



Curriculum of MEP
Baan Sankamphaeng School
B.E. 2025

According to the core curriculum of basic education B.E. 2008
(Revised B.E. 2017)

Maths

MEP (Mini English Program)
Baan Sankamphaeng School

Chiang Mai Primary Educational Service Area Office, Area 1

Preface

Ban Sankamphaeng School serves as a model school in implementing the Basic Education Core Curriculum B.E. 2008 (Revised Edition B.E. 2017). The school has developed its own curriculum for Mathematics Learning Area at the primary education level, B.E. 2568, based on the vision, principles, goals, core competencies, desirable characteristics, learning standards, indicators, and guidelines for measurement and evaluation outlined in the Basic Education Core Curriculum B.E. 2551 (Revised Edition B.E. 2560). These elements serve as the guiding framework for curriculum development and instructional management to enhance students' knowledge, skills/processes, and desirable characteristics necessary for living in a rapidly changing society and for pursuing lifelong self-development.

In B.E. 2568, the school revised its curriculum structure to ensure relevance and alignment with the Ministry of Education's policies, key focuses, as well as the context, vision, and instructional practices of modern international standard schools.

We would like to express our sincere gratitude to the Ban San Kamphaeng School Board, student guardians, and all stakeholders for their valuable advice and support in the development of the Mathematics Learning Area Curriculum for the primary level, B.E. 2568. Your contributions have been vital in helping us shape a curriculum that fulfills the intentions of the Basic Education Core Curriculum B.E. 2551 (Revised Edition B.E. 2560) and promotes the development of quality learners.

Producers

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Vision

Our school lives up to international standards. Focuses on learning to generate creativity. Our students can communicate using the technology for virtue, art and culture.

Principles

The Ban San Kamphaeng School Curriculum B.E. 2568, developed in accordance with the Basic Education Core Curriculum B.E. 2551 (Revised Edition B.E. 2560), is designed to be inclusive of all target groups. It allows for the transfer and recognition of learning outcomes and experiences. The curriculum is founded upon the following key principles:

1. The ultimate aim is attainment of national unity; learning standards and goals are therefore set with a view to enabling the children and youths to acquire knowledge, skills, attitude and morality to serve as a foundation for Thai-ness and universal values.
2. The curriculum facilitates education for all, who have equal access to education of high quality.
3. The curriculum facilitates decentralisation of authority by allowing society to participate in educational provision, which suits prevailing situations and serves local needs.
4. Structure of the curriculum enjoys flexibility regarding learning contents, time allotment and learning management.
5. The learner-centred approach is strongly advocated.
6. The curriculum is intended for education of all types—formal, non-formal and informal, covering all target groups and facilitating transfer of learning outcomes and experiences.

Goals

Baan San Kamphaeng School 2009 (Updated 2017) According to Core Curriculum, Basic Education 2008 aims to develop learners into good people with wisdom, happiness and potential for further study, and occupation. It is a destination for students. The following goals have consequently been set for achievement upon completing basic education:

1. Morality, ethics, desirable values, self-esteem, self-discipline, observance of Buddhist teachings or those of one's faith, and guiding principles of Sufficiency Economy;
2. Knowledge and skills for communication, thinking, problem-solving, technological know-how, and life skills;
3. Good physical and mental health, hygiene, and preference for physical exercise;
4. Patriotism, awareness of responsibilities and commitment as Thai citizens and members of the world community, and adherence to a democratic way of life and form of government under constitutional monarchy; and
5. Awareness of the need to preserve all aspects of Thai culture and Thai wisdom, protection and conservation of the environment, and public-mindedness with dedication to public service for peaceful and harmonious co-existence.

Key Competencies and Desirable Characteristics

In the development of learners according to the Baan San Kamphaeng School curriculum, 2009 (Update 2017), according to the core curriculum of Basic Education 2008, the students should focus on developing the learners to meet the quality standards. This will help learners to achieve key performance and desired attributes;

Learners' Key Competencies

Baan San Kamphaeng School 2009 (Updated 2017) According to Core Curriculum. The Basic Education Core Curriculum is aimed at inculcating among learners the following five key competencies:

1. Communication Capacity

Capacity to receive and transmit information; linguistic ability and skills in expressing one's thoughts, knowledge and understanding, feelings and opinions for exchanging information and experience, which will be beneficial to oneself and society; negotiation for solving or reducing problems and conflicts; ability to distinguish and choose whether to receive or avoid information through proper reasoning and sound judgement; and ability to choose efficient methods of communication, bearing in mind possible negative effects on oneself and society.

2. Thinking Capacity

Capacity for analytical, synthetic, constructive, critical and systematic thinking, leading to creation of bodies of knowledge or information for judicious decision-making regarding oneself and society.

3. Problem-Solving Capacity

Capacity to properly eliminate problems and obstacles, based on sound reasoning, moral principles and accurate information; appreciation of relationships and changes in various social situations; ability to seek and apply knowledge to prevent and solve problems; and ability for judicious decision-making, bearing in mind possible negative effects on oneself, society and the environment.

4. Capacity for Applying Life Skills

Capacity for applying various processes in daily life; self-learning; continuous learning; working; and social harmony through strengthening of happy interpersonal relationships; elimination of problems and conflicts through proper means; ability for self-adjustment to keep pace with social and environmental changes; and capacity for avoiding undesirable behaviour with adverse effects on oneself and others.

5. Capacity for Technological Application

Ability to choose and apply different technologies; skills in application of technological processes for development of oneself and society in regard to learning, communication, working, and problem-solving through constructive, proper, appropriate and ethical means.

Desirable Characteristics

The Basic Education Core Curriculum focuses on learners' development for attainment of the following desirable characteristics, enabling learners to enjoy a life of harmony among others as Thai citizens and global citizens:

1. Love of nation, religion and king
2. Honesty and integrity
3. Self-discipline
4. Avidity for learning
5. Observance of principles of Sufficiency Economy Philosophy in one's way of life
6. Dedication and commitment to work
7. Cherishing Thai-ness
8. Public-mindedness

Learning Area of Mathematics

Why it is necessary to learn mathematics

Mathematics is highly important to development of the human mind. It enables a person to acquire skills in creativity, logic and systematic and methodical thinking, and allows one to carefully and thoroughly analyse various problems or situations, anticipate, plan, make decisions, solve problems and accurately and appropriately apply mathematics in daily life. Mathematics serves as a tool for learning science, technology and other disciplines. It is therefore useful to one's life, enhances quality of life and enables a person to live in harmony with others.

What is learned in mathematics?

The learning area for mathematics is aimed at enabling all children and youths to continuously learn this subject in accord with their potentiality. The contents prescribed for all learners are as follow:

Numbers and Operations: numerical concepts and sense of perception; real number system; properties of real numbers; operation of numbers; ratio; percentage; problem-solving involving numbers; and application of numbers in real life

Measurement: length; distance; weight; area; volume and capacity; money and time; measuring units; estimation for measurement; trigonometric ratio; problem-solving regarding measurement; and application of measurement in various situations

Geometry: geometric figures and properties of one-dimensional geometric figures; visualization of geometric models; geometric theories; and geometric transformation through translation, reflection and rotation

Algebra: pattern; relationship; function; sets and their operations; reasoning; expression; equation; equation system; inequality; graph; arithmetic order; geometric order; arithmetic series; and geometric series

Data Analysis and Probability: determining an issue; writing questions; determining methods of study; study; data collection, systematization and presentation; central tendency and data distribution; data analysis and interpretation; opinion polling; probability; application of statistical knowledge and probability; application of probability in explaining various situations as well as for facilitating decision-making in real life

Mathematical Skills and Processes: problem-solving through diverse methods; reasoning; communication; communication and presentation of mathematical concepts; linking mathematics with other disciplines; and attaining ability for creative thinking

Learners' Quality

Grade 3 graduates

1. Have numerical knowledge, understanding and sense of cardinal numbers not more than 100,000, and zero as well as operation of numbers; can solve problems involving addition, subtraction, multiplication and division; and are aware of validity of the answers reached
2. Have knowledge and understanding of length, distance, weight, volume, capacity, time and money; can measure correctly and appropriately; and can apply knowledge of measurement for solving problems faced in various situations
3. Have knowledge and understanding of triangle, quadrilateral, circle, ellipse, cuboid, sphere and cylinder as well as point, line segment and angle
4. Have knowledge and understanding of pattern and can explain relationship
5. Can collect and analyse relevant data and information about themselves and their surroundings in their daily lives; can avail of pictograms and bar charts for discussing various issues
6. Can apply diverse methods for problem-solving; can avail of mathematical knowledge, skills and processes appropriately for solving problems faced in various situations; can suitably present reasoning for decision-making and appropriately present the conclusion reached; can use mathematical language and symbols for communication, as well as accurate and appropriate communication and presentation of mathematical concepts; can link various bodies of mathematical knowledge; can link mathematics with other disciplines; and have attained ability for creative thinking

Grade 6 graduates

1. Have numerical knowledge, understanding, and sense of cardinal numbers and zero, fractions, decimals of not more than three places, percentages, operation of numbers and properties of numbers; can solve problems involving addition, subtraction multiplication and division of cardinal numbers, fractions, decimals of not more than three places and percentages; are aware of validity of the answers reached; and can find estimates of cardinal numbers and decimals of not more than three places.
2. Have knowledge and understanding of length, distance, weight, area, volume, capacity, time, money, direction, diagrams and size of angles; can measure correctly and appropriately; and can apply knowledge of measurement for solving problems faced in various situations
3. Have knowledge and understanding of characteristics and properties of triangles, squares, circles, cuboids, cylinders, cones, prisms, pyramids angles and parallel lines
4. Have knowledge and understanding of patterns and can explain their relationships and solve problems involving patterns; can analyse situations or problems as well as write linear equations with an unknown that can be solved.
5. Can collect data and information and discuss various issues from pictograms, bar charts, comparative bar charts, pie charts, line graphs and tables that are availed of for presentation; and can apply knowledge of basic probability in projecting various possible situations.

6. Can apply diverse methods for problem-solving, availing of mathematical and technological knowledge, skills, and processes appropriately to solve problems faced in various situations; can suitably provide reasoning for decision-making and appropriately present the conclusions reached; can use mathematical language and symbols for communication as well as accurate and appropriate communication and presentation of mathematical concepts; can link various bodies of mathematical knowledge and can link mathematical knowledge with other disciplines; and have attained ability for creative thinking.

Strands and Learning Standards

Strand 1: Numbers and Algebra

Standard M 1.1: Understand various representations of numbers, number systems, operations on numbers, the results and properties of operations, and apply them appropriately.

Standard M 1.2: Understand and analyze patterns, relations, functions, sequences, and series, and apply them.

Standard M 1.3: Use expressions, equations, inequalities, and matrices to describe relationships or solve given problems.

Note: Standard M 1.3 applies to students in Grades 7–12 (Mathayom 1–6).

Strand 2: Measurement and Geometry

Standard M 2.1: Understand measurement fundamentals; measure and estimate the size of objects, and apply such knowledge.

Standard M 2.2: Understand and analyze geometric figures, their properties, relationships among figures, geometric theorems, and apply them.

Standard M 2.3: Understand analytic geometry and apply it.

Standard M 2.4: Understand vectors, vector operations, and apply them.

Note: Standards M 2.1 and M 2.2 apply to students in Grades 1–9 (Prathom 1–Mathayom 3).

Standards M 2.3 and M 2.4 apply to students in Grades 10–12 (Mathayom 4–6) in science-oriented programs.

Strand 3: Statistics and Probability

Standard M 3.1: Understand statistical processes and use statistical knowledge to solve problems.

Standard M 3.2: Understand basic counting principles and probability, and apply them.

Note: Standard M 3.2 applies to students in Grades 7–12 (Mathayom 1–6).

Student Competencies

Upon Completion of Grade 3 (Prathom 3)

- Able to read and write numerals and number words up to 100,000 and zero; demonstrate number sense, and perform addition, subtraction, multiplication, and division with the ability to apply these skills in various situations.
- Demonstrate number sense related to fractions not exceeding one; perform addition and subtraction of fractions with the same denominators and apply them in real-life contexts.
- Estimate and measure length, weight, volume, and capacity; select appropriate tools and units; tell time and count money; and apply these skills in various situations.
- Identify and describe the characteristics of polygons, circles, ovals, rectangular prisms, spheres, cylinders, and cones; draw polygons, circles, and ovals using given templates; identify symmetrical shapes and lines of symmetry; and apply this knowledge in real-life contexts.
- Read and write picture graphs and single-variable tables, and apply this information in different situations.

- Upon Completion of Grade 6 (Prathom 6)
- Able to read and write numerals and number words representing whole numbers, fractions, and decimals (up to three decimal places), ratios, and percentages; demonstrate number sense; perform the four arithmetic operations and estimation, and apply them in various real-life situations.
- Explain properties and characteristics of geometric figures; calculate perimeter and area of plane figures; construct triangles, quadrilaterals, and circles; calculate volume and capacity of rectangular prisms; and apply these skills in daily life.
- Present data using bar graphs; interpret data from bar graphs, pie charts, double-entry tables, and line graphs to explain events and make informed decisions.

