home/maths-activities/year-5/decimals/rounding/>

https://www.liveworksheets.com/worksheets/en/Math/Rounding_numbers

(Choose an appropriate worksheet).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) BLM (Place Value Chart)
- c) ICT tools (if any)
- d) Online resources
 - <https://www.youtube.com/watch?v=fd-E18EqSVk>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) BLM (Place Value Chart)
- c) Online resources:
 - <https://www.youtube.com/watch?v=0NvLtTwnUHs>
 - [https://www.liveworksheets.com/worksheets/en/Math/Factors_and_multipl
es](https://www.liveworksheets.com/worksheets/en/Math/Factors_and_multipl
es)
- d) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-A6 Rename Mixed Numbers and Improper Fractions

A. Competencies

- Demonstrate ability to rename fractions.

Objectives

- Use pictorial models to illustrate improper fraction and mixed numbers.
- Inter-convert improper fractions and mixed numbers.

B. Pedagogy

Contact teaching and learning

- Conduct pre-assessment for relating improper fraction and mixed numbers.
- Design an activity to illustrate improper fraction and mixed numbers through pictorial models.
- Use the link <https://www.youtube.com/watch?v=TrutPJf9GmQ> to convert mixed numbers to improper fraction.
- Use the link <https://www.youtube.com/watch?v=GpumUOiGS6Q> to convert improper to mixed numbers.

Non-contact teaching and learning

- Use social media platforms to deliver the lesson.
- Use the link <https://www.youtube.com/watch?v=TrutPJf9GmQ> to convert mixed numbers to improper fraction.
- Use the link <https://www.youtube.com/watch?v=GpumUOiGS6Q> to convert improper to mixed numbers.

C. Assessment

Contact

Performance task 1

- Design a task to represent improper and mixed numbers using pictures.

Performance task 2

- Use the live worksheet link <https://cutt.ly/Hkn1d9L> to convert improper and mixed to one another.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Design a task to represent improper and mixed numbers using pictures.

Performance task 2

- Use the live worksheet link <https://cutt.ly/Hkn1d9L> to convert improper and mixed to one another.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Online resources
 - <https://www.youtube.com/watch?v=TrutPJf9GmQ>
 - <https://www.youtube.com/watch?v=GpumUOiGS6Q>
 - <https://cutt.ly/Hkn1d9L>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Online resources:
 - <https://www.youtube.com/watch?v=TrutPJf9GmQ>
 - <https://www.youtube.com/watch?v=GpumUOiGS6Q>
 - <https://cutt.ly/Hkn1d9L>
- c) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-A7 Converting Simple Fractions to Decimals
VI-A8 Comparing Fractions
VI-A14 Explore Equivalent Fraction

A. Competencies

- Demonstrate ability to convert simple fractions to decimals and compare fractions.

Objectives

- Make connections between fractions and division using models.
- Investigate repeating decimals through models.
- Compare fractions based on common denominator and common numerator.
- Compare fractions using equivalent decimals and benchmarks.
- Investigate the multiplicative relationship of numerator/ denominator.
- Investigate results when numerators of equivalent fractions differ by a constant amount.

B. Pedagogy

Contact teaching and learning

- Conduct pre-assessment about converting simple fractions to decimals.
- Use models to relate fractions and decimals. Use a grid to represent fractions and convert to decimals (decimal tenths and decimal hundredths).
- Use the appropriate link <https://cutt.ly/lkmi0et> to compare fractions with common denominator and common numerator.
- Demonstrate how to convert fractions to equivalent decimals and then compare the fractions.
- Similarly use the video link <https://cutt.ly/lkmdSoD> to compare fractions using benchmark angles.
- Design an activity to investigate and explore about equivalent fractions:
 - multiplicative relationship of numerator/ denominator
 - results when numerators of equivalent fractions differ by a constant amount.

Non-contact teaching and learning

- Use social media platforms to deliver the lesson.
- Use models to relate fractions and decimals. They may use a grid to represent fractions and convert to decimals (decimal tenths and decimal hundredths).

- Use the appropriate link <https://cutt.ly/lkmi0et> to compare fractions with common denominator and common numerator.
- Demonstrate how to convert fractions to equivalent decimals and then compare the fractions.
- Similarly use the video link <https://cutt.ly/JkmdSoD> to compare fractions using benchmark angles.

C. Assessment

Contact

Performance task 1

- Design an activity to convert simple fractions to decimals and compare fractions.

Performance task 2

- Use the given link <https://cutt.ly/8kWorQt> to compare fractions based on common denominator and common numerator.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Design an activity to convert simple fractions to decimals and compare fractions.

Performance task 2

- Use the given link <https://cutt.ly/8kWorQt> to compare fractions based on common denominator and common numerator.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- Textbook and guide book (Class VI Mathematics)
- Grid
- Online resources
 - <https://cutt.ly/lkmi0et>
 - <https://cutt.ly/JkmdSoD>
 - <https://cutt.ly/8kWorQt>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Grid
- c) Online resources:
 - <https://cutt.ly/lkmi0et>
 - <https://cutt.ly/JkmdSoD>
 - <https://cutt.ly/8kWorQt>
- d) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-A9 Ratio: Part to part and Part to whole
VI-A10 Equivalent ratios
VI-A11 Percent: Developing Benchmarks
VI-A12 Rates: Relating to Ratios

A. Competencies

- Demonstrate the ability to use relationships among ratios, percent and rates.

Objectives

- Use concrete models to introduce the concept of ratio.
- Explain that ratios and fractions are both comparisons.
- Compare, a part to a whole and part to part.
- Connect models and symbols to develop multiplicative relationships.
- Simplify ratios to make interpretation of situations easier.
- Explore symbolically how a change in one term affects the other.
- Explain that, when a particular quantity is added to or subtracted from each term, the resulting ratios are not equivalent; the relationship needs to be multiplicative.
- Describe that percent is viewed as a special ratio where the second term is 100.
- Express percent as equivalent ratios.
- Represent percentage pictorially (grid).
- Recognize the relationship between the percent and decimal names of ratios.
- Find percent equivalents for common ratios like $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ (benchmarks).
- Recognize everyday situations in which percent is used.
- Recognize that rates are just like ratios except that they are comparisons of items in different units.
- Recognize that a rate can be described in more than one way.

B. Pedagogy

Contact teaching and learning

- Conduct pre-assessment on identifying fractions of a set or group.
- Explain the meaning of ratio with examples. Tell them how to read it.
- Using concrete models, demonstrate on comparing a part to a whole and part to part followed by pictorially and symbolically.
Example: In a group of 6 boys and 4 girls, the ratio 6:10 describes the ratio of boys to the whole group, and the ratio 6:4 describes the ratio of boys to girls.
- Let students read and simplify ratios to interpret for easier situations.
- Explain equivalent ratios.
- Let students investigate how a change in one term affects the other.

- Show adding on or subtracting from a term does not result in equivalent ratios.
- Let students represent percentage in a hundredths grid. Tell them why percent is viewed as a special ratio.
- Introduce rate and explain the relationship among ratios, percent and rates.
- Let students watch video on the relationship among ratio, percent and rate using the links below.
 - https://www.youtube.com/watch?v=UK-_qEDtvYo
 - <https://www.youtube.com/watch?v=qGTYS AeLTOE>

Non-contact teaching and learning

- Use social media platforms to deliver the lesson.
- Prepare a presentation on introducing ratios, percent and rates and their relationships.
Suggested video link to teach the concept of ratio, rate and percent
 - https://www.youtube.com/watch?v=UK-_qEDtvYo
 - <https://www.youtube.com/watch?v=qGTYS AeLTOE>

C. Assessment

Contact

Performance task 1

- Let students identify and match ratios with concretes or pictures and represent it symbolically.
Suggested sample of worksheet:
<https://www.liveworksheets.com/worksheets/en/Math/Ratios> (Choose an appropriate worksheets from the link)
- Let students represent percent in hundredths grid.

Performance task 2

- Let students apply the concept of ratio, percent and rate in solving word problems (*Refer questions from the Mathematics textbook class VI*).

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students solve the problems from the interactive worksheet link www.liveworksheets.com.

Performance task 2

- Let students apply the concept of ratio, percent and rate in solving word problems (*Refer questions from the Mathematics textbook class VI*).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- Textbook and guide book (Class VI Mathematics)
- BLM (hundredths grid)
- Online resources
 - https://www.youtube.com/watch?v=UK-_qEDtvYo
 - <https://www.youtube.com/watch?v=qGTYS AeLTOE>
 - <https://www.liveworksheets.com/worksheets/en/Math/Ratios>

Non-contact

- Textbook and guide book (Class VI mathematics)
- BLM (hundredths grid)
- Online resources:
 - https://www.youtube.com/watch?v=UK-_qEDtvYo
 - <https://www.youtube.com/watch?v=qGTYS AeLTOE>
 - www.liveworksheets.com
- Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-A13 Multiplication and Division Computation Patterns

A. Competencies

- Demonstrate the ability to apply multiplication and division patterns.

Objectives

- Re-arrange factors to simplify computation (e.g. 28×250 is more difficult than 7×1000)
- Discuss how a change in either factor affects the computation
- Realize that dividing one factor and multiplying the other by the same amount produces no change in the final result.

B. Pedagogy

Contact teaching and learning

- Demonstrate on simplifying computation by rearranging factors.
 - Example: 28×250 is more difficult than 7×1000 , though both have the same product.
- Let students investigate and justify on affecting of a result as a factor is changed.
 - Example: $\square \times 100$: as \square increases by 1, the product increases by 100.
- Discuss that dividing one factor and multiplying the other by the same amount produces no change in the final result.

Non-contact teaching and learning

- Use social media platforms to deliver the lesson.
- Prepare a presentation on multiplication and division patterns.
- Let students observe the change in result as one variable changes. They should be able to comprehend their observation.

C. Assessment

Contact

Performance task 1

- Provide a worksheet on investigating patterns in dividing by power of tens and multiplying by decimal power of tens. Let students investigate and generate pattern rules.

Let students explore the interactive worksheet link provided below:

<https://www.iknowit.com/fifth-grade.html> (choose an appropriate worksheet)
<https://www.matific.com/au/en-au/home/maths-activities/year-5/decimals/multiplication/> (choose an appropriate worksheet).

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Provide a worksheet on investigating patterns in dividing by power of tens and multiplying by decimal power of tens. Let students investigate and generate pattern rules.
Let students explore the interactive worksheet link provided below:
<https://www.iknowit.com/fifth-grade.html> (choose an appropriate worksheet)
<https://www.matific.com/au/en-au/home/maths-activities/year-5/decimals/multiplication/> (choose an appropriate worksheet).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Base ten blocks
- c) Worksheet
- d) Online resources
 - <https://www.iknowit.com/fifth-grade.html>
 - <https://www.matific.com/au/en-au/home/maths-activities/year-5/decimals/multiplication/>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Worksheets
- c) Online resources:
 - <https://www.iknowit.com/fifth-grade.html>
 - <https://www.matific.com/au/en-au/home/maths-activities/year-5/decimals/multiplication/>
- d) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-A15 Addition and Subtraction of Simple Fractions With Various Denominators

A. Competencies

- Add and subtract simple fractions with various denominators.

Objectives

- Develop conceptual understanding by exploring models (pattern blocks, fraction circles).
- Solve fraction problems in context.

B. Pedagogy

Contact teaching and learning

- Conduct pre-assessment (equivalent fractions and comparing fractions).
- Explain how to add and subtract fractions using same denominator using diagrams (or use models like pattern blocks and fractions circles)
- Let the students watch the video on how to add fractions with different denominator using these links
 - <https://www.youtube.com/watch?v=HBU6k25wSj4>
 - <https://www.youtube.com/watch?v=s8e3XKkjOUw>
(watch and trim the video before letting students watch).
- Let students discuss and explore on how to add and subtract fractions with different denominator using fraction strips.
- Let students solve fractions problems (refer questions in the textbook).

Non-contact teaching and learning

- Use social media platforms to deliver the lesson.
- Prepare a video on how to add and subtraction fractions and share it to the students via social media (WeChat/Telegram/Google Classroom)
- Let the students watch the video on how to add and subtract fractions with different denominator using these links
 - <https://www.youtube.com/watch?v=HBU6k25wSj4>
 - <https://www.youtube.com/watch?v=s8e3XKkjOUw>
(watch and trim the video before sharing).

C. Assessment

Contact

Performance task 1

- Provide a worksheet and lets students add and subtract fractions with various denominators (*Refer questions from the Mathematics textbook class VI*)

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Provide a worksheet and lets students add and subtract fractions with various denominators (*Refer questions from the Mathematics textbook class VI*).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- Textbook and guide book (Class VI Mathematics)
- Pattern blocks
- BLM (fraction strips)
- Online resources
 - <https://www.youtube.com/watch?v=HBU6k25wSj4>
 - <https://www.youtube.com/watch?v=s8e3XKkjOUw>

Non-contact

- Textbook and guide book (Class VI mathematics)
- BLM (fraction strips)
- Online resources:
 - <https://www.youtube.com/watch?v=HBU6k25wSj4>
 - <https://www.youtube.com/watch?v=s8e3XKkjOUw>
- Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-A16 Multiplication and Division of Decimals

A. Competencies

- Demonstrate an understanding of multiplication and division of decimals using algorithms.

Objectives

- Connect decimal multiplication with whole number division.
- Link pictorial models to algorithms.
- Apply estimation strategies: rounding, front-end.

B. Pedagogy

Contact teaching and learning

- Pre-assessment on multiplying and dividing whole numbers.
- Use hundredths grid (pictorial) to demonstrate multiplication of decimals.
Use this link to learn how to multiply decimals using models
https://www.youtube.com/watch?v=xVqIndbswnw&feature=emb_logo
- Let students solve a few problems and link pictorial models to algorithms.
Ask them to justify.
- Use hundredths grid (pictorial) to demonstrate division of decimals.
Link for suggested video:
<https://www.youtube.com/watch?v=HbmZBLstwz0> (This video shows dividing decimals using models)
- Discuss on various estimation strategies.