Strand 1: Numbers and Operations

Standard M1.1: Understanding diverse methods of presenting numbers and their application in real life

Grade level indicators					
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
1. Write and read Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers not exceeding 100, and 0. 2. Compare and arrange sequence of cardinal numbers not exceeding 100, and 0.	1. Write and read Hindu-Arabic and Thai numerals and written forms showing quantity of objects or cardinal numbers not exceeding 1,000, and 0. 2. Compare and arrange sequence of cardinal numbers not exceeding 1,000, and 0.	1. Write and read Hindu-Arabic and Thai numerals and written forms showing quantity of objects or cardinal numbers not exceeding 100,000, and 0. 2. Compare and arrange sequence of cardinal numbers not exceeding 100,000, and 0.	1. Write and read Hindu-Arabic and Thai numerals and written forms showing cardinal numbers, 0, fractions, and one-place decimals. 2. Compare and arrange sequence of cardinal numbers and 0, fractions, and one-place decimals.	1. Write and read fractions, mixed numbers and decimals with not more than 2 places. 2. Compare and arrange sequence of fractions and decimals with not more than 2 places. 3. Write fractions in decimal form and percentages; write	1. Write and read decimals with not more than 3 places. 2. Compare and arrange sequence of fractions and decimals with not more than 3 places. 3. Write decimals in the form of fractions and write fraction in form of decimal.

Grade level indicators					
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
				percentages in the forms of fractions and decimals, and write decimals in the forms of fractions and percentages.	

Strand 1: Numbers and Operations

Standard M1.2: Understanding results of operations of numbers, relationships of operations, and application of operations for problem-solving

Grade level indicators					
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
1. Add, subtract and mix addition and subtraction of cardinal numbers not exceeding 100, and 0, as well as be aware of validity of the answers. 2. Analyse and find answers to problems and mix-problems of cardinal numbers not exceeding 100, and 0, as well as be aware of validity of the answers.	1. Add, subtract and mix addition and subtraction of cardinal numbers not exceeding 1,000, and 0, as well as be aware of validity of the answers. 2. Analyse and find answers to problems and mix-problems of cardinal numbers not exceeding 1,000, and 0, as well as be aware of validity of the answers.	1. Add, subtract and mix addition and subtraction of cardinal numbers not exceeding 100,000, and 0, as well as be aware of validity of the answers. 2. Analyse and show method of finding answers to problems and mix-problems of cardinal numbers not exceeding 100,000, and 0, as well as be aware of validity of the answers.	1. Add, subtract and mix addition, subtraction, multiplication and division of cardinal numbers and 0, as well as be aware of validity of the answers. 2. Analyse and show method of finding answers to problems and mix-problems of cardinal numbers and 0, as well as be aware of validity of the answers, and be able to construct problems. 3. Add and subtract fractions with same denominator.	1. Write and read fractions, mixed numbers and decimals with not more than 2 places. 2. Compare and arrange sequence of fractions and decimals with not more than 2 places. 3. Write fractions in decimal form and percentages; write percentages in the forms of fractions and decimals, and write decimals in the forms of fractions and percentages.	1. Write and read decimals with not more than 3 places. 2. Compare and arrange sequence of fractions and decimals with not more than 3 places. 3. Write decimals in the form of fractions and write fraction in form of decimal.

Strand 1: Numbers and Operations

Standard M1.3: Use of estimation in calculation and problem-solving

Grade level indicators					
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
-	-	-	-	1. Make approximate estimates of integers of 10, 100 and 1,000 of cardinal numbers, which can be applied.	1. Make approximate estimates of various integers of cardinal numbers, which can be applied. 2. Make estimates of decimals of not more than 3 places.

Strand 1: Numbers and Operations

Standard M1.4: Understanding of numerical system and application of numerical properties

Grade level indicators					
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
-	-	-	-	-	1. Use communicative, associative and distributive properties in calculation. 2. Find highest common factor (H.C.F.) and lowest common multiples (L.C.M.) of cardinal numbers. decimals of not more than 3 places.

Strand 2: Measurement

Standard M2.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Grade level indicators					
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
1. Tell length, weight, volume, and capacity by using non-standard units of measure.	1. Tell length in metres and centimetres, and compare length by using the same unit. 2. Tell weight in kilogrammes and	1. Tell length in metres, centimetres and millimetres by using appropriate measuring tools, and compare length.	1. Tell the relationship between measuring units for length, weight, volume or capacity and time.	1. Tell the relationship between measuring units for length, weight and volume or capacity.	1. Explain a route or indicate positions of various objects by specifying direction and real distance from pictures,
2. Tell period of time, number and names of days of the week.	grammes, and compare weight by using the same unit. 3. Tell volume and capacity in litres, and compare volume and capacity. 4. Tell total amount of money from coins and bank notes. 5. Tell the time on a clock dial (period of 5 minutes). 6. Tell the days, months and year from a calendar.	2. Tell weight in kilogrammes and grammes by using appropriate weighing machine, and compare weights. 3. Tell volume and capacity in litres and millilitres by using appropriate measuring tools, and compare weight and capacity by using the same units. 4. Tell the time on a clock dial (period of 5 minutes); read, write and tell the	2. Find area of rectangle. 3. Tell the time on a clock dial; read and write the time by using numerals; and tell length of time. 4. Estimate length, weight and volume or capacity.	2. Find the perimeter of quadrilaterals and triangles. 3. Find the area of rectangles and triangles. 4. Measure the size of angle. 5. Find volume or capacity of cuboids.	maps and diagrams. 2. Find the area of quadrilateral. 3. Find the circumference and area of circles.

Grade level indicators					
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
		time by using numerals. 5. Tell the relationship between measuring units for length, height and time. 6. Read and write amount of money by using numerals.			

Strand 2: Measurement

Standard M2.2: Solving measurement problems

Grade level indicators					
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
-	1. Solve problems involving measurement of length, weight, volume and money.	1. Solve problems involving measurement of length, weight, volume, money and time. 2. Read and keep record of income and expenditure. 3. Read and keep record of activities or events, specifying the time.	1. Solve problems involving measurement of length, weight, volume, money and time. 2. Read and keep record of income and expenditure. 3. Read and keep record of activities or events, specifying the time.	1. Solve problems involving area and perimeter of quadrilaterals and triangles.	1. Solve problems involving area and perimeter of quadrilaterals and circles. 2. Solve problems involving volume and capacity of cuboids. 3. Draw diagrams showing positions of various objects and diagrams showing travel routes.

Strand 3: Geometry

Standard M3.1: Ability to explain and analyse two-dimensional and three-dimensional geometric figures.

Grade level indicators					
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
1. Distinguish triangles, quadrilaterals, circles and ellipses.	1. Identify two-dimensional geometric figures whether in the form of triangles, quadrilaterals, circles or ellipses. 2. Identify three-dimensional figures whether in the form of cuboids, spheres or cylinders. 3. Distinguish between rectangles and cuboids, and between circles and spheres.	1. Identify two-dimensional geometric figures that are components of an object in the form of a three-dimensional geometric figure. 2. Identify two-dimensional geometric figures with axis of symmetry from a given figure. 3. Write linear points, straight lines, rays, parts of straight lines, angles and symbols.	1. Identify kind, name and components of angles and write symbols. 2. Can identify which pair of straight lines or parts of straight lines form a parallel, as well as use symbols to indicate kind of parallel. 3. Identify components of a circle. 4. Can identify which figure or which part of an object has the form of a rectangle, and can identify whether it is a square or a rectangle. 5. Can identify which two-	1. Identify characteristics and differentiate between various kinds of three-dimensional geometric figures. 2. Identify characteristics, relationship and differentiate between various kinds of quadrilaterals. 3. Identify characteristics, components, relationships and differentiate between various kinds of triangles.	1. Identify kinds of two-dimensional geometric figures that are components of three-dimensional geometric figures. 2. Identify characteristics of diagonals in various kinds of quadrilaterals. 3. Identify which pair of straight lines is parallel.

Grade level indicators					
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
			dimensional geometric figures have axes of symmetry, and identify the number of axes.		

School Curriculum Structure

Structure and Time Rate of Learning Management (Regular Classroom, Academic Year
2025) Ban San Kamphaeng School Educational Institution Curriculum, 2025
According to the Basic Education Core Curriculum, B.E. 2551 (revised version B.E. 2560)

Learning subjects/activities	class time					
	elementary school					
	P.1	P.2	P.3	P.4	P.5	P.6
Learning subject group						
Thai language	200	200	200	160	160	160
Mathematics	200	200	200	160	160	160
science and technology	80	80	80	120	120	120
Social Studies, Religion and Culture	40	40	40	80	80	80
History	40	40	40	40	40	40
Health and Physical Education	80	80	80	80	80	80
Art	40	40	40	40	40	40
Career	40	40	40	40	40	40
foreign language	120	120	120	120	120	120
Total class time (basic)	840	840	840	840	840	840
Additional courses	120	120	120	80	80	80
Knowledge Inquiry (KI)	-	-	-	40	40	40
Chinese	40	40	40	40	40	40
English for Communication	80	80	80	-	-	-
Student development activities						
1. Guidance activities	120	120	120	120	120	120
2. Student activities Boy Scouts – Girl Scouts	30	30	30	30	30	30
3. Assembly activities	40	40	40	40	40	40
4. Social activities and public interest	10	10	10	10	10	10
Extra-curricular activities	120	120	120	160	160	160
Learning activities to create with wisdom	40	40	40	80	80	80
Aesthetic promotion activities	40	40	40	40	40	40
Activities to promote skills in the use of technology media	40	40	40	40	40	40
Total study time	1,200 hours/year					

School curriculum structure (regular classroom, academic year 2025) Grade 1

course/activity	Study time (hours/year)
basic course	840
TH 11101 Thai language	200
M 11101 Mathematics	200
SC 11101 Science and Technology	80
SO 11101 Social Studies, Religion and Culture	40
SO 11102 History	40
HP 11101 Health and Physical Education	80
AR 11101 art	40
OC 11101 Occupation	40
EN 11101 English	120
additional courses	120
CH 11201 Chinese	40
EN 11202 English for Communication	80
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
total class time	1,200 hours/year

School curriculum structure (regular classroom, academic year 2025)

Grade 2

course/activity	Study time (hours/year)
basic course	840
TH 12101 Thai language	200
M 12101 Mathematics	200
SC 12101 Science and Technology	80
SO 12101 Social Studies, Religion and Culture	40
SO 12102 History	40
HP 12101 Health and Physical Education	80
AR 12101 art	40
OC 12101 Occupation	40
EN 12101 English	120
additional courses	120
CH 12201 Chinese	40
EN 12202 English for Communication	80
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
total class time	1,200 hours/year

school curriculum structure (regular classroom, academic year 2025)

Grade 3

course/activity	Study time (hours/year)
basic course	840
TH 13101 Thai language	200
M 13101 Mathematics	200
SC 13101 Science and Technology	80
SO 13101 Social Studies, Religion and Culture	40
SO 13102 History	40
HP 13101 Health and Physical Education	80
AR 13101 art	40
OC 13101 Occupation	40
EN 13101 English	120
additional courses	120
CH 13201 Chinese	40
EN 13202 English for Communication	80
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
total class time	1,200 hours/year

school curriculum structure (regular classroom, academic year 2025)

Grade 4

course/activity	Study time (hours/year)
basic course	840
TH 14101 Thai language	160
M 14101 Mathematics	160
SC 14101 Science and Technology	120
SO 14101 Social Studies, Religion and Culture	80
SO 14102 History	40
HP 14101 Health and Physical Education	80
AR 14101 art	40
OC 14101 Occupation	40
EN 14101 English	120
additional courses	80
I14201 Knowledge Inquiry	40
CH 14202 Chinese	40
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
Extra-curricular activities	160
Learning activities to create with wisdom	80
Aesthetic promotion activities	40
Activities to promote skills in the use of technology media	40
Total class time	1,200 hours /year

school curriculum structure (regular classroom, academic year 2025)

Grade 5

course/activity	Study time (hours/year)
basic course	840
TH 15101 Thai language	160
M 15101 Mathematics	160
SC 15101 Science and Technology	120
SO 15101 Social Studies, Religion and Culture	80
SO 15102 History	40
HP 15101 Health and Physical Education	80
AR 15101 art	40
OC 15101 Occupation	40
EN 15101 English	120
additional courses	80
I 14201 Knowledge Inquiry	40
CH 14202 Chinese	40
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
Extra-curricular activities	160
Learning activities to create with wisdom	80
Aesthetic promotion activities	40
Activities to promote skills in the use of technology media	40
Total class time	1,200 hours /year

school curriculum structure (regular classroom, academic year 2025)

Grade 6

course/activity	Study time (hours/year)
basic course	840
TH 16101 Thai language	160
M 16101 Mathematics	160
SC 16101 Science and Technology	120
SO 16101 Social Studies, Religion and Culture	80
SO 16102 History	40
HP 16101 Health and Physical Education	80
AR 16101 art	40
OC 16101 Occupation	40
EN 16101 English	120
additional courses	80
I 16201 Knowledge Inquiry	40
CH 16202 Chinese	40
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
Extra-curricular activities	160
Learning activities to create with wisdom	80
Aesthetic promotion activities	40
Activities to promote skills in the use of technology media	40
Total class time	1,200 hours /year

Structure and Time Rate of Learning Management (MEP Program , Academic Year 2025)

Ban San Kamphaeng School Educational Institution Curriculum, 2025

According to the Basic Education Core Curriculum, B.E. 2551 (revised version B.E. 2560)

Learning subjects/activities	class time					
	elementary school					
	P.1	P.2	P.3	P.4	P.5	P.6
Learning subject group						
Thai language	200	200	200	160	160	160
Mathematics	200	200	200	160	160	160
science and technology	80	80	80	120	120	120
Social Studies, Religion and Culture	40	40	40	80	80	80
History	40	40	40	40	40	40
Health and Physical Education	80	80	80	80	80	80
Art	40	40	40	40	40	40
Career	40	40	40	40	40	40
foreign language	120	120	120	120	120	120
Total class time (basic)	840	840	840	840	840	840
Additional courses	120	120	120	80	80	80
Knowledge Inquiry (KI) (Grade 4, 5, 6)	-	-	-	40	40	40
Chinese	40	40	40	40	40	40
English for Communication	80	80	80	-	-	-
Student development activities						
1. Guidance activities	120	120	120	120	120	120
2. Student activities Boy Scouts – Girl Scouts	30	30	30	30	30	30
3. Assembly activities	40	40	40	40	40	40
4. Social activities and public interest	10	10	10	10	10	10
Extra-curricular activities	120	120	120	160	160	160
Learning activities to create with wisdom	40	40	40	80	80	80
Aesthetic promotion activities	40	40	40	40	40	40
Activities to promote skills in the use of technology media	40	40	40	40	40	40
Total study time	1,200 hours/year					

School curriculum structure (MEP Program, academic year 2025) Grade 1

course/activity	Study time (hours/year)
basic course	840
TH 11101 Thai language	200
M 11101 Mathematics	200
SC 11101 Science and Technology	80
SO 11101 Social Studies, Religion and Culture	40
SO 11102 History	40
HP 11101 Health and Physical Education	80
AR 11101 art	40
OT 11101 Occupation	40
FO 11101 English	120
additional courses	120
CH 11201 Chinese	40
EN 11202 English for Communication	80
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
total class time	1,200 hours/year

School curriculum structure (MEP Program, academic year 2025) Grade 2

course/activity	Study time (hours/year)
basic course	840
TH 12101 Thai language	200
M 12101 Mathematics	200
SC 12101 Science and Technology	80
SO 12101 Social Studies, Religion and Culture	40
SO 12102 History	40
HP 12101 Health and Physical Education	80
AR 12101 art	40
OT 12101 Occupation	40
FO 12101 English	120
additional courses	120
CH 12201 Chinese	40
EN 12202 English for Communication	80
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
total class time	1,200 hours/year

School curriculum structure (MEP Program, academic year 2025) Grade 3

course/activity	Study time (hours/year)
basic course	840
TH 13101 Thai language	200
M 13101 Mathematics	200
SC 13101 Science and Technology	80
SO 13101 Social Studies, Religion and Culture	40
SO 13102 History	40
HP 13101 Health and Physical Education	80
AR 13101 art	40
OT 13101 Occupation	40
FO 13101 English	120
additional courses	120
CH 13201 Chinese	40
EN 13202 English for Communication	80
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
total class time	1,200 hours/year

School curriculum structure (MEP Program, academic year 2025) Grade 4

course/activity	Study time (hours/year)
basic course	840
TH 14101 Thai language	160
M 14101 Mathematics	160
SC 14101 Science and Technology	120
SO 14101 Social Studies, Religion and Culture	80
SO 14102 History	40
HP 14101 Health and Physical Education	80
AR 14101 art	40
OT 14101 Occupation	40
FO 14101 English	120
additional courses	80
I 14201 Knowledge Inquiry	40
CH 14202 Chinese	40
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
Extra-curricular activities	160
Learning activities to create with wisdom	80
Aesthetic promotion activities	40
Activities to promote skills in the use of technology media	40
Total class time	1,200 hours /year

School curriculum structure (MEP Program, academic year 2025) Grade 5

course/activity	Study time (hours/year)
basic course	840
TH 15101 Thai language	160
M 15101 Mathematics	160
SC 15101 Science and Technology	120
SO 15101 Social Studies, Religion and Culture	80
SO 15102 History	40
HP 15101 Health and Physical Education	80
AR 15101 art	40
OT 15101 Occupation	40
FO 15101 English	120
additional courses	80
I 14201 Knowledge Inquiry	40
CH 14202 Chinese	40
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
Extra-curricular activities	160
Learning activities to create with wisdom	80
Aesthetic promotion activities	40
Activities to promote skills in the use of technology media	40
Total class time	1,200 hours /year

School curriculum structure (MEP Program, academic year 2025) Grade 6

course/activity	Study time (hours/year)
basic course	840
TH 16101 Thai language	160
M 16101 Mathematics	160
SC 16101 Science and Technology	120
SO 16101 Social Studies, Religion and Culture	80
SO 16102 History	40
HP 16101 Health and Physical Education	80
AR 16101 art	40
OT 16101 Occupation	40
FO 16101 English	120
additional courses	80
I 16201 Knowledge Inquiry	40
CH 16202 Chinese	40
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
Extra-curricular activities	160
Learning activities to create with wisdom	80
Aesthetic promotion activities	40
Activities to promote skills in the use of technology media	40
Total class time	1,200 hours /year

Structure and Time Rate of Learning Management (SMP Program, Academic Year 2025)

Ban San Kamphaeng School Educational Institution Curriculum, 2025

According to the Basic Education Core Curriculum, B.E. 2551 (revised version B.E. 2560)

Learning subjects/activities	class time					
	elementary school					
	P.1	P.2	P.3	P.4	P.5	P.6
Learning subject group						
Thai language	200	200	200	160	160	160
Mathematics	200	200	200	160	160	160
science and technology	80	80	80	120	120	120
Social Studies, Religion and Culture	40	40	40	80	80	80
History	40	40	40	40	40	40
Health and Physical Education	80	80	80	80	80	80
Art	40	40	40	40	40	40
Career	40	40	40	40	40	40
foreign language	120	120	120	120	120	120
Total class time (basic)	840	840	840	840	840	840
Additional courses	120	120	120	120	120	120
Knowledge Inquiry (KI)	-	-	-	40	40	40
Chinese	40	40	40	40	40	40
STEAM Education	80	80	80	40	40	40
Student development activities	120	120	120	120	120	120
1. Guidance activities	120	120	120	120	120	120
2. Student activities Boy Scouts – Girl Scouts	30	30	30	30	30	30
3. Assembly activities	40	40	40	40	40	40
4. Social activities and public interest	10	10	10	10	10	10
Extra-curricular activities	120	120	120	120	120	120
Learning activities to create with wisdom	40	40	40	40	40	40
Aesthetic promotion activities	40	40	40	40	40	40
Activities to promote skills in the use of technology media	40	40	40	40	40	40
technology media						
Total study time	1,200 hours/year					

School curriculum structure (SMP Program, academic year 2025) Grade 1

course/activity	Study time (hours/year)
basic course	840
TH 11101 Thai language	200
M 11101 Mathematics	200
SC 11101 Science and Technology	80
SO 11101 Social Studies, Religion and Culture	40
SO 11102 History	40
HP 11101 Health and Physical Education	80
AR 11101 art	40
OC 11101 Occupation	40
EN 11101 English	120
additional courses	120
CH 11201 Chinese	40
EN 13202 English for Communication	80
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
Extra-curricular activities	120
Learning activities to create with wisdom	40
Aesthetic promotion activities	40
Activities to promote skills in the use of technology media	40
total class time	1,200 hours/year

School curriculum structure (SMP Program, academic year 2025) Grade 2

course/activity	Study time (hours/year)
basic course	840
TH 12101 Thai language	200
M 12101 Mathematics	200
SC 12101 Science and Technology	80
SO 12101 Social Studies, Religion and Culture	40
SO 12102 History	40
HP 12101 Health and Physical Education	80
AR 12101 art	40
OT 12101 Occupation	40
FO 12101 English	120
additional courses	120
CH 11201 Chinese	40
EN 13202 English for Communication	80
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
Extra-curricular activities	120
Learning activities to create with wisdom	40
Aesthetic promotion activities	40
Activities to promote skills in the use of technology media	40
total class time	1,200 hours/year

School curriculum structure (SMP Program, academic year 2025) Grade 3

course/activity	Study time (hours/year)
basic course	840
TH 13101 Thai language	200
M 13101 Mathematics	200
SC 13101 Science and Technology	80
SO 13101 Social Studies, Religion and Culture	40
SO 13102 History	40
HP 13101 Health and Physical Education	80
AR 13101 art	40
OT 13101 Occupation	40
FO 13101 English	120
additional courses	120
CH 11201 Chinese	40
EN 13202 English for Communication	80
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
Extra-curricular activities	120
Learning activities to create with wisdom	40
Aesthetic promotion activities	40
Activities to promote skills in the use of technology media	40
total class time	1,200 hours/year

School curriculum structure (SMP Program, academic year 2025) Grade 4

course/activity	Study time (hours/year)
basic course	840
TH 14101 Thai language	160
M 14101 Mathematics	160
SC 14101 Science and Technology	120
SO 14101 Social Studies, Religion and Culture	80
SO 14102 History	40
HP 14101 Health and Physical Education	80
AR 14101 art	40
OT 14101 Occupation	40
FO 14101 English	120
additional courses	120
I 14201 Knowledge Inquiry	40
I 14201 Chinese	40
S 14203 STEAM Education	40
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
Extra-curricular activities	120
Learning activities to create with wisdom	40
Aesthetic promotion activities	40
Activities to promote skills in the use of technology media	40
total class time	1,200 hours/year

School curriculum structure (SMP Program, academic year 2025) Grade 5

course/activity	Study time (hours/year)
basic course	840
TH 15101 Thai language	160
M 15101 Mathematics	160
SC 15101 Science and Technology	120
SO 15101 Social Studies, Religion and Culture	80
SO 15102 History	40
HP 15101 Health and Physical Education	80
AR 15101 art	40
OT 15101 Occupation	40
FO 15101 English	120
additional courses	120
I 15201 Knowledge Inquiry	40
I 15201 Chinese	40
S 15203 STEAM Education	40
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
Extra-curricular activities	120
Learning activities to create with wisdom	40
Aesthetic promotion activities	40
Activities to promote skills in the use of technology media	40
total class time	1200 hours/year

School curriculum structure (SMP Program, academic year 2025) Grade 6

course/activity	Study time (hours/year)
basic course	840
TH 16101 Thai language	160
M 16101 Mathematics	160
SC 16101 Science and Technology	120
SO 16101 Social Studies, Religion and Culture	80
SO 16102 History	40
HP 16101 Health and Physical Education	80
AR 16101 art	40
OT 16101 Occupation	40
FO 16101 English	120
additional courses	120
I 16201 Knowledge Inquiry	40
I 16201 Chinese	40
S 16203 STEAM Education	40
Student development activities	120
1. Guidance	40
2. Scouts/ Scouts	30
3. Assembly activities	40
4. Social activities and public interest	10
Extra-curricular activities	120
Learning activities to create with wisdom	40
Aesthetic promotion activities	40
Activities to promote skills in the use of technology media	40
total class time	1200 hours/year

Course Description

Course Description

Basic Mathematics Course

Course Code: M11101

Grade 1

Time: 200 hours/Year

Write and read Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers not exceeding 100, and 0. Compare of cardinal numbers not exceeding 100, and 0. Using the $=$ $\neq$ $>$ $<$. Arrange Number sequence not exceeding 100 and $\circ$ from 3 to 5 number. Look for the value of the unknown value in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0. Show you how to find the answers to the problem of addition and find the answers to the problem of subtraction of the count not exceed 100 and 0. Specifies the number that is missing in the form of a number increases or decreases by 1 and 10 and identify the missing image in a repeating pattern of the geometry and other images where each of the repeating series members has two images.

Measure and compare lengths in centimeters to meters. Measure and compare the weight in kilograms to gram. Distinguish triangles, squares, circles, sphere, cylinder, and cones.

Understand statistical processes and use statistical knowledge to solve the problem. Use the data from the picture chart to find out the problem. When 1 image is defined, replace 1 unit.

Providing students with experiences or creating real-life situations that are relatable, enabling them to engage in hands-on exploration, experimentation, summarization, and reporting, in order to develop skills in mathematical reasoning, problem-solving, communication, and interpretation. This approach fosters the ability to apply acquired experiences, knowledge, ideas, skills, and processes to various learning contexts and to everyday life in a creative manner. It also cultivates a sense of value and a positive attitude toward mathematics, encouraging students to work systematically, carefully, and responsibly, with sound judgment and self-confidence.

Assessment and evaluation are conducted using a variety of methods appropriate to the content and skills being measured, reflecting real-world contexts.