Non-contact teaching and learning

- Use social media platforms to deliver the lesson.
- Prepare a presentation on multiplying and dividing decimals and estimating strategies.
Suggested video link:
https://www.youtube.com/watch?v=xVqIndbswnw&feature=emb_logo (This video shows multiplying decimals using models)
<https://www.youtube.com/watch?v=HbmZBLstwz0> (This video shows dividing decimals using models)

C. Assessment

Contact

Performance task 1

- Provide some problems on multiplying decimals to assess students' estimating skill and applying skill.

Performance task 2

- Let students solve some problems on dividing decimals (*Refer questions from the Mathematics textbook class VI*).

Let students explore and solve the problems on multiplying and dividing decimals in the links provided

https://www.liveworksheets.com/worksheets/en/Math/Multiplying_Decimals
<https://www.liveworksheets.com/search.asp?content=dividing+decimals>

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students solve some problems on multiplying decimals.

Use this link to solve the problems

https://www.liveworksheets.com/worksheets/en/Math/Multiplying_Decimals

Performance task 2

- Let students solve some problems on dividing decimals (*Refer questions from the Mathematics textbook class VI*).

Let students explore and solve the problems on dividing decimals in the link provided

<https://www.liveworksheets.com/search.asp?content=dividing+decimals>

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) BLM (hundredths grid)
- c) Online resources
 - https://www.youtube.com/watch?v=xVqIndbswnw&feature=emb_logo
 - <https://www.youtube.com/watch?v=HbmZBLstwz0>
 - https://www.liveworksheets.com/worksheets/en/Math/Multiplying_Decimal
 - <https://www.liveworksheets.com/search.asp?content=dividing+decimals>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) BLM (hundredths grid)
- c) Online resources:
 - https://www.youtube.com/watch?v=xVqIndbswnw&feature=emb_logo
 - <https://www.youtube.com/watch?v=HbmZBLstwz0>
 - https://www.liveworksheets.com/worksheets/en/Math/Multiplying_Decimal
 - <https://www.liveworksheets.com/search.asp?content=dividing+decimals>
- d) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-B1 Explore Area patterns

A. Competencies

- Draw conclusion how changes in base or height affect the area of rectangles, parallelograms, and triangles, using concrete materials.

Objectives

- Explore concretely how changes in base/length affect area of rectangles, parallelograms, triangles
- Link concrete to symbols which represent the changes e.g. parallelograms: $A = bh$ so if b and h are both doubled, area is doubled if b is doubled but h is halved the area remains the same.

Note: The Pedagogy and Assessment for this topic has been included with the topics in strand C.

Topic: VI-B2 Explore Volume Patterns

A. Competencies

- Explore to infer that changes in one dimension affects the volume of a rectangular prism.

Objectives

- Explore how changes in one dimension of the formula affects the volume of a rectangular prism and relate this to the volume formula $V = l \times w \times h$.

Note: The Pedagogy and Assessment for this topic has been included with the topics in strand C.

Topic: VI-B3 Square and Triangular Numbers

A. Competencies

- Demonstrate the ability to represent pictorially and symbolically and show both geometric and numerical patterns for square and triangular numbers.

Objectives

- Represent pictorially and symbolically to show both geometric and numerical patterns
- Show that square numbers may be represented in square arrays and are the products of numbers multiplied by themselves
- Show that each triangular number is half the number in an array with dimensions that are one unit apart (adding of consecutive numbers)
- Display triangular numbers visually (as though a rectangle cut diagonally).

B. Pedagogy

Contact teaching and learning

- Provide identical concrete materials (base ten blocks) to each group.
- Instruct students to create growing squares using concrete. Ask them to share their observations. Let them observe that the square numbers are the products of numbers multiplied by themselves.
- Demonstrate on representing square numbers in square arrays.
- Provide identical concrete materials (base ten blocks/counters) to each group.
- Instruct students to create growing triangles using concrete. Ask them to share their observations.
- Demonstrate on representing triangular numbers are half the number in an array with dimensions that are one unit apart.
- Show that if a triangular number is doubled, a rectangle is obtained that has a width and length that are 1 unit apart.
- Let students watch videos on square and triangular numbers using the links below
 - <https://www.youtube.com/watch?v=PDyyvPdi1tl> (This video introduces square numbers)
 - <https://www.youtube.com/watch?v=go2BbLPOZj4> (This video introduces triangular numbers)

Non-contact teaching and learning

- Use social media platforms to deliver the lesson.
- Prepare a presentation on square numbers and triangular numbers.
Suggested video link:
 - <https://www.youtube.com/watch?v=PDyyvPdi1tl> (This video introduces square numbers)
 - <https://www.youtube.com/watch?v=go2BbLPOZj4> (This video introduces triangular numbers)

C. Assessment

Contact

Performance task 1

- Let students list all the square numbers from 1 to 200
- Let students list all the triangular numbers from 1 to 100.

Performance task 2

- Let students draw a diagram to show the 13th square number.
- Let students draw a diagram to show the 10th triangular number.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students list all the square numbers from 1 to 200.
- Let students list all the triangular numbers from 1 to 100.

Performance task 2

- Let students draw a diagram to show the 13th square number.
- Let students draw a diagram to show the 10th triangular number.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Counters
- c) Online resources
 - <https://www.youtube.com/watch?v=PDyyvPdi1tl>
 - <https://www.youtube.com/watch?v=go2BbLPOZj4>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Online resources:
 - <https://www.youtube.com/watch?v=PDyyvPdi1tl>
 - <https://www.youtube.com/watch?v=go2BbLPOZj4>
- c) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-B4 Linear Equations: Using open frames

A. Competencies

- Demonstrate the ability to solve simple linear open frame equations.

Objectives

- Use simple linear open frame equations to solve problems related to real life situations.

B. Pedagogy

Contact teaching and learning

- Pre-assessment on open number sentence.
- Design an activity to solve simple linear open frame equations that involves single operations and combined operations.
Example: a. $8 + n = 17$ b. $6 + f \times 4 = 48$
- Use the given link <https://cutt.ly/NkWJzQf> to discuss how to develop simple linear open frame equations. Then provide related questions and solve those questions.

Non-contact teaching and learning

- Use social media platforms to deliver the lesson.
- Design an activity to solve simple linear open frame equations that involves single operations and combined operations.
Example: a. $8 + n = 17$ b. $6 + f \times 4 = 48$
- Use the given link <https://cutt.ly/NkWJzQf> to discuss how to develop simple linear open frame equations. Then provide related questions and solve those questions.

C. Assessment

Contact

Performance task 1

- Design a task or develop worksheets about simple linear open frame equations for students to solve on their own.

Performance task 2

- Use the link <https://cutt.ly/PkWGb3l> to solve open frame equations.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Use the link <https://cutt.ly/PkWGb3l> to solve open frame equations.