Indicator code Total 10 Indicators

Formative Indicators 3 indicator

M 1.1 Gr1/1 , Gr1/2, Gr1/4

Terminal Indicators 7 indicator

M 1.1 Gr1/3 , Gr1/5

M 1.2 Gr1/1

M 2.1 Gr1/1 , Gr1/2

M 2.2 Gr1/1

M 3.1 Gr1/1

Course Description

Basic Mathematics Course

Code : M12101

Grade 2

Time : 200 hours/Year

Study, practice, calculate, and solve problems in the following subjects. Reading and writing Hindu Arabic numerals, Thai numerals and alphabets. Count increments by 5, by 10 and by 100 at a time. Count down by 2, by 10 and 100 by number. Number of odd and even pairs. Numbers in each digit and the use of 0. To seize the position of the main Numerical representation of numbers in distributed form Comparison of the number and use of the sign $=$, $\neq$, $>$, $<$ numbering order no more than five.

Addition, subtraction, multiplication, integer multiplication, up to two digits. Divide the divisor and the divisor into one digit. Add, subtract, multiply, divide, solve and solve problems.

Length measurement (centimeters), Weighing (kilograms), Measuring (liter), comparison of length, weight, volume and capacity (Same unit). Type and value of coins and banknotes. Comparison of Coins and Banknotes to tell the total amount (Baht and Satang). Telling time clock with minutes (5 minutes). Reading Calendar Month and evaluate Month. Solve positive and negative problems with the measurement of the length of the weighing scale. Problem, plus, minus, divide and measure.

Triangle, square, oval-shaped, rectangular, circular, cylindrical shape. Classification of two-dimensional geometry with three-dimensional geometry Triangulation Circular, elliptical, and elliptical shapes using a pattern.

Forms of numbers are incremented by 5 at a time, 10 at a time, and 100 at a time. The figure of the number decreases by 2 by 2 by 10 and by 100 by 2. A picture of a shape, size, or color that relate to one another.

To organize the experience or create a close-up situation, the students have to study the truth by practicing, experimenting, summarizing, reporting to improve their skills and processes. Calculation of Problem Solving. Communicating mathematical knowledge and applying knowledge, ideas, and process skills to learn things and use it in everyday life to create. Include good value and good attitude. Mathematics, able to work in a systematic, thoughtful, responsible, critical and self-confident manner.

Use a variety of measurement and evaluation methods based on actual content and skills to measure.

Indicator code Total 16 Indicators**Formative Indicators 8 indicator**

M 1.1 Gr2/1, Gr2/2 , Gr2/4, Gr2/5, Gr2/6, Gr2/7

M 2.1 Gr2/2, Gr2/4,

Terminal Indicators 8 indicator

M 1.1 Gr2/3, G2/8

M 2.1 Gr2/1, G2/3, G2/5, Gr2/6

M 2.2 Gr2/1

M 3.1 Gr2/1

Course Description

Basic Mathematics Course
Grade 3

Course Code: M13101
Time: 200 hours/Year

Students study, analyze, compare, and practice skills in reading, writing, numeracy, and problem-solving through the use of numbers to represent quantities obtained from counting. They learn to read and write Hindu-Arabic numerals, Thai numerals, and number words up to 100,000; understand place value; and express numbers in expanded form. They compare and order numbers, perform addition, subtraction, multiplication, and mixed operations, and solve word problems. Students also learn to use fractions (with numerators less than or equal to denominators) to represent quantities, including reading and writing fractions, comparing and ordering fractions, adding and subtracting fractions, and solving related problems.

Students explore number patterns with consistent increases or decreases, understand monetary concepts such as expressing, comparing, and converting money, writing amounts using decimal points, and recording income and expenses. They also solve word problems related to time, including telling time to the hour and minute, reading and writing time using dot (.) or colon (:), calculating and comparing time intervals, recording time-based activities, and solving time-related problems.

In measurement, students measure length using appropriate tools, estimate lengths in meters and centimeters, compare lengths, and solve related problems. They also measure weight, select appropriate scales, estimate weight in kilograms and hectograms, compare weights, and solve weight-related problems. For volume and capacity, students select appropriate measuring tools, estimate volume and capacity in liters, compare values, and solve related problems.

Students classify shapes based on the presence or absence of lines of symmetry, identify two-dimensional shapes with symmetry, and determine the number of lines of symmetry. They collect and classify data, read and write pictographs and one-way tables, and use these representations to find solutions to problems.

Throughout these learning experiences, students apply mathematical processes and problem-solving skills, choose appropriate strategies, and use reasoning to make logical decisions. They communicate ideas effectively using mathematical language and symbols, and they connect their knowledge and thinking to real-life situations. Hands-on exploration and the creative use of technology are emphasized to enhance learning and communication.

Students are encouraged to value mathematics and develop positive attitudes toward the subject. They learn to work systematically and carefully, act responsibly, exercise sound judgment, and build self-confidence. Assessment and evaluation are conducted through various methods that reflect the real-world context of the content and the skills being assessed, ensuring that learners meet the required academic standards.

Indicator code total 28 Indicators**Formative Indicators 15 indicator**

M 1.1 Gr3/1, Gr3/3, Gr3/5 , Gr3/6, Gr3/7, Gr3/8, Gr3/10

M 2.1 Gr3/3, Gr3/4, Gr3/7, Gr3/8 , Gr3/9 , Gr3/11, Gr3/12

Terminal Indicators 13 indicator

M 1.1 Gr3/2, Gr3/4, Gr3/9 , Gr3/11

M 1.2 Gr3/1,

M 2.1 Gr3/1, Gr3/2, Gr3/6, Gr3/10, Gr3/13

M 2.2 Gr3/1

M 3.1 Gr3/1, Gr3/2

Course Description

Basic Mathematics Course
Grade 4

Course Code: M14101
Time: 160 hours/Year

Study, practice, calculate, and solve problems in the following subjects.

Reading and writing Hindu Arabic numerals, Thai numbers and letters showing counts. The digits and values of the numerals in each digit of the count and the use of 0 to hold the position of the digit. Numerical representation of numbers in distributed form Comparisons and Sorting, Count, Meaning, Writing, and Reading. Comparison and sequencing of fractions with equal parts, meaning, writing, and one decimal place. Comparison and collocation of one decimal place.

Addition, subtraction, multiplication, multiplication, and multiplication of more than four digits. Multiply more than one digit with more than two digits. Divide the divisor by no more than three digits. Add, subtract, multiply, divide, and average the probability of the number of counts. Addition and subtraction of fractions with equal parts.

Relationship of unit length, weighing units, measuring unit, time unit. Finding the area of the rectangle. Timing is a clock with minutes. Time writing using point and read Timeline. Prediction Weight and volume or the capacity of the problem with measuring the length of the scale. Volume, capacity and writing time. Revenue receipt Reading and writing activity logs or events that indicate time. Reading schedules

Corner component Composition of names and symbols representing angles, angles, parallelograms, and parallels. Components of a circle, rectangle, square, rectangular, rectangular, and geometric shapes.

The figure of the number increases or decreases by the same amount. Geometric shapes and other shapes.

Data Collection and Identification Reading charts, pictures, bar charts and graphing charts, charts and bar charts.

To organize the experience or create a close-up situation for the students to study the truth by practicing, experimenting, summarizing and reporting. To develop the skills / processes in the calculation. Problem solving, reasoning, mathematical expressions and bring the experience of knowledge and ideas. Process skills are used to learn things and use them in everyday life, to create, to see, to value and to have a good attitude. Mathematics can work in a systematic, thoughtful, responsible, critical and self-confident manner.

There are various methods of measurement and evaluation. Based on the actual state of the content and the skills to measure.

Indicator code total 22 Indicators**Formative Indicators 12 indicator**

M 1.1 Gr4/1, Gr4/3, Gr4/5, Gr4/7, Gr4/8, Gr4/9, Gr4/10, Gr4/12, Gr4/13, Gr4/15

M 2.1 Gr4/2

M 2.2 Gr4/1

Terminal Indicators 10 indicator

M 1.1 Gr4/2 Gr4/4, Gr4/6, Gr4/11, Gr4/14, Gr4/16

M 2.1 Gr4/1 Gr4/3

M 3.1 Gr4/1

Course Description

Basic Mathematics Course

Course Code: M15101

Grade 5

Time: 160 hours/Year

Study, practice, calculate, and solve problems in the following subjects.

Meaning, reading and writing of fractional fraction, number of decimals and decimals does not exceed two places, fractions equal to the number of writers. Count in fractional fraction. Writing in mixed and mixed form, in fractional form, fractional fraction, low fraction, principal value, and the number of digits in each digit of the count and the decimal not to exceed two positions. Decimal writing in distributed form comparison and collocation of decimal not more than two locations. Comparison and sequencing of parts One person is a multiple of the other. Meaning, reading and writing percentages. Fragmentation of part fractions is a factor of 10 and 100 in decimal and percentage. Writing Percentage and Decimals Decomposition not more than two places in fractional form and percentage. Approximate total of ten Full and full of thousands

The relationship of the volume or capacity unit, the circumference of the rectangle and the triangle.

Finding the area of the rectangle and the triangle. Measure the size of the corners using the printer. Find the size of the angle Finding the volume or capacity of a right-angled triangle. Problem with respect to the area and the circumference of the rectangles and triangles

Circular cylinders, conical prisms, rectangular pyramids, and triangles of various types. Elements of the triangle, the type of angle. Angle Creation with Protractor. Create rectangles, triangles, and circles. Create parallel lines using tree trunks. Form of number.

Data Collection and Identification to write a bar graph with a reduced line length. Reading bar charts. Predictions about the occurrence of events. Organizing experiences or creating close-up situations allows learners to study, practice, experiment, summarize, and report on skills and processes. Calculation of problem solving, reasoning, mathematical interpretation, and knowledge-based thinking. Process skills are used to learn something. And use it in everyday life to create. Include good value and good attitude towards math. Can work in a systematic, responsible, critical and self-confident manner.

There are various methods of measurement and evaluation. Based on the actual state of the content and the skills to measure.

Indicator code total 19 Indicators

Formative Indicators 9 indicator

M 1.1 Gr5/1 ,Gr5/3, Gr5/4, Gr5/6, Gr5/7

M 2.1 Gr5/1, Gr5/2

M 2.2 Gr5/1, Gr5/2

Termina indicators 10 indicator

M 1.1, Gr5/2, Gr5/5, Gr5/8, Gr5/9

M 2.1 Gr5/3, Gr5/4

M 2.2 Gr5/3, Gr5/4

M 3.1 Gr5/1, Gr5/2

Course Description

Basic Mathematics Course
Grade 6

Course Code: M16101
Time: 160 hours/Year

Study, practice, calculate, and solve problems in the following subjects.

Meaning, reading and writing three decimal places. Principal values and values of digits in each digit of three decimal places. Decimal writing in distributed form Comparison and collocation of up to three decimal places. Comparison and Sorting Decomposition not more than three places in fractional form, and fractional fractionation is a factor of 10, 100, 1,000 in decimal.

Addition, Subtraction, Multiplication, and Division Fraction. Addition, subtraction, multiplication,

and division are mix number. Addition, subtraction, multiplication of fractions, and miscellaneous mix number. Addition, subtraction, multiplication, and division decimal. Addition, subtraction, multiplication, division of decimal Solve problems of counts. Decimals and Percentage.

Approximate value is tens of thousands. Full and Full Estimates are close to one decimal place and two positions.

Positive and multiplication properties Divisibility and multiplication

Direction, scale, map reading, rectangular area finding, circle length and circular area. Estimate the area of the rectangle. Solve the problem of the length, the circumference, and the area of the quadrilateral and the circle. Solve the problem of volume or rectangular capacity. Write Mapping

The components of the three-dimensional geometry are the properties of the diagonals of the

quadrilateral. Considering the invisible parallel lines of three-dimensional geometry. 3D geometry invention. Creating a rectangle.

Problem with model. Equation of linear equation with an unknown value. Equations of Equality of Addition, Subtraction, Multiplication, or Division. Solving problems with equations. Reading of line graphs and pie charts. Drawing bar charts and graphs. Predictions about the occurrence of events. Organizing experiences or creating close-up situations allows learners to study, practice, experiment, summarize, and report on skills and processes. Calculation of problem solving, reasoning, mathematical interpretation, and knowledge-based thinking. Process skills are used to learn something. And use it in everyday life to create. Include good value and good attitude towards math. Can work in a systematic, responsible, critical and self-confident manner.

There are various methods of measurement and evaluation. Based on the actual state of the content and the skills to measure.