Performance task 2

- Use PhET interactive simulation <https://cutt.ly/0kWZhQE> to develop and solve simple linear open frame equations.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Worksheets
- c) Online resources
 - <https://cutt.ly/NkWJzQf>
 - <https://cutt.ly/PkWGb3l>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Online resources:
 - <https://cutt.ly/NkWJzQf>
 - <https://cutt.ly/PkWGb3l>
 - <https://cutt.ly/0kWZhQE>
- c) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-C1 Calculate Area

A. Competencies

- Demonstrate the ability to calculate area using appropriate units.

Objectives

- Calculate area in cm^2 , m^2 , and km^2 .
- Choose appropriate units for actual situations.

B. Pedagogy

Contact teaching and learning

- Conduct pre-assessment (let students find the area of rectangles and squares).
- Identify classroom objects having rectangular/square shapes (e.g. table top, chalkboard)
- Ask them to measure the dimensions and find the area.

Non-contact teaching and learning

- Prepare a video how to measure the dimensions of the rectangular objects and find the area. Then share it to the students via social media (WeChat, telegram, Google Classroom).
- Identify the rectangular objects at home (e.g. table top, TV screen, window etc.).
- Ask them to measure the dimensions and find the area.

C. Assessment

Contact

Performance task 1

- Provide students with a few word problems on area and let them solve.

Performance task 2

- Let students measure the dimensions of things/objects outside (e.g. basketball court, photo frames, football ground) and find the area.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Provide students with a few word problems on area and let them solve.

Performance task 2

- Let students measure the dimensions of things/objects in their house (e.g. photo frame, book, paper).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Measuring tape/metre scale/Ruler
- c) Classroom objects

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Video on how to measure the dimension and find area.
- c) Ruler/measuring tape
- d) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-C2 Relate bases, heights, areas of Parallelograms

A. Competencies

- Explore the area of a parallelogram and a rectangle having the same base and height.

Objectives

- Show that the area of a parallelogram is the same as the area of a related rectangle (with same base and height).
- Determine the base or height, given the area and the other dimension.
- Show that a variety of parallelograms can have the same area.

B. Pedagogy

Contact teaching and learning

- Let students find the area of rectangle with the given dimension.
- Use the area of rectangle to develop a formula for the area of parallelogram (refer mathematics textbook class VI).
- Show how to find the base or height, given the area and the other dimension.
- Show that a variety of parallelograms having same area with different dimensions.
- This video link shows how to find the area of parallelogram <https://www.youtube.com/watch?v=PKzE3OWxDfQ>. (Watch and trim the video clip as per lesson required).
- Let students explore how change in length/base affect the area of rectangles and parallelograms.
- Let students explore lessons on areas of parallelogram in SIM class VI, volume 3.

Non-contact teaching and learning

- This video link shows how to find the area of parallelogram
- <https://www.youtube.com/watch?v=PKzE3OWxDfQ>. (Watch and trim the video clip as per lesson required and share it to the students via social media (WeChat, telegram, Google Classroom)).
- Let students explore how change in length/base affect the area of rectangles and parallelograms.
- Let students explore lessons on areas of parallelogram in SIM class VI, volume 3.

C. Assessment

Contact

Performance task 1

- Let students solve the question on area of parallelogram from Mathematics text book class VI.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students solve the question on area of parallelogram from Mathematics text book class VI.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) SIM class VI, volume 3
- c) Online resources
 - <https://www.youtube.com/watch?v=PKzE3OWxDfQ>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) SIM class VI, volume 3
- c) Online resources
 - <https://www.youtube.com/watch?v=PKzE3OWxDfQ>
- d) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-C3 Area of Triangle

A. Competencies

- Demonstrate the ability to show that the area of a triangle is half of the related parallelogram.

Objectives

- Explain that any triangle is half of a parallelogram.
- Show that the area of a triangle is half of the related parallelogram.
- Describe that as long as the base and height are the same, the areas of visually-different triangles are the same.

B. Pedagogy

Contact teaching and learning

- Pre-assessment (finding the area of parallelogram).
- Show that the area of a triangle is half of the related parallelogram (Refer Mathematics textbook Class VI, p.106)
- Show with examples that as long as the base and height are the same, the areas of triangles remain same in different positions.
- Let students explore how changes in base/height affect the area of triangles (If the base of the area is doubled, the area of the triangle will be doubled).
- Let students explore lessons on the area of the triangle in SIM class VI, volume 3.

Non-contact teaching and learning

- Prepare a video on the area of the triangle. Then share it to the students via social media (WeChat, telegram, Google Classroom).
- Use this suggested link <https://bit.ly/39UM8lQ> (watch the video on area and perimeter of different shapes and trim the video clip as per the lesson required). Or look for other video related to the topic.
- Prepare a powerpoint presentation (or it can be converted to an image file) on the area of the triangle and share it to the students via social media (WeChat, telegram, Google Classroom).
- Let students explore how changes in base/height affect area of triangles (If the base of the area is doubled, the area of the triangle will be doubled)
- Let students explore lessons on the area of the triangle in SIM class VI, volume 3.

C. Assessment

Contact

Performance task 1

- Let students solve the question on the area of triangle from Mathematics text book class VI.

Performance task 2

- Let the students show with examples that the area of a triangle is half of the related parallelogram.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students solve the question on area of triangle from Mathematics text book class VI.

Performance task 2

- Let the students show with examples that the area of a triangle is half of the related parallelogram.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) SIM class VI, volume 3

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) SIM class VI, volume 3
- c) Ppt. on area of triangle
- d) Online resources
 - <https://bit.ly/39UM8lQ>
- e) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-C4 Investigate Relations Between SI Units

A. Competencies

- Investigate the relationship between linear, square and cubic SI units.

Objectives

- Investigate the relationship between linear, square and cubic SI units
 - Linear mm-cm-dm-m-dam-hm-km
 - Square mm^2 - cm^2 - dm^2 - m^2 - dam^2 - hm^2 - km^2
 - Cubic mm^3 - cm^3 - dm^3 - m^3 .

B. Pedagogy

Contact teaching and learning

- Pre-assessment (use metric unit chart and let students convert one unit to another).
- Use the metric unit chart to show the relationships between SI units and convert one unit to another.
- Show how to convert area SI units (for example; $1 \text{ m}^2 = 10,000 \text{ cm}^2$). [Here, the students should know that they have to convert m to cm].
 $1 \text{ m}^2 = 1 \text{ m} \times 1 \text{ m}$, we know that $1 \text{ m} = 100 \text{ cm}$
So, $100 \text{ cm} \times 100 \text{ cm} = 10,000 \text{ cm}^2$.
- Let students explore the relationship among cubic SI units.

Non-contact teaching and learning

- Prepare a video on the linear SI units and share it to the students via social media (WeChat, telegram, Google Classroom).
- Prepare a PowerPoint presentation (or it can be converted to image file) on linear SI units and share it to the students via social media (WeChat, telegram, Google Classroom).
- Let students explore the relationship among area and cubic SI units.

C. Assessment

Contact

Performance task 1

- Provide a set of questions on conversion of SI units.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Provide a set of questions on conversion of SI units.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Metric Unit Chart

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Ppt. on SI units
- c) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-C5 Calculate Volume and Relate to Capacity

A. Competencies

- Describe capacity as how much a container can hold something and volume as how much space is occupied by a solid.

Objectives

- Investigate to conclude that volume of a rectangular prism = $l \times b \times h$.
- Relate volume to capacity.

B. Pedagogy

Contact teaching and learning

- Conduct pre-assessment (units to find the volume and capacity).
- Demonstrate how to find the volume of a rectangular prism. Then, provide a few questions and let students find the volume.
- Let students watch the video on how to find the volume using the link given below;
 - <https://www.youtube.com/watch?v=u1nWI2b0fT4>
- Let students find the volume of the classroom objects (e.g. book, chalk box, rectangular prism).
- Let students explore how changes in one dimension of the formula affects the volume of a rectangular prism.
- Explain the differences between volume and capacity.
- Relate volume to capacity.

Non-contact teaching and learning

- Prepare a video on how to find a volume of a rectangular prisms or use the link given below.
<https://www.youtube.com/watch?v=u1nWI2b0fT4> (Watch and trim the video before sharing).
- Let students find the volume of the objects they have at home (e.g. book, box, block cheese).
- Let students explore how changes in one dimension of the formula affects the volume of a rectangular prism.
- Prepare a note on the relation between volume and capacity and share it via social media (WeChat, Telegram and Google classroom).

C. Assessment

Contact

Performance task 1

- Provide a set of questions on calculating volume and relating it to capacity (refer questions from the Mathematics textbook class VI).

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Provide a set of questions on calculating volume and relating it to capacity (refer questions from the Mathematics textbook class VI).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Classroom objects
- c) Online resources
 - <https://www.youtube.com/watch?v=u1nWI2b0fT4>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Objects at home
- c) Online resources
 - <https://www.youtube.com/watch?v=u1nWI2b0fT4>
- d) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-C6 Mass

A. Competencies

- Demonstrate the ability to apply the concept of tonne in real life situations.

Objectives

- Investigate how much is a Tonne
- Establish relation: 1 Tonne equivalent to 1000 kg.

B. Pedagogy

Contact teaching and learning

- Pre-assessment on the conversion of mass units (ask students to recall how grams and kilograms are related. Then provide a few questions on the conversion).
- Let students watch the video on tonne using the link provided;
- <https://www.youtube.com/watch?v=x2XHpPVyp3A>
- Introduce tonne and let students give examples of where tonne is being used in real life.
- Solve a few questions related to tonne used in real life (Refer Mathematics Textbook class VI).
- Relate tonne to kg and let students solve a few questions.

Non-contact teaching and learning

- Prepare a video tonne and share it to the students via social media (WeChat, telegram, Google Classroom). or
- Let students watch the video on tonne using the link provided;
<https://www.youtube.com/watch?v=x2XHpPVyp3A>
- Let students think where tonne is being used in real life.
- Relate tonne to kg and let students solve a few questions.
- Solve a few questions related to tonne used in real life (Refer Mathematics Textbook class VI).

C. Assessment

Contact

Performance task 1

- Prepare a few questions on tonne and let students solve it (Refer Mathematics Textbook class VI).

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Prepare a few questions on tonne and let students solve it (Refer Mathematics Textbook class VI).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Online resources
 - <https://www.youtube.com/watch?v=x2XHpPVyp3A>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Online resources
 - <https://www.youtube.com/watch?v=x2XHpPVyp3A>
- c) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-D1 Estimate, Measure and Draw Angles

A. Competencies

- Demonstrate the ability to estimate, measure and draw angles between 0 and 90 degrees.

Objectives

- Measure angles using a protractor.
- Estimate, measure and draw angles between 0 and 90 degrees.

B. Pedagogy

Contact teaching and learning

- Pre-assessment (names of angles: right, acute, obtuse, and right).
- Let students estimate the angles (Provide the angles to the students).
- Let students use a protractor to measure the given angles.
- Let students use a protractor to draw angles between 0 to 90 degrees.

Non-contact teaching and learning

- Prepare a video lesson on the area of angle. Then share it to the students via social media (WeChat, telegram, Google Classroom). Or use this suggested link <https://www.youtube.com/watch?v=c3ILHIJXj4o> (Watch and trim the video clip as per lesson required). Or look for other videos related to the topic and share).

C. Assessment

Contact

Performance task 1

- Provide a set of angles and let students estimate and measure the angles using a protractor.

Performance task 2

- Let them draw the angles using a protractor.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Provide a set of angles and let students estimate and measure the angles using a protractor.

Performance task 2

- Let students draw the angles using a protractor. (*Students take a picture of their task and send it for assessment*).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Protractor

Non-contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Video on how to measure the dimension and find area
- c) Technological gadgets for learning (mobile, desktop, laptop...)
- d) Online resources
 - <https://www.youtube.com/watch?v=c3ILHIJXj4o>

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-D2 Rotations $1/4$, $1/2$, and $3/4$ turns

A. Competencies

- Demonstrate the ability to rotate shapes using various turn centres.

Objectives

- Use a variety of turn centres to rotate a shape by $1/4$, $1/2$, and $3/4$ turns.

B. Pedagogy

Contact teaching and learning

- Pre-assessment (let students rotate the shapes).
- Demonstrate how to rotate a shape with different turn centres.
- Let students identify the turn centres in the rotation.
- Let students rotate shape in various turn centres.

Non-contact teaching and learning

- Prepare a video lesson on rotation with various turn centres. Then share it to the students via social media (WeChat, telegram, Google Classroom). Or look for other video related to the topic and share (watch the video and trim the video clip as per the lesson required).
- Let students identify the turn centres in the rotation (provide questions to the students).
- Let students rotate shape in various turn centres (Provide questions to the students).

C. Assessment

Contact

Performance task 1

- Provide questions and let students rotate a shape using various turn centres.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Provide questions and let students rotate a shape using various turn centres.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Shapes for rotation

Non-contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Video (Rotation)
- c) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-D3 Rotational Symmetry Properties

VI-D4 Properties of Rotational Symmetry

A. Competencies

- Investigate the rotational symmetry and the order of turn symmetry of 2-D shapes.

Objectives

- Recognize, through concrete investigation, when a shape has rotational symmetry.
- Discover, through concrete investigation, that a square has rotational symmetry of order 4 while a non-square has rotational symmetry of order of 2.
- Relate rotational symmetry of squares and rectangles to other properties of squares and rectangles.
- Generalize properties of rotational symmetry for quadrilaterals and regular polygons.
- Describe that, for a 2-D shape to have rotational symmetry, it must be turned about a point so that it exactly coincides with its original position at least once in less than a complete rotation.
- Describe that the number of times it appears in the identical position during one complete rotation is the order of rotational symmetry.
- Describe that if a shape has to be rotated 360 degree before it fits its traced shape than it does not have rotational symmetry.