Indicator code Total 21 Indicators**Formative Indicators 8 indicator**

M 1.1 Gr6/2, Gr6/3, Gr6/4, Gr6/5, Gr6/7, Gr6/9,

M 2.2 Gr6/1, Gr6/4

Terminal Ind, indicators 13 indicator

M 1.1 Gr6/1, Gr6/6, Gr6/8, Gr6/10, Gr6/11, Gr6/12

M 1.2 Gr6/1

M 2.1 Gr6/1, Gr6/2, Gr6/3

M 2.2 Gr6/2, Gr6/3

M 3.1 Gr6/1

Course structure

Learning Time Structure Mathematics

Grade 1: - Continuous assessment score 70 points

Time: 200 hours

- Final examination

score 30 points

Chapter	Content	Standard of Mathematics	Time (hours) 200	C.A.S Score 70	Final Examination 30
1	Cardinal number 1-10 and 0	M1.1: Gr1/1 M1.1: Gr1/2 M1.1: Gr1/3	18	6	2
2	Addition the vertically are not exceeding to 10.	M1.1:Gr1/4 M1.1:Gr1/5	15	6	3
3	Subtracting the vertically are not exceeding to 10.	M1.1:Gr1/4 M1.1:Gr1/5	16	6	3
4	Cardinal number 11-20.	M1.1: Gr1/1 M1.1: Gr1/2 M1.1: Gr1/3	12	6	2
5	Addition and subtraction number of the count not exceed 20.	M1.1:Gr1/4 M1.1:Gr1/5	19	6	3
6	The picture chart	M3.1:Gr1/1	7	2	1
7	The weight	M2.1:Gr1/2	13	3	1
Mathematics through STEM: The Joyful Learning Field Trip					
Total Semester: 1st				35	15

Chapter	Content	Standard of Mathematics	Time (hours) 200	C.A.S Score 70	Final Examination 30
8	The position and rank	-	8	0	1
9	Geometry	M1.2: Gr1/1 M2.2: Gr1/1	15	4	2
10	Cardinal number 21-100	M1.1: Gr1/1 M1.1: Gr1/2 M1.1: Gr1/3	17	6	2
11	Length measurement	M2.1: Gr1/1	14	5	1
12	Additions are not exceeding to 100.	M1.1: Gr1/4	12	7	3
13	Subtraction two numbers are not exceeding to 10.	M1.1: Gr1/4	16	7	3
14	Word problem of Addition and subtraction.	M1.1: Gr1/4 M1.1: Gr1/5	18	6	3
Total Semester: 2nd				35	15
Total score all year				70	30

Learning Time Structure Mathematics

Grade 2: - Continuous assessment score 70 points

Time: 200 hours

- Final examination

30 points

Chapter	Content	Standard of Mathematics	Time (hours) 200	C.A.S Score 70	Final Examination 30
1	Numbers up to 1,000	M1.1: Gr2/1, Gr2/2, Gr2/3	20	8	3
2	Addition and Subtraction within 100	M1.1: Gr2/4, Gr2/8	24	8	4
3	Measurement	M2.1: Gr2/1 ,Gr2/2,Gr2/3	15	5	2
4	weight measurement	M2.1: Gr2/4, Gr2/5	16	5	2
5	Multiplication	M1.1: Gr2/5, Gr2/8	25	9	4
Total Semester: 1 st				35	15

Chapter	Content	Standard of Mathematics	Time (hours) 200	C.A.S Score 70	Final Examination 30
6	Division	M1.1: Gr2/6, Gr2/8	25	9	3
7	Time	M2.1: Gr2/1	20	7	3
8	Volume measurement	M2.1: Gr2/6	15	4	2
9	Geometric figure	M2.2: Gr2/1	8	4	2
10	Addition, subtraction, multiplication, division	M1.1: Gr2/7, Gr2/8	24	7	3
11	Geometry	M3.1: Gr2/1	8	4	2
Total Semester: 2 nd				35	15
Total score all year				70	30

Learning Time Structure Mathematics

Grade 3: - Continuous assessment score 70 points

Time: 200 hours

- Final examination

30 points

Chapter	Content	Standard of Mathematics	Time (hours) 200	Scores (100)	
				C.A.S 70	Final 30
1	cardinal numbers not exceeding 100,000	M 1.1 P.3/1 M 1.1 P.3/2	14	5	2
2	Fun with addition and subtraction cardinal numbers not exceeding 100,000	M 1.1 P.3/5	20	6	3
3	Time is interesting	M 2.1 P.3/2	15	4	2
4	Geometric shapes	M 2.2 P.3/1	10	3	1
5	Picture charts and one way table	M 3.1 P.3/1 M 3.1 P.3/2	12	3	1
6	Fraction	M 1.1 P.3/3 M 1.1 P. 3/4 M 1.1 P.3/11	13	7	3
7	Practice about multiplication	M 1.1 P. 3/6	16	7	3
Total Semester: 1 st				35	15

Chapter	Content	Standard of Mathematics	Time (hours) 100	Scores (100)	
				C.A.S 70	Final 30
8	Practice about division	M 1.1 P.3/7	17	7	3
9	Let's measure of length	M 2.1 P.3/3 M 2.1 P.3/4 M 2.1 P.3/5 M 2.1 P.3/6	18	6	2
10	Let's measure of weight	M 2.1 P.3/7, M 2.1 P.3/8 M 2.1 P.3/9 M 2.1 P. 3/11	16	6	2
11	Measuring Volume	M 2.1 P.3/11, P.3/12 M 2.1 P. 3/13	18	5	2
12	Learning about money	M 2.1 P.3/1	15	4	2
13	Mathematical skill and process	M 1.1 P. 3/8 M 1.1 P. 3/9	16	6	3
Total Semester: 2nd				35	15
Total score all year				70	30

Learning Time Structure Mathematics

Grade 4: Continuous assessment score 70 points

Time: 160 hours

Final examination

30 points

Chapter	Content	Standard of Mathematics	Time (hours) 160	C.A.S Score 70	Final Examination 30
1	Numbers greater than 100,000	M1.1: Gr4/1, Gr4/2	12	6	2
2	Addition and Subtraction greater than 100,000	M1.1: Gr4/7, Gr4/8	13	8	4
3	Multiplied and division	M1.1: Gr4/7, Gr4/9	24	8	4
4	Addition, subtract, multiplied and division cardinal numbers.	M1.1: Gr4/10, Gr4/11, Gr4/12	19	7	4
5	time	M2.1: Gr4/1	12	6	1
Total Semester: 1st				35	15

Chapter	Content	Standard of Mathematics	Time (hours) 160	C.A.S Score 70	Final Examination 30
6	Fraction	M1.1: Gr4/3, Gr4/4, Gr4/13 ,Gr4/14	23	8	4
7	Decimals	M1.1: Gr4/5, Gr4/6, Gr4/15, Gr4/16	20	8	4
8	Angles	M2.1: Gr4/2 M2.1: Gr4/1	11	8	4
9	rectangular	M2.1: Gr4/3 M2.2: Gr4/2	19	8	2
10	Presentation of Information	M3.1: Gr4/1	7	3	1
Total Semester: 2nd				35	15
Total score all year				70	30

Learning Time Structure Mathematics

Grade 5 : Continuous assessment score 70 points

Time: 160 hours

Final examination

30 points

No.	Name of Learning Unit	Learning standards / indicators	Time (hours) 160	Points During Study 70	Year End Points 30
1	fraction	M. 1.1 P. 5/3 M. 1.1 P. 5/4 M. 1.1 P. 5/5	34	15	6
2	decimal places	M.1.1 P. 5/1 M.1.1 P. 5/6 M.1.1 P. 5/7 M.1.1 P. 5/8 M.2.1 P. 5/1 M.2.1 P. 5/2	34	15	6
3	Presentation of information	M.3.1 P. 5/1 M.3.1 P. 5/2	12	5	3
Total Semester: 1st				35	15

No.	Name of Learning Unit	Learning standards / indicators	Time (hours)	Points During Study	Year End Points
4	Prohibited Truth	M. 1.1 P. 5/2	9	5	3
5	percent	M.1.1 P. 5/9	17	5	3
6	Parallel lines	M.2.2 P. 5/1	13	5	3
7	Quadrilateral	M.2.1 P. 5/4 M.2.2 P. 5/2 M.2.2 P. 5/3	24	10	3
8	The volume and capacity of the rectangle	M.2.1 P. 5/3 M.2.2 P. 5/4	17	10	3
Total Semester: 2nd				35	15
Total score all year				70	30

Learning Time Structure Mathematics

Grade 6: Continuous assessment score 70 points

Time: 160 hours

Final examination

30 points

Chapter	Content	Standard of Mathematics	Time (hours) 160	C.A.S Score 70	Final Examination 30
1	G.C.D. (Greatest common divisor) And L.C.M. (Least common multiple)	M1.1: Gr6/4 M1.1: Gr6/5 M1.1: Gr6/6	19	9	3
2	Fractions	M1.1: Gr6/1 M1.1: Gr6/7 M1.1: Gr6/8	17	8	4
3	Decimals	M1.1: Gr6/9 M1.1: Gr6/10	15	7	3
4	Percentage	M1.1: Gr6/2 M1.1: Gr6/3 M1.1: Gr6/11 M1.1: Gr6/12	20	8	3
5	Pattern	M1.2: Gr6/1	9	3	2
Total Semester: 1 st				35	15

Chapter	Content	Standard of Mathematics	Time (hours) 160	C.A.S Score 70	Final Examination 30
6	Triangle	M2.2: Gr6/1 M2.2: Gr6/2	20	7	3
7	Polygon	M2.1: Gr6/2	17	6	3
8	Circle	M2.1: Gr6/3	20	7	3
9	Tree-Dimensional Geometric Shape	M2.1: Gr6/1 M2.2: Gr6/3 M2.2: Gr6/4	13	10	4
10	Data Presentation	M3.1: Gr6/1	10	5	2
Total Semester: 2 nd				35	15
Total score all year				70	30

Weigh points according to
learning outcomes

Table analysis indicators standard of Mathematics with the chapter

Course Code: M11101

Grade 1

[illegible]

[illegible]

No.	Indicators	Chapter														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	total
	When 1 image is defined, replace 1 unit.															
Total Score		6	6	6	6	6	2	3	-	4	6	5	7	7	6	70

Table analysis indicators standard of Mathematics with the unit plan
(end the academic year)

Course Code: M11101

Grade 1

Indicators	Unit Plans														Total
	First semester							Second semester							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
M 1.1 GR. 1/1	1			1						1					3
M 1.1 Gr. 1/2	0.5			0.5						0.5					1.5
M 1.1 Gr. 1/3	0.5			0.5						0.5					1.5
M 1.1 Gr. 1/4		1	1		2							3	3		10
M 1.1 Gr. 1/5		2	2		1									3	8
M 1.2 Gr. 1/1									1						1
M 2.1 Gr. 1/1											1				1
M 2.1 Gr. 1/2							1								1
M 2.2 Gr. 1/1									1						1
M 3.1 Gr. 1/1						1									1
No indicators								1							1
Total	2	3	3	2	3	1	1	1	2	2	1	3	3	3	30
	15							15							

Table analysis indicators standard of Mathematics with the chapter

Course Code: Sc12101

Grade 2

No.	Indicators	Chapters											
		1	2	3	4	5	6	7	8	9	10	11	total
1	M1.1 Gr2/1 Write and read Hindu-Arabic and Thai numerals and written forms showing quantity of objects or cardinal numbers not exceeding 1,000, and 0.	3											3
2	M1.1 Gr2/2 Compare and arrange sequence of cardinal numbers not exceeding 1,000, and 0.	3											3
3	M1.1 Gr2/3 Sort numbers up to 1,000 and 0 from 3 to 5 numbers from various situations.	2											2
4	M1.1 Gr2/4 Find the value of the unknown in the addition and subtraction statements of numbers up to 1000 and 0.		4										4
5.	M1.1 Gr2/5 Find the value of the unknown in the multiplication symbol sentence of a number of 1 digit by a number of up to 2 digits.					5							5
6.	M1.1 Gr2/6 Find the value of the unknown in the division symbol sentence with no more than 2-digit divisor and 1-digit divisor where the quotient						6						6

No.	Indicators	Chapters											
		1	2	3	4	5	6	7	8	9	10	11	total
7.	M1.1 Gr2/7 Find the results of adding, subtracting, multiplying, and dividing a number of numbers up to 1,000 and 0.										4		4
8.	M1.1 Gr2/8 Shows how to find the answer to the 2-step problem of numbers up to 1000 and 0.		4			4	3				3		14
9.	M2.1 Gr2/1 Tell length in metres and centimetres, and compare length by using the same unit.							7					7
10.	M2.1 Gr2/2 Tell weight in kilogrammes and grammes, and compare weight by using the same unit.			3									3
11.	M2.1 Gr2/3 Tell volume and capacity in litres, and compare volume and capacity.			2									2
12.	M2.1 Gr2/4 Tell total amount of money from coins and bank notes.				3								3
13.	M2.1 Gr2/5 Tell the time on a clock dial (period of 5 minutes).				2								2
14.	M2.1 Gr2/6 Tell the days, months and year from a calendar.								4				4
15.	M2.2 Gr2/1 Solve problems involving measurement of length, weight, volume and money.									4			4

No.	Indicators	Chapters											
		1	2	3	4	5	6	7	8	9	10	11	total
16.	M3.1 Gr2/1 Identify two-dimensional geometric figures whether in the form of triangles, quadrilaterals, circles or ellipses											4	4
Total score		8	8	5	5	9	9	7	4	4	7	4	70

Table analysis indicators standard of Mathematics with the unit plan
(end the academic year)

Course Code: M12101

Grade 2

Indicators	Unit Plans											Total
	First semester					Second semester						
	1	2	3	4	5	6	7	8	9	10	11	
M 1.1 Gr. 2/1	1											1
M 1.1 Gr. 2/2	1											1
M 1.1 Gr. 2/3	1											1
M 1.1 Gr. 2/4		2										2
M 1.1 Gr. 2/5					2							2
M 1.1 Gr. 2/6						2						2
M 1.1 Gr. 2/7										2		2
M 1.1 Gr. 2/8		2			2	1				1		6
M 2.1 Gr. 2/1							3					3
M 2.1 Gr. 2/2			1									1
M 2.1 Gr. 2/3			1									1
M 2.1 Gr. 2/4				1								1
M 2.1 Gr. 2/5				1								1
M 2.1 Gr. 2/6								2				2
M 2.2 Gr. 2/1									2			2
M 3.1 Gr. 2/1											2	2
Total	3	4	2	2	4	3	3	2	2	3	2	30
	15					15						