B. Pedagogy

Contact teaching and learning

- Revisit the previous lesson learned (i.e. on rotation). Let students rotate a few shapes.
- Explain that a shape has turn symmetry, or rotational symmetry if it looks the same when it is rotated less than one full turn around a turn centre (with examples).
- Use cut out shapes and let students investigate whether the shape has turn symmetry or not.
- Let students relate rotational symmetry of squares and rectangles to other properties of squares and rectangles.
- Discuss different examples of rotational symmetry in everyday life (wheels or tires on vehicles and bicycles, designs in textiles, the pattern on a checkerboard).
- Let students discover how many order of turn symmetry each shape has.

- Let the students watch the video on how to calculate order of rotational symmetry using the link below.
<https://www.youtube.com/watch?v=s4tS-ZmpJfw> (watch and trim video before letting students watch).

Non-contact teaching and learning

- Prepare a video lesson on rotational symmetry and share it to the students via social media (WeChat, telegram, Google Classroom). Or look for other video related to the topic and share (watch the video on and trim the video clip as per the requirement before sharing).
- Let the students watch the video on how to calculate order of rotational symmetry using the link below.
 - <https://www.youtube.com/watch?v=s4tS-ZmpJfw> (watch and trim video before sharing).
- Let students discover how many order of turn symmetry each shape has using the cut-out shapes.

C. Assessment

Contact

Performance task 1

- Let students identify whether the shape has turn symmetry or not.

Performance task 2

- Let students state the order of turn symmetry a shape has.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students identify whether the shape has turn symmetry or not.

Performance task 2

- Let students state the order of turn symmetry a shape has.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Cut out shapes
- c) Online resources
 - <https://www.youtube.com/watch?v=s4tS-ZmpJfw>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Cut out shapes
- c) Online resources
 - <https://www.youtube.com/watch?v=s4tS-ZmpJfw>
- d) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-D5 Combining Transformations

A. Competencies

- Describe that two congruent shapes on the same plane are images of one another under a translation, reflection, rotation or any combination of these three transformations.

Objectives

- Predict the image and then confirm the transformation results.
- Show that two congruent shapes on the same plane are images of one another under a translation, reflection, rotation or any combination of these three transformations.

B. Pedagogy

Contact teaching and learning

- Pre-assessment on transformations (discuss transformations with the class. Ask them what they know about the image of any transformation (it is congruent to the original shape).
- Explain that every congruent shape is the image of some transformation or combination of transformations.
- Use cardboard or paper shapes on a table top to model combining transformations.
- Let students predict what transformations are used and confirm through investigation.
- Or use this video link on transformations (<https://bit.ly/3jq6NBj>). (Watch and trim the video clip as per lesson required).

Non-contact teaching and learning

- Prepare a video lesson on combining transformations and share it to the students via social media (WeChat, telegram, Google Classroom). Or use this video link on transformations (<https://bit.ly/3jq6NBj>). (Watch and trim the video clip as per lesson required).
- Let students practice combined transformations (questions to be provided by the teacher).

C. Assessment

Contact

Performance task 1

- Let students carry out the task from Mathematics textbook class VI.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students carry out the task from Mathematics textbook class VI.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Cardboards/Cut out shapes
- c) Online resources
 - <https://bit.ly/3jq6NBj>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Cardboards/Cut out shapes
- c) Online resources
 - <https://bit.ly/3jq6NBj>
- d) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-D6 Bisectors: angles and line segments

A. Competencies

- Demonstrate the ability to bisect lines and angles.

Objectives

- Recognize and describe angle bisectors including perpendicular bisectors.

B. Pedagogy

Contact teaching and learning

- Carry out the activity (bisectors) given in Mathematics textbook class VI.
- Explain the concept of bisector (line and angle) with examples.
- Let the students differentiate perpendicular and non-perpendicular line bisectors.
- Let students identify angle and line bisectors given in Mathematics textbook class VI.
- Let students bisect the given angle and line segments.
- Allow students to discuss and identify line and angle bisectors in and outside the classroom.

Non-contact teaching and learning

- Prepare a PowerPoint presentation on bisectors and share it to the students via social media (WeChat, telegram, Google Classroom).
- Let the students differentiate perpendicular and non-perpendicular line bisectors.
- Let students identify angle and line bisectors given in Mathematics textbook class VI.
- Let students bisect the given angle and line segments.
- Allow students to discuss and identify line and angle bisectors in and outside their house.

C. Assessment

Contact

Performance task 1

- Provide the task on bisectors and let students solve it.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Provide the task on bisectors and let students solve it.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Ppt. on bisector
- c) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-D7 Nets of Prisms and Pyramids

A. Competencies

- Demonstrate the ability to create and interpret prisms and pyramids nets.

Objectives

- Create and interpret various nets for prisms and pyramids.

B. Pedagogy

Contact teaching and learning

- Pre-assessment (let students identify the nets for different rectangular prisms using GeoGebra).
- Draw nets for different prisms and pyramids. Discuss and interpret nets.
- Explore various nets for prisms and pyramids using GeoGebra. (suggested link: <https://www.geogebra.org/m/fw3PHEBu>).

Non-contact teaching and learning

- Prepare a powerpoint presentation on prism and pyramid nets (or it can be converted to image file) and share via social media (use any medium; WeChat, telegram, and Google classroom).
- Suggest students to explore various nets for prisms and pyramids using GeoGebra. (suggested link: <https://www.geogebra.org/m/fw3PHEBu>).

C. Assessment

Contact

Performance task 1

- Allow students to construct nets for different prisms and pyramids.

Performance task 2

- Let students interpret nets for different prisms and pyramids.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students construct nets for different prisms and pyramids.

Performance task 2

- Let students interpret nets for different prisms and pyramids.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Nets
- c) ICT tools (GeoGebra)
- d) Online resources
 - <https://www.geogebra.org/m/fw3PHEBu>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Nets
- c) Online resources
 - <https://www.geogebra.org/m/fw3PHEBu>
- d) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-D8 Sort Quadrilaterals by attributes VI-D9 Generalize Diagonal Properties

A. Competencies

- Demonstrate the ability to explore the diagonals of rhombus, parallelogram, kite and trapezoid.

Objectives

- Sort concretely by attributes, including angles.
- Generalize about diagonals for a rhombus: the diagonals are perpendicular bisectors of each other, form four congruent right triangles, bisect the angles of the rhombus, and are its two lines of reflective symmetry.
- Explore the diagonals for a parallelogram.
- Explore the diagonals of a kite and describe that the diagonals are perpendicular and form two pairs of congruent right triangles; one of the diagonals is bisected, and the other diagonal is a line of reflective symmetry and bisects two opposite angles of the kite.
- Explain that for a trapezoid, there are no special properties of its diagonals.

B. Pedagogy

Contact teaching and learning

- Pre-assessment (identify the diagonals in quadrilaterals).
- Let students explore and write the attributes of different quadrilaterals (rhombus, kite, parallelogram and trapezoid). (Use cut out quadrilaterals from BLM).
- Let the students watch this video on diagonal properties using this link
 - <https://www.youtube.com/watch?v=3lQ6fjww9ow> (Watch and trim the video clip as per lesson required).

Non-contact teaching and learning

- Prepare a PowerPoint presentation on attributes of quadrilaterals and share it to the students via social media (WeChat, telegram, Google Classroom). Or use this video link on diagonal properties (<https://www.youtube.com/watch?v=3lQ6fjww9ow>) (Watch and trim the video clip as per lesson required).
- Let students explore and write the attributes of different quadrilaterals (rhombus, kite, parallelogram and trapezoid). (Use cut out quadrilaterals from BLM).

C. Assessment

Contact

Performance task 1

- Let students fill up the table given in Mathematics Textbook Cl VI, p.169 (2019 reprint).

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students use the shapes (sorting quadrilaterals) in BLM and fill up the table given in Mathematics Textbook Cl VI, p.169 (2019 reprint).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) Cut out quadrilaterals
- c) Online resources
 - <https://www.youtube.com/watch?v=3lQ6fjww9ow>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Cut out quadrilaterals
- c) Online resources:
 - <https://www.youtube.com/watch?v=3lQ6fjww9ow>
- d) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-D10 Planes of Symmetry of 3-D Shapes

A. Competencies

- Investigate the planes of symmetry of cones, cylinders, prisms, and pyramids.

Objectives

- Generalize planes of symmetry for 3-D shapes.
- Explain that some 3-D shapes have planes of reflective symmetry – planes that bisect 3-D shapes such that all points in one-half are mirror images of the corresponding points in the other half.
- Describe, through investigation, that a cube has 9 different planes of symmetry.
- Investigate cones, cylinders, prisms, and pyramids for planes of symmetry (models should be right).

B. Pedagogy

Contact teaching and learning

- Pre-assessment on transformations (discuss the lines of symmetry and diagonals in different 2-D shapes).
- Use linking cubes to introduce the concept of planes of symmetry of 3-D shapes.
- Prepare few 3-D models (available materials) to show planes of symmetry.
- Use this video link on planes of symmetry
 - <https://www.youtube.com/watch?v=ivyxxMLZCvE> (Explain the video as it doesn't explain about the lesson).

Non-contact teaching and learning

- Share this link to learn about planes of symmetry (<https://www.youtube.com/watch?v=ivyxxMLZCvE>). (Explain the video as it doesn't explain about the lesson).

C. Assessment

Contact

Performance task 1

- Let students sketch the planes of symmetry for few prisms and pyramids.

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students sketch the planes of symmetry for few prisms and pyramids.

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook and guide book (Class VI Mathematics)
- b) 3-D model
- c) Linking cubes
- d) Online resources
 - <https://www.youtube.com/watch?v=ivyxxMLZCvE>

Non-contact

- a) Textbook and guide book (Class VI mathematics)
- b) Online resources:
 - <https://www.youtube.com/watch?v=ivyxxMLZCvE>
- c) Technological gadgets for learning (mobile, desktop, laptop...)

E. Annexure(s)

Refer VI A1 and A2 for template to record assessment

Topic: VI-E1 Data Collection and Handling VI-E2 Data organizing and Describing Data

A. Competencies

- Evaluate sampling results and describe that larger samples generally produce more reliable probabilities.
- Calculate mean, median and mode of a set of data.

Objectives

- Identify situation /problem.
- Formulate tools (Interview/questionnaire/document record/ observations)to collect data
- Generate samples avoiding bias
- Collect data from the samples.
- Explain and show mean, mode and median.
- Calculate mean, median and mode.
- Organize data in groups.

B. Pedagogy

Contact teaching and learning

- Explain the steps involved in collecting data with examples.
 - Identifying situations to collect data.
 - Formulating data collection tools (survey questionnaires).
 - Generating samples using random sampling avoiding bias.
 - Collecting data using developed tools.
 - Organizing collected data in tabular form.
 - Describing the data in the table.
- Make aware to the students that the larger samples generally produce more reliable probabilities.
- Then students choose a topic/problem.
- After that, design the data collection tools.
- After the data collection, explain and show how to calculate mean, mode and median and let students find mean, median and mode.
- Use this video link (<https://bit.ly/2LsBWHO>). It is about finding mean, median and mode. (Watch and trim the video clip as per lesson required).

Non-contact teaching and learning

- Prepare a video on steps involved in collecting data and share it to the students (touch the following areas in your videos).
 - Identifying situations to collect data.
 - Formulating data collection tools (survey questionnaires).

- Generating samples using random sampling avoiding bias.
- Collecting data using developed tools.
- Organizing collected data in tabular form.
- Describing the data in the table.
- Or prepare a PowerPoint presentation on steps involved in collecting data and share it to the students.
- Then students identify on what topic/problem they should be collecting data or teacher provide them the topic. Then, let them collect data using questionnaires.
- Prepare a video on mean, median, and mode and share it to the students via social media (WeChat, telegram, Google Classroom). or
- Use this video link (<https://bit.ly/2LsBWHO>). It is about finding mean, median and mode. (Watch and trim the video clip as per lesson required).
- Let students explore lessons on mean, median and mode in SIM class VI, volume 3.

C. Assessment

Contact

Performance task 1

- Let students collect the data in group using the developed tools and organize in the tabular form. Then let students describe the data.

Performance task 2

- Let students find mean, median, and mode (Refer questions from Mathematics textbook cl. VI).

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students collect the data on the chosen topic and using questionnaires and organize in the tabular form. Then let students describe the data.
(Students take a picture of their task and send it for assessment).

Performance task 2

- Let students find mean, median, and mode (Refer questions from Mathematics textbook cl. VI).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook for class VI
- b) Teacher's Manual for class VI
- c) Online resources

<https://bit.ly/2LsBWHO>

Non-contact

- a) Textbook and guide book (Class VI Mathematics)
- b) video on steps involved in collecting data
- c) SIM class VI, volume 3
- d) Internet
- e) Online resources

<https://bit.ly/2LsBWHO>

E. Annexure(s):

Refer VI-A1 for Template to record assessment

Topic: VI-E3 Data Representation

A. Competencies

- Construct and interpret line graph, bar graph and double bar graphs using intervals.
- Plot stem and leaf plots to display grouped numerical data.

Objectives

- Construct line graphs from collected data.
- Describe that the purpose of a line graph is to focus on trends implicit in the data (e.g. for temperature).
- Construct and interpret bar graphs and double bar graphs using intervals.
- Display the data using stem and leaf plot.

B. Pedagogy

Contact teaching and learning

- Have students look at the double bar graph in the student text. Ask them to indicate some of the things that the bar graph shows. Make sure they recall how double bar graphs are created and in what situations they are used.
- Collect and organize the numerical data (for double bar graph and line graph).
- Use data to construct double bar graphs and line graphs.
- Interpret bar graph and double bar graphs.
- Interpret a line graph and look for trends in the data.
- Use Ms excel (or other relevant ICT tools) to construct bar graphs, double bar graphs and line graphs.
- Discuss, collect and record any data (e.g. height of the students).
- Display the collected data in stem and leaf plot (demonstrate how to prepare stem and leaf plot).
- Use this video link (https://www.youtube.com/watch?v=_7m0Q_m2ppg). It is about preparing stem and leaf plot. (*Watch and trim the video clip as per lesson required*).