[illegible]

Indicators	Chapters													
	1	2	3	4	5	6	7	8	9	10	11	12	13	total
equations involving a one-digit number and a number up to four digits, or two-digit by two-digit numbers.														
6. solve for the unknown in division equations with dividends up to four digits and one-digit divisors.							7							7
7. M1.1 Gr3/7 Find the value of the unknown in the division symbol sentence where the divisor is not more than 4 digits and the divisor is 1 digit.								7						7
8. M1.1Gr3/8 finding answer of addition, subtraction, multiplication and division of cardinal numbers not exceeding 100,000, and 0													3	3
9. M1.1Gr3/9 Write the solution to solve word problems in 2 steps of cardinal numbers not exceeding 100,000, and 0.													3	3
10. M1.1Gr 3/10 Find the answers of the addition and						2								2

Indicators	Chapters													
	1	2	3	4	5	6	7	8	9	10	11	12	13	total
subtraction of fractions as equivalent (equal) if they are the same size, or the same point on a number line.														
11. M1.1 Gr3/11 Write the solution to solve word problems of the addition and subtraction of fractions as equivalent (equal) if they are the same size, or the same point on a number line.						3								3
12. M1.2Gr3/1 Tell the numbers and relations in patterns of numbers that increases by 3s, 4s, 25s and 50s, and decreases by 3s, 4s, 5s, 25s and 50s and in repeated patterns.	1													1
13. M2.1Gr3/1 Shows how to find answers to money-related problems.												4		4
14. M2.1Gr3/2 Write the solution to solve word problems about the time			4											4
15. M2.1Gr3/3 Choose the right									1					1

Indicators	Chapters													
	1	2	3	4	5	6	7	8	9	10	11	12	13	total
length meter, measure and tell. length of things in centimeters and millimeters meters and centimeters														
16. M2.1Gr3/4 Estimate length in meters and centimeters.									1					1
17. M2.1Gr3/5 Compare the length between centimeters and millimeters. meter to centimeter kilometers to meters from various situations									2					2
18. M2.1Gr3/6 Shows how to find answers to length problems. with units of centimeters and millimeters Meters and Centimeters Kilometers and Meters									3					3
19. M2.1Gr3/7 Choose the right balance Measure and tell the weight in kilograms and marks, kilograms and marks.										1				1
20. M2.1Gr3/8 Estimated weight in										1				1

[illegible]

Indicators	Chapters													
	1	2	3	4	5	6	7	8	9	10	11	12	13	total
presence or absence of Symmetrical axis														
27. M3.1Gr 3/1 Draw and write a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step					2									2
28. M3.1 Gr3/2 Write the one way table from the number data and using one way table data to find the answer					1									1
รวมคะแนนทั้งหมด	5	6	4	3	3	7	7	7	7	6	5	4	6	70

Table analysis indicators standard of Mathematics with the unit plan
(end the academic year)

Course Code: M13101

Grade 3

Indicators	Unit Plans													Total
	First semester							second semester						
	1	2	3	4	5	6	7	8	9	10	11	12	13	
M 1.1 Gr. 3/1	1													1
M 1.1 Gr. 3/2	0.5													0.5
M 1.1 Gr. 3/3						0.5								0.5
M 1.1 Gr. 3/4						0.5								0.5
M 1.1 Gr. 3/5		1												1
M 1.1 Gr. 3/6							1							1
M 1.1 Gr. 3/7								1						1
M 1.1 Gr. 3/8		1					1	1					1.5	4.5
M 1.1 Gr. 3/9		1					1	1					1.5	4.5
M 1.1 Gr. 3/10						1								1
M 1.1 Gr. 3/11						1								1
M 1.2 Gr. 3/1	0.5													0.5
M 2.1 Gr. 3/1												2		2
M 2.1 Gr. 3/2			2											2
M 2.1 Gr. 3/3									1					1
M 2.1 Gr. 3/4														-
M 2.1 Gr. 3/5									1					1
M 2.1 Gr. 3/6									1					1
M 2.1 Gr. 3/7										0.5				0.5
M 2.1 Gr. 3/8														-
M 2.1 Gr. 3/9										0.5				0.5
M 2.1 Gr. 3/10										1				1
M 2.1 Gr. 3/11											1			1
M 2.1 Gr. 3/12														-
M 2.1 Gr. 3/13											1			1
M 2.2 Gr. 3/1				1										1
M 3.1 Gr. 3/1					0.5									0.5
M 3.1 Gr. 3/2					0.5									0.5
Total	2	3	2	1	1	3	3	3	3	2	2	2	3	30
	15							15						

Table analysis indicators standard of Mathematics with the chapter

Course Code: M14101

Grade 4

No.	Indicators	Chapter										total
		1	2	3	4	5	6	7	8	9	10	
1.	M1.1 Gr4/1 Write and read Hindu-Arabic, Thai numerals and the letters are showing cardinal numbers greater than 100,000.	3										3
2.	M1.1Gr4/2 Compare and arrange sequence of cardinal numbers greater than 100,000 from various situations.	3										3
3.	M1.1 Gr4/3 Describe, read and write fractions, mixed numbers, showing quantity and showing things according fractions, mixed numbers assigned.						1					1
4.	M1.1 Gr4/4 Compare, arrange fractions and mixed numbers, one denominator is multiple of another.						2					2
5.	M1.1 Gr4/5 read and writes decimal less than 3 positions Showing quantity of things and showing things according decimal to assign.							2				2
6.	M1.1 Gr4/6 Compare and arrange decimal less than 3 positions from various situations.							1				1
7.	M1.1 Gr4/7 estimated results of addition subtract, multiplied, division from various situations reasonably.		4	4								8

No.	Indicators	Chapter										
		1	2	3	4	5	6	7	8	9	10	total
8.	M1.1 Gr4/8 Find the value of the unknown in mathematical statement showing addition and mathematical statement showing subtract of cardinal numbers more than 100,000 and 0		4									4
9.	M1.1 Gr4/9 Find the value of the unknown in the mathematical statement showing multiplied multiples digit 6 Number with product not exceeding 6 value and mathematical statement showing dividend not exceeding 6			4								4
10.	M1.1 Gr4/10 find result addition, subtract, multiplied, mix addition of cardinal numbers and 0				2							2
11.	M1.1 Gr4/11 showing how to find answers of word problems 2 steps of cardinal numbers greater than 100,000 and 0				3							3
12.	M1.1 Gr4/12 creating word problems 2 steps of cardinal numbers and 0 with find answers				2							2
13.	M1.1 Gr4/13 Find sum, quotient of fraction and mixed numbers that a denominator is multiple of each another.						2					2
14.	M1.1 Gr4/14 Showing how to find answers of word problems addition subtracts						3					3

No.	Indicators	Chapter										
		1	2	3	4	5	6	7	8	9	10	total
	fraction and mixed numbers that a denominator is multiple of each another.											
15.	M1.1 Gr4/15 Find sum, subtract of fraction not exceeding 3 positions.							2				2
16.	M1.1 Gr4/16 Showing how to find Answers of word problems addition, subtract 2 steps of word problems not exceeding 3 positions.							3				3
17.	M2.1 Gr4/2 Showing how to fine the answers of word problems about time.					6						6
18.	M2.1 Gr4/3 Measuring and making angles by using diagraph.											
19.	M2.2 Gr4/1 Showing how to find the answers of word problems about perimeter and area of rectangular.									5		5
20.	M2.2 Gr4/1 Classify type of angles. Tell the name of angle, component of angle and write symbol showing angle.								3			3
21.	M2.2 Gr4/2 Making rectangular when assigned length of side.									3		3
22.	M3.1 Gr4/1 Using information from bar graph, two-way table to find the answers of word problems.										3	3
รวมคะแนนทั้งหมด		6	8	8	7	6	8	8	8	8	3	70

Table analysis indicators standard of Mathematics with the unit plan
(end the academic year)

Course Code: M14101

Grade 4

Indicators	Unit Plans										Total
	First semester					second semester					
	1	2	3	4	5	6	7	8	9	10	
M 1.1 Gr. 4/1	1										1
M 1.1 Gr. 4/2	1										1
M 1.1 Gr. 4/3						1					1
M 1.1 Gr. 4/4						1					1
M 1.1 Gr. 4/5							1				1
M 1.1 Gr. 4/6							1				1
M 1.1 Gr. 4/7		2	2								4
M 1.1 Gr. 4/8		2									2
M 1.1 Gr. 4/9			2								2
M 1.1 Gr. 4/10				2							2
M 1.1 Gr. 4/11				1							1
M 1.1 Gr. 4/12				1							1
M 1.1 Gr. 4/13						1					1
M 1.1 Gr. 4/14						1					1
M 1.1 Gr. 4/15							1				1
M 1.1 Gr. 4/16							1				1
M 2.1 Gr. 4/1					1						1
M 2.1 Gr. 4/2								2			2
M 2.1 Gr. 4/3									1		1
M 2.2 Gr. 4/1								2			2
M 2.2 Gr. 4/2									1		1
M 3.1 Gr. 4/1										1	1
Total	2	4	4	4	1	4	4	4	2	1	30
	15					15					

Table analysis indicators standard of Mathematics with the chapter

Course Code: M15101

Grade 5 Semester 1

No.	Indicators	Chapter								
		1	2	3	4	5	6	7	8	total
1	M 1.1 Gr5/1 Write a fractional whose denominator is factors of 10 or 100 or 1,000 in decimal.		2							2
2	M 1.1 Gr5/2 Show me how to find the answer to the problem by using trilogy.				5					5
3	M 1.1 Gr5/3 Find sums of the fractions and mixed numbers.	5								5
4	M 1.1 Gr5/4 Find the product of the fractions and mixed numbers.	5								5
5	M 1.1 Gr5/5 Two steps to find the answer to the problem of addition, subtraction, multiplication, and division of fractions.	5								5
6	M 1.1 Gr5/6 Find the products of the decimal number whose product is not more than 3 decimal places.		2							2
7	M 1.1 Gr5/7 Find the quotient in which the numerator is a number or decimal not more than 3 positions and the divisor is a number. The quotient is not more than 3 decimal places.		2							2
8	M 1.1 Gr5/8 Two steps on how to find solutions to problems of addition, subtraction, multiplication and division.		3							3
9	M 1.1 Gr5/9 Show the methods in finding the answer of the problem in percentages					5				5

No.	Indicators	Chapter								
		1	2	3	4	5	6	7	8	total
10	M 2.1 Gr5/1 Show how to find an answer to the problem of changing length and to decimal form.		3							3
11	M 2.1 Gr5/2 Show how to find an answer to a problem by changing weight units into decimal form.		3							3
12	M 2.1 Gr5/3 Types and properties of quadrilaterals.								5	5
13	M 2.1 Gr5/4 Diagonals of Quadrilaterals.							4		4
14	M 2.2 Gr5/1 Constructing Quadrilaterals.						5			5
15	M 2.2 Gr5/2 Types and properties of Quadrilaterals.							3		3
16	M 2.2 Gr5/3 Create different types of rectangles when determining the length of the side and the size of the corner or when determining the length of the diagonal.							3		3
17	M 2.2 Gr5/4 Tell the characteristics of prism.								5	5
18	M 3.1 Gr5/1 Use the information from the graph to find the answer to the problem.			2						2
19	M 3.1 Gr5/2 Write a bar chart from a given data.			3						3
รวมคะแนนทั้งหมด		15	15	5	5	5	5	10	10	70

Table analysis indicators standard of Mathematics with the unit plan
(end the academic year)

Course Code: M15101

Grade 5

Indicators	Unit Plans								Total
	First semester			Second semester					
	1	2	3	4	5	6	7	8	
M 1.1 Gr. 5/1		1							1
M 1.1 Gr. 5/2				3					3
M 1.1 Gr. 5/3	2								2
M 1.1 Gr. 5/4	2								2
M 1.1 Gr. 5/5	2								2
M 1.1 Gr. 5/6		1							1
M 1.1 Gr. 5/7		1							1
M 1.1 Gr. 5/8		1							1
M 1.1 Gr. 5/9					3				3
M 2.1 Gr. 5/1		1							1
M 2.1 Gr. 5/2		1							1
M 2.1 Gr. 5/3								2	2
M 2.1 Gr. 5/4							1		1
M 2.2 Gr. 5/1						3			3
M 2.2 Gr. 5/2							1		1
M 2.2 Gr. 5/3							1		1
M 2.2 Gr. 5/4								1	1
M 3.1 Gr. 5/1			3						3
M 3.1 Gr. 5/2									-
Total	6	6	3	3	3	3	3	3	30
	15			15					

[illegible]

No.	Indicators	Chapter										
		1	2	3	4	5	6	7	8	9	10	total
9.	M1.1 Gr6/9 Explain and specify square roots and cube roots of real numbers.			3								3
10.	M1.1 Gr6/10 Show relationships of various numbers in the real number system.			4								4
11.	M1.1 Gr6/11 Have concepts of absolute values of real numbers.				3							3
12.	M1.1 Gr6/12 Have concepts of real numbers expressed in exponential notation with rational indices, and real numbers expressed in radicals.				3							3
13.	M1.2 Gr6/1 Add, subtract and mix addition, subtraction, multiplication and division of fractions, mixed numbers and decimals, as well as be aware of validity of the answers.					3						3
14	M 2.1 Gr6/1 Demonstrate methods for solving word problems involving the volume of three-dimensional shapes composed of rectangular prisms.									4		4
15	M 2.1 Gr6/2 Demonstrate methods for solving word problems involving the perimeter and area of polygons							6				6
16	M 2.1 Gr6/3 Demonstrate methods for solving word problems involving the circumference and area of circles.								7			7
17	M 2.2 Gr6/1 Classify triangles based on their properties.						3					3

No.	Indicators	Chapter										
		1	2	3	4	5	6	7	8	9	10	total
18	M 2.2 Gr6/2 Construct triangles given the lengths of sides and measures of angles.						4					4
19	M 2.2 Gr6/3 Describe characteristics of various three-dimensional geometric shapes.									3		3
20	M 2.2 Gr6/4 Identify three-dimensional shapes from nets and identify nets corresponding to three-dimensional shapes.									3		3
21	M 1.2 Gr6/1 Interpret data from pie charts to solve word problems.										5	5
รวมคะแนนทั้งหมด		9	8	7	8	3	7	6	7	10	5	70

Table analysis indicators standard of Mathematics with the unit plan
(end the academic year)

Course Code: M16101

Grade 6

Indicators	Unit Plans										Total
	First semester					Second Semester					
	1	2	3	4	5	6	7	8	9	10	
M 1.1 Gr. 6/1		1									1
M 1.1 Gr. 6/2				0.5							0.5
M 1.1 Gr. 6/3				0.5							0.5
M 1.1 Gr. 6/4	1										1
M 1.1 Gr. 6/5	1										1
M 1.1 Gr. 6/6	1										1
M 1.1 Gr. 6/7		1									1
M 1.1 Gr. 6/8		2									2
M 1.1 Gr. 6/9			1								1
M 1.1 Gr. 6/10			2								2
M 1.1 Gr. 6/11				1							1
M 1.1 Gr. 6/12				1							1
M 1.2 Gr. 6/1					2						2
M 2.1 Gr. 6/1									1		1
M 2.1 Gr. 6/2							3				3
M 2.1 Gr. 6/3								3			3
M 2.2 Gr. 6/1						1.5					1.5
M 2.2 Gr. 6/2						1.5					1.5
M 2.2 Gr. 6/3									1		1
M 2.2 Gr. 6/4									2		2
M 3.1 Gr. 6/1										2	2
Total	3	4	3	3	2	3	3	3	4	2	30
	15					15					

Grade 1 Unit Design Framework

Chapter 1

Mathematics (M11101)

Content: Cardinal number 1-10 and 0

Time: 18 hours

Standard 1: Number and Algebra

Standard M1.1: Understand the variety of display numbers systems Operation of the number the result of the operation Treasures of action and to apply.

Grade level indicators

M 1.1 Gr1/1 Write and read Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers not exceeding 100, and 0.

M 1.1 Gr1/2 Compare of cardinal numbers not exceeding 100, and 0. Using the = $\neq$ > < .

M 1.1 Gr1/3 Arrange Number sequence not exceeding 100 and o from 3 to 5 number.

Learning Objective

Students will be taught to:

1. Write and read Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers not exceeding 100, and 0.

2. Compare of cardinal numbers not exceeding 100, and 0. Using the = $\neq$ > < .

3. Arrange Number sequence not exceeding 100 and o from 3 to 5 number.

Learning Outcomes

Students will be able to:

1. The number of things that represent things by a certain amount.

2. Write and read Hindu-Arabic and Thai numerals not exceeding 100, and 0.

3. Compare of cardinal numbers not exceeding 100, and 0. Using the = $\neq$ > < .

4. Arrange Number sequence not exceeding 100 and o from 3 to 5 number.

Learning Areas

- Count numbers 1 count each and 10 count each
- Write and read Hindu-Arabic and Thai numerals showing quantity quantity the number of cardinal.
- Showing number sequence not exceeding 20 Display Count not exceeding 20 The relationship of a number of small parts (part – whole relationship)
- Compare of cardinal numbers not exceeding 100, and 0. Using the = $\neq$ > <
- Arrange Number sequence

Teaching and Learning Activities

Students will be able to:

1. Students view the picture and tell the number of things that represent things by a certain amount. Write and read Hindu-Arabic and Thai numerals showing the quantity of objects or cardinal numbers not exceeding 100, and 0.
2. Students compare of cardinal numbers not exceeding 100, and 0. Using = $\neq$ > <.
3. Students do a worksheet about arranging Number sequence not exceeding 100 and 0 from 3 to 5 number.
4. Students do about test unit number sequence 1 to 10 and 0.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. 1. Worksheet on Stating Quantities of Objects	- Able to identify and state the number of objects according to the given quantity. - Able to read and write Hindu-Arabic and Thai numerals to represent counting numbers not exceeding 100 and 0.	- Observing pictures and stating the quantity of objects shown. - Practicing reading and writing Hindu-Arabic and Thai numerals to represent numbers not exceeding 100 and 0.
2. Worksheet on Comparing Counting Numbers Not Exceeding 100 and 0 Using Symbols (= $\neq$ > <)	- Able to compare counting numbers not exceeding 100 and 0 using the symbols = $\neq$ > <.	- Practicing comparison of numbers using = $\neq$ > <. - Completing a worksheet on ordering 3 to 5 counting numbers not exceeding 100 and 0.

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
3. Worksheet on Ordering Counting Numbers Not Exceeding 100 and 0 (from 3 to 5 numbers)	- Able to correctly order 3 to 5 counting numbers not exceeding 100 and 0.	- Completing a unit test on the topic: "Counting Numbers from 1 to 10 and 0."

Assessment Includes:

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or above.
3. Desirable Characteristics: Assessment result must be at Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Stating Quantities of Objects Students are able to can identify and state the quantity of objects as specified, and read/write Hindu-Arabic and Thai numerals from 1 to 10 and 0.	Student can state the quantities and read/write Hindu-Arabic and Thai numerals from 1 to 10 and 0 with 80% accuracy or higher.	Student can state the quantities and read/write Hindu-Arabic and Thai numerals from 1 to 10 and 0 with 70%–79% accuracy.	Student can state the quantities and read/write Hindu-Arabic and Thai numerals from 1 to 10 and 0 with 60%–69% accuracy.	Student can state the quantities and read/write Hindu-Arabic and Thai numerals from 1 to 10 and 0 with less than 60% accuracy.
2. Comparing Numbers Students compare counting numbers from 1 to 10 and 0 using symbols = $\neq$ > <.	Student can compare numbers from 1 to 10 and 0 using = $\neq$ > < with 80% accuracy or higher.	Student can compare numbers from 1 to 10 and 0 using = $\neq$ > < with 70%–79% accuracy.	Student can compare numbers from 1 to 10 and 0 using = $\neq$ > < with 60%–69% accuracy.	Student can compare numbers from 1 to 10 and 0 using = $\neq$ > < with less than 60% accuracy.

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
3. Ordering Numbers Students order counting numbers from 1 to 10 and 0 (from 3 to 5 numbers).	Student can correctly order 3 to 5 numbers from 1 to 10 and 0 with 80% accuracy or higher.	Student can correctly order 3 to 5 numbers from 1 to 10 and 0 with 70%–79% accuracy.	Student can correctly order 3 to 5 numbers from 1 to 10 and 0 with 60%–69% accuracy.	Student can correctly order 3 to 5 numbers from 1 to 10 and 0 with less than 60% accuracy.

Chapter 2

Mathematics (M11101)

Content: Addition of the verticals does not exceed to 10

Time: 15 hours

Standard 1: Number and Algebra

Standard M1.1: Understand the variety of display numbers systems, the operation of the numbers, the result of the operation, the treasures of action and to apply.

Grade level indicators

M1.1 Gr1/4 Look for the value of the unknown variable in the sentence. The addition indicator and the symbol of the subtraction number of the count should not exceed 100 and 0.

M1.1 Gr1/5 Shows you how to find the answers to the problem of addition and find the answers to the problem of subtraction of the count should not exceed 100 and 0.

Learning Objective

Students will be taught to :

1. Look for the value of the unknown variable in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.
2. Show you how to find the answers to the problem of addition and find the answers to the problem of subtraction of the count should not exceed 100 and 0.

Learning Outcomes

Students will be able to:

1. Look for the value of the unknown value in the sentence.
2. The addition indicator and the symbol of the subtraction number of the count should not exceed 100 and 0.
3. Show you how to find the answers to the problem of addition
4. find the answers to the problem of subtraction of the count not exceed 100 and 0.

Learning Areas

- The meaning of the addition and subtraction, the result of the addition and subtraction and the relation of addition and subtraction.
- Solving problems of addition and subtraction. And create solutions together to come up with an answer.

Teaching and Learning Activities

1. Students should practice looking for the unknown value in the sentence. The addition indicator and the symbol of the subtraction number of the count should not exceed 100 and 0.
2. Students should practice showing how to find the answers to the problem of addition and find the answers to the problem of subtraction of the count not exceeding 100 and 0.
3. Students do the test unit. Addition of the two numbers are not exceeding to 10.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Finding the Value of Unknowns in Addition and Subtraction Equations (with numbers not exceeding 100 and 0)	– Able to find the value of unknowns in symbolic addition and subtraction equations involving numbers not exceeding 100 and 0.	– Practice finding the value of unknowns in addition and subtraction equations with numbers not exceeding 100 and 0.
2. Worksheet on Showing the Solution Process for Addition and Subtraction Word Problems (within 100 and 0)	– Able to show the process of solving addition and subtraction word problems involving numbers not exceeding 100 and 0.	– Practice showing the steps in solving addition and subtraction word problems involving numbers not exceeding 100 and 0.

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Finding the Value of Unknowns in Addition Equations with a	Student can find the value of unknowns in addition equations with	Student can solve such equations with 70%–79% accuracy.	Student can solve such equations with 60%–69% accuracy.	Student can solve such equations with less than 60% accuracy.

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
Sum Not Exceeding 10	sums not exceeding 10 with 80% accuracy or higher.			
2. Showing the Process of Solving Addition Word Problems (Sum Not Exceeding 10)	Student can clearly show the process of solving word problems with sums not exceeding 10 with 80% accuracy or higher.	Student can show the process with 70%–79% accuracy.	Student can show the process with 60%–69% accuracy.	Student shows the process with less than 60% accuracy.

Chapter 3

Mathematics (M11101)

Content: Subtraction of the verticals does not exceed to 10

Time: 16 hours

Standard 1: Number and Algebra

Standard M1.1: Understand the variety of display numbers number systems, the operation of the numbers, the result of the operation, the treasures of action and to apply.

Grade level indicators

M1.1 Gr1/4 Look for the value of the unknown variable in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceeding 100 and 0.

M1.1 Gr1/5 Shows you how to find the answers to the problem of addition and find the answers to the problem of subtraction of the count not exceeding 100 and 0.

Learning Objective

Students will be taught to :

1. Understanding the Meaning of Addition and Subtraction, Calculating Sums and Differences, and Recognizing the Relationship Between Addition and Subtraction.
2. Solving Addition and Subtraction Word Problems, Creating Word Problems, and Determining the Correct Answers.

Learning Outcomes

Students will be able to:

1. Find the value of the unknown in a number sentence.
2. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.
3. Show you how to find the answers to the problem of addition
4. Find the answers to the problem of subtraction of the count not exceed 100 and 0.

Learning Areas

- The meaning of the addition and subtraction, the result of the addition and subtraction and the relation of addition and subtraction.
- Solving problems of addition and subtraction. And create solutions together to come up with an answer.

Teaching and Learning Activities

1. Students to practice look for the value of the unknown value in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.
2. Students do worksheet; show how to find the answers of word problems addition and word problems subtraction of the count not exceed 100 and 0.
3. Students do about test unit subtracting the vertically numbers are not exceeding to 10.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Finding the Value of an Unknown in Addition and Subtraction Number Sentences Involving Whole Numbers up to 100 and 0.	– Able to find the value of unknowns in symbolic addition and subtraction equations involving numbers not exceeding 100 and 0.	– Practice finding the value of unknowns in addition and subtraction equations with numbers not exceeding 100 and 0.
2. Worksheet on Showing Methods for Solving Addition and Subtraction Word Problems Involving Numbers up to 100 and 0.	– Able to show the process of solving addition and subtraction word problems involving numbers not exceeding 100 and 0.	– Practice Completing Worksheets Demonstrating Methods to Solve Addition and Subtraction Word Problems Involving Numbers up to 100 and Zero - Taking Unit Tests on Subtraction in Minuends Not Exceeding 10

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Finding the Value of Unknowns in Addition Equations with a Sum Not Exceeding 10	Student can find the value of unknowns in addition equations sums not exceeding 10 with 80% accuracy or higher.	Student can solve such equations with 70%–79% accuracy.	Student can solve such equations with 60%–69% accuracy.	Student can solve such equations with less than 60% accuracy.