Non-contact teaching and learning

- Prepare a PowerPoint presentation on constructing line graphs and line graphs and share it to the students via social media (WeChat, telegram, Google Classroom).
- This video link is about constructing double bar graph (<https://www.youtube.com/watch?v=L5g1y7oJhuw&t=231s>). (*Watch and trim the video clip as per lesson required*).

- This video link is about constructing line graph (<https://www.youtube.com/watch?v=OTDNPnsF9TA&t=139s>). (Watch and trim the video clip as per lesson required).
- Prepare a video on stem and leaf plot and share it to the students via social media (WeChat, telegram, Google Classroom). or
- Use this video link (https://www.youtube.com/watch?v=_7m0Q_m2ppg). It is about preparing stem and leaf plot. (*Watch and trim the video clip as per lesson required*).

C. Assessment

Contact

Performance task 1

- Discuss and collect the data and let students construct double bar graph. Let them also interpret the graph.

Performance task 2

- Provide a set of data and let students construct line graphs. Let them study the trend in the graph.

Performance task 3

- Let students carry out tasks on stem and leaf plot (Use Mathematics textbook cl. VI).

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Provide a set of data and let students construct a double bar graph and a line graph. Let them also interpret the graphs.

Performance task 2

- Let students carry out tasks on stem and leaf plot (Use Mathematics textbook cl. VI). (*Students take a picture of their task and send it for assessment*).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook for class VI
- b) Teacher's Manual for class VI
- c) ICT Tools
- d) Online resources
https://www.youtube.com/watch?v=_7m0Q_m2ppg

Non-contact

- a) Student textbook for class VI
- b) Teacher's Manual for class VI
- c) video on steps involved in collecting data
- d) Internet
- e) Online resources
<https://www.youtube.com/watch?v=L5g1y7oJhuw&t=231s>
<https://www.youtube.com/watch?v=OTDNPnsF9TA&t=139s>
https://www.youtube.com/watch?v=_7m0Q_m2ppg

E. Annexure(s)

Refer VI-A1 for Template to record assessment

Topic: VI-E4 Plotting Coordinates

A. Competencies

- Demonstrate the ability to plot coordinates in all four quadrants.

Objectives

- Explain the application of coordinate graphs (describing location and in navigation).
- Plot ordered pairs in all four quadrants of coordinate graphs using appropriate labels and scales.
- Use an ordered pair of vertices of a given polygon to draw on a coordinate graph.

B. Pedagogy

Contact teaching and learning

- Pre-assessment (Example: draw a coordinate grid on the board and ask students where to plot several points, e.g., (3, 5), (5, 3), and (2, 4).
- Explain the application of coordinate graphs (e.g. describing location and in navigation).
- Introduce a grid showing all four quadrants. Ask students to name a point they think is located in each of the quadrants.
- Demonstrate how to plot the coordinates on the grid in all the four quadrants.
- Use an ordered pair of vertices of a given polygon to draw on a coordinate graph.
- This video link (<https://bit.ly/3cRk4S8>) is about plotting points on the coordinate grid. (Watch and trim the video clip as per lesson required).

Non-contact teaching and learning

- Prepare a video on coordinates points (introduce a grid showing all four quadrants) and share it to the students via social media (WeChat, telegram, Google Classroom). or
Use this video link (<https://bit.ly/3cRk4S8>). It is about plotting points in the coordinate grid. (Watch and trim the video clip as per lesson required).

C. Assessment

Contact

Performance task 1

- Let students name points in all the four quadrants (Refer questions from Mathematics textbook cl. VI).

Performance task 2

- Let students plot the given points (Refer questions from Mathematics textbook cl. VI).

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students name points in all the four quadrants (Refer questions from Mathematics textbook cl. VI).

Performance task 2

- Let students plot the given points (Refer questions from Mathematics textbook cl. VI).

(Students take a picture of their task and send it for assessment).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- a) Textbook for class VI
- b) Teacher's Manual for class VI
- c) Online resources
<https://bit.ly/3cRk4S8>

Non-contact

- a) Student textbook for class VI
- b) Teacher's Manual for class VI
- c) Internet
- d) Online resources
<https://bit.ly/3cRk4S8>

E. Annexure(s)

Refer VI-A1 for Template to record assessment

Topic: VI-E5 Determine Theoretical Probability

A. Competencies

- Demonstrate the ability to describe that the theoretical probability is the number of favourable outcomes divided by the number of possible.
- Demonstrate the ability to identify events that might be associated with a particular theoretical probability.

Objectives

- Define theoretical probability.
- Use percentage and decimals to describe probabilities.

B. Pedagogy

Contact teaching and learning

- Ask the following questions:
 - What numbers are the multiples of 5? (5, 10, 15, 20,)
 - How many multiples of 5 are there between 1 and 100? (There are 20.)
 - How does that help you calculate the probability? (20 numbers out of 100 are multiples of 5, so use the fraction 20/100).
- Explain theoretical probability and show how to find theoretical probability.
- Use this video link (<https://bit.ly/3juGLNe>). It is about theoretical probability. (Watch and trim the video clip as per lesson required).
- Provide some examples of situations where probabilities are given as fractions, decimals, or percent.
- Explain with examples on how to create an event for each theoretical probability.

Non-contact teaching and learning

- Prepare a video lesson on theoretical probability and share it to the students via social media (WeChat, telegram, Google Classroom). or.
- Use this video link about theoretical probability (<https://bit.ly/3juGLNe>). (Watch and trim the video clip as per lesson required).
- Let students explore on theoretical probability in SIM class VI, volume 4.

C. Assessment

Contact

Performance task 1

- Let students find theoretical probability (Refer questions from Mathematics textbook cl. VI). Then, let them use percentage and decimals to describe probabilities.

Performance task 2

- Let students create an event for the theoretical probability. (Refer questions from Mathematics textbook cl. VI).

Design appropriate assessment tool and record the student learning based on the template in the annexure

Non-contact

Performance task 1

- Let students find theoretical probability (Refer questions from Mathematics textbook cl. VI). Then, let them use percentage and decimals to describe probabilities.

Performance task 2

- Let students create an event for the theoretical probability. (Refer questions from Mathematics textbook cl. VI). (*Students take a picture of their task and send it for assessment*).

Design appropriate assessment tool and record the student learning based on the template in the annexure

D. Resources

Contact

- Textbook for class VI
- Teacher's Manual for class VI
- Online resources
 - <https://bit.ly/3juGLNe>

Non-contact

- Student textbook for class VI
- Teacher's Manual for class VI
- SIM Class VI, Volume 4
- Internet
- Online resources
 - <https://bit.ly/3juGLNe>

E. Annexure(s)

Refer VI-A1 for Template to record assessment