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
2. Showing the Process of Solving Addition Word Problems (Sum Not Exceeding 10)	Student can clearly show the process of solving word problems with sums not exceeding 10 with 80% accuracy or higher.	Student can show the process with 70%–79% accuracy.	Student can show the process with 60%–69% accuracy.	Student shows the process with less than 60% accuracy.

Chapter 4

Mathematics (M11101)

Content: Cardinal number 11-20.

Time: 12 hours

Strand 1: Number and Algebra

Standard M1.1: Understand the variety of display numbers number systems, the operation of the number, the result of the operation, the treasures of action and to apply.

Grade level indicators

M 1.1 Gr1/1 Write and read Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers not exceeding 100, and 0.

M 1.1 Gr1/2 Compare of cardinal numbers not exceeding 100, and 0. Using the = $\neq$ > <.

M 1.1 Gr1/3 Arrange Number sequence not exceeding 100 and $\circ$ from 3 to 5 number.

Learning Objective

Students will be taught to:

1. Write and read Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers not exceeding 100, and 0.
2. Compare of cardinal numbers not exceeding 100, and 0. Using the = $\neq$ > <.
3. Arrange Number sequence not exceeding 100 and $\circ$ from 3 to 5 number.

Learning Outcomes

Students will be able to:

1. Write and read Hindu-Arabic and Thai numerals showing the quantity of objects or cardinal numbers not exceeding 100, and 0.
2. Compare cardinal numbers not exceeding 100, and 0. Using the = $\neq$ > <.
3. Arrange Number sequence not exceeding 100 and $\circ$ from 3 to 5 number.

Learning Areas

1. Counting by 1s and by 10s
2. Reading and writing Hindu-Arabic numerals and Thai numerals to represent quantities
3. Representing quantities using Thai numerals
4. Representing counting numbers up to 20 using part-whole relationships
5. Identifying ordinal positions
6. Place the value of digits in each position and writing numbers in expanded form
7. Comparing numbers using the symbols =, $\neq$, >, <
8. Arranging numbers

Teaching and Learning Activities

1. Students to practice write and read Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers not exceeding 100, and 0.
2. Students to practice compare of cardinal numbers not exceeding 100, and 0. Using the = $\neq$ > <.
3. Students to practice arrange Number sequence not exceeding 100 and 0 from 3 to 5 number.
4. Students do about test unit cardinal number 11-20.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Counting Objects to Represent Quantities, Reading and Writing Hindu-Arabic and Thai Numerals for Whole Numbers up to 100 and 0.	– Able to count objects representing given quantities, and read and write Hindu-Arabic and Thai numerals for whole numbers up to 100 and 0.	– Practice counting objects representing given quantities; reading and writing Hindu-Arabic and Thai numerals for whole numbers up to 100 and 0.
2. Worksheet on Comparing Whole Numbers up to 100 and Zero Using the Symbols =, $\neq$, >, <	– Able to compare whole numbers up to 100 and zero using the symbols =, $\neq$, >, <.	- Practice comparing whole numbers up to 100 and zero using the symbols =, $\neq$, >, <.
3. Worksheet on Ordering Whole Numbers up to 100 and Zero, Arranging from 3 to 5 Numbers.	- Able to order whole numbers up to 100 and zero, arranging from 3 to 5 numbers.	- Practice ordering whole numbers up to 100 and zero, arranging from 3 to 5 numbers. - Conducting a unit test on whole numbers from 11 to 20.

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Count objects representing given quantities; read and write Hindu-Arabic and Thai numerals for whole numbers from 11 to 20.	Students will be able to count objects representing given quantities, and read and write Hindu-Arabic and Thai numerals for whole numbers from 11 to 20 with 80% accuracy or higher.	Students will be able to count objects representing given quantities, and read and write Hindu-Arabic and Thai numerals for whole numbers from 11 to 20 with 70%–79% accuracy.	Students will be able to count objects representing given quantities, and read and write Hindu-Arabic and Thai numerals for whole numbers from 11 to 20 with 60%–69% accuracy.	Students will be able to count objects representing given quantities, and read and write Hindu-Arabic and Thai numerals for whole numbers from 11 to 20 with less than 60% accuracy.
2. Compare whole numbers from 11 to 20 using the symbols =, ≠, >, <.	Students will be able to compare whole numbers from 11 to 20 using the symbols =, ≠, >, and < with 80% accuracy or higher.	Students will be able to compare whole numbers from 11 to 20 using the symbols =, ≠, >, and < with 70%–79% accuracy.	Students will be able to compare whole numbers from 11 to 20 using the symbols =, ≠, >, and < with 60%–69% accuracy.	Students will be able to compare whole numbers from 11 to 20 using the symbols =, ≠, >, and < with less than 60% accuracy.
3. Arrange whole numbers from 11 to 20, arranging from 3 to 5 numbers.	Students will be able to order whole numbers from 11 to 20, arranging between 3 to 5 numbers with 80% accuracy or higher.	Students will be able to order whole numbers from 11 to 20, arranging between 3 to 5 numbers with 70%–79% accuracy.	Students will be able to order whole numbers from 11 to 20, arranging between 3 to 5 numbers with 60%–69% accuracy.	Students will be able to order whole numbers from 11 to 20, arranging between 3 to 5 numbers with less than 60% accuracy.

Chapter 5

Mathematics (M11101)

Content: Addition and subtraction of the count not exceed 20.

Time: 19 hours

Strand 1: Number and Algebra

Standard M1.1: Understand the variety of display numbers number systems, the operation of the number, the result of the operation, the treasures of action and To apply.

Grade level indicators

M1.1 Gr1/4 Write and read Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers not exceeding 100, and 0.

M1.1 Gr1/5 Arrange Number sequence not exceeding 100 and o from 3 to 5 number.

Learning Objective

Students will be taught to :

1. The meaning of addition, the meaning of subtraction, finding sums, finding differences, and the relationship between addition and subtraction.
2. Solving addition and subtraction word problems, as well as creating word problems.

Learning Outcomes

Students will be able to:

1. Understand the meaning of addition, the meaning of subtraction, finding sums, finding differences, and the relationship between addition and subtraction.
2. Solve addition and subtraction word problems, as well as create word problems.

Learning Areas

1. Understand the meaning of addition and subtraction, find sums and differences, and recognize the relationship between addition and subtraction.
2. Solving addition and subtraction word problems, as well as creating word problems.

Teaching and Learning Activities

1. Students to practice the meaning of the addition and subtraction the result of the addition and subtraction and relation of addition and subtraction.
2. Students to practice solving problems of addition and subtraction. And create solving problems together with to come up with an answer.
3. Students do about test unit addition and subtraction number of the count not exceed 20.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Finding the Value of an Unknown in Addition and Subtraction Number Sentences Involving Whole Numbers up to 100 and 0.	– Able to find the value of an unknown in addition and subtraction number sentences involving whole numbers up to 100 and 0.	– Practice finding the value of an unknown in addition and subtraction number sentences involving whole numbers up to 100 and 0.
2. Worksheet on Showing Methods for Solving Addition and Subtraction Word Problems Involving Numbers up to 100 and 0.	– Able to demonstrate methods for solving addition and subtraction word problems involving numbers up to 100 and 0.	- Practice demonstrating methods for solving addition and subtraction word problems involving numbers up to 100 and 0. - Conducting a unit test on addition and subtraction of whole numbers not exceeding 20.

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Finding the value of an unknown in addition and subtraction number sentences	Students will be able to find the value of an unknown in addition and subtraction number	Students will be able to find the value of an unknown in addition and subtraction number	Students will be able to find the value of an unknown in addition and subtraction number	Students will be able to find the value of an unknown in addition and subtraction number

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
involving numbers not exceeding 20.	sentences involving numbers not exceeding 20 with 80% accuracy or higher.	sentences involving numbers not exceeding 20 with 70%–79% accuracy.	sentences involving numbers not exceeding 20 with 60%–69% accuracy.	sentences involving numbers not exceeding 20 with less than 60% accuracy.
2. Demonstrate methods for solving addition and subtraction word problems involving numbers not exceeding 20.	Students will be able to demonstrate methods for solving addition and subtraction word problems involving numbers not exceeding 20 with 80% accuracy or higher.	Students will be able to demonstrate methods for solving addition and subtraction word problems involving numbers not exceeding 20 with 70%–79% accuracy.	Students will be able to demonstrate methods for solving addition and subtraction word problems involving numbers not exceeding 20 with 60%–69% accuracy.	Students will be able to demonstrate methods for solving addition and subtraction word problems involving numbers not exceeding 20 with less than 60% accuracy.

Chapter 6**Mathematics (M11101)****Content: The picture chart****Time: 7 hours**

Standard 3: Statistics and Probability

Standard M3.1: Understand statistical processes and use statistical knowledge to solve the problem.

Grade level indicators

M3.1 Gr1/1: Use the data from the picture chart to find out the problem. When 1 image is defined, replace 1 unit.

Learning Objective

Students will be taught to :

1. Use the data from the picture chart to find out the problem. When 1 image is defined, replace 1 unit.

Learning Outcomes

Students will be able to:

1. Use the data from the picture chart to find out the word problem.
2. 1 image is defined, replace 1 unit.

Learning Areas

- Read pictograms.

Teaching and Learning Activities

1. Students practice to use the data from the picture chart to find out the problem. When 1 image is defined, replace 1 unit.

2. Students do about test unit The picture chart.

Emphasized Skills:

1. Communication skills
2. Thinking skill
3. Problem-solving skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Using Data from Pictogram Charts to Solve Word Problems When One Picture Represents One Unit	– Use data from pictogram charts to solve word problems where one picture represents one unit.	- Practice using data from pictogram charts to find answers to word problems with one picture representing one unit. - Conduct a unit test on pictogram charts.

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Use data from pictogram charts to solve word problems when one picture represents one unit.	Students will be able to use data from pictogram charts to find the answers to word problems when one picture represents one unit with 80% accuracy or higher.	Students will be able to use data from pictogram charts to find the answers to word problems when one picture represents one unit with 70%–79% accuracy.	Students will be able to use data from pictogram charts to find the answers to word problems when one picture represents one unit with 60%–69% accuracy.	Students will be able to use data from pictogram charts to find the answers to word problems when one picture represents one unit with less than 60% accuracy.

Chapter 7**Mathematics (M11101)****Content: The weight****Time: 13 hours**

Strand 2: Measurement And Geometry

Standard M2.1: Basic understanding of measurement Measuring and estimating the size of the measure and apply.

Grade level indicators

M2.1 Gr1/2 Measure and compare the weight in kilograms to gram.

Learning Objective

Students will be taught to :

1. Measure and compare the weight in kilograms to gram.

Learning Outcomes

Students will be able to:

1. Measure the weight in kilograms to gram.
2. Compare the weight in kilograms to gram.

Learning Areas

- Weight measurement units using non-standard units.
- Measuring weight in kilograms and grams.
- Weight comparison in kilograms to grams.
- Problem solving addition and subtraction about weight in kilograms to grams.

Teaching and Learning Activities

1. Students practice to measure and compare the weight in kilograms to grams.
2. Students do about test unit The weight.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Measuring and Comparing Weights in Kilograms and Grams.	– Able to measure and compare weights in kilograms and grams.	- Practice measuring and comparing weights in kilograms and grams. - Conduct a unit test on weight measurement.

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Measuring and Comparing Weights in Kilograms and Grams.	Students will be able to measure and compare weights in kilograms and grams with 80% accuracy or higher.	Students will be able to measure and compare weights in kilograms and grams with 70%–79% accuracy.	Students will be able to measure and compare weights in kilograms and grams with 60%–69% accuracy.	Students will be able to measure and compare weights in kilograms and grams with less than 60% accuracy.

Chapter 8

Mathematics (M11101)

Content: Position and Ordinal Numbers

Time: 8 hours

Strand 2: Measurement And Geometry

Standard M2.2: Solving measurement problems

Grade level indicators

Describe the positions of objects using positional words, indicate the location of objects according to their given order, and apply the knowledge of ordinal numbers.

Learning Objective

Students will be taught to :

1. Describe the positions of objects using positional words, indicate the location of objects according to their given order, and apply the knowledge of ordinal numbers.

Learning Outcomes

Students will be able to:

1. Describe the positions of objects using positional words, indicate the location of objects according to their given order, and apply the knowledge of ordinal numbers.

Learning Areas

Identifying ordinal numbers

Teaching and Learning Activities**Emphasized Skills:**

1. Thinking skill
2. Problem-solving skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on describing the Position of Objects.	– Able to identify the position of objects.	- Practice telling the position of objects using positional words.
2. Worksheet on Identifying the Order of Objects	– Able to identify the order of objects.	- Practice telling the ordinal numbers of objects
3. Worksheet on telling Ordinal Numbers of Objects	– Able to show objects according to their position and order.	- Practice showing objects according to their position and ordinal number - Unit test on the topic of position and order

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Identify the position of objects.	Students will be able to identify the position of objects with 80% accuracy or higher.	Students will be able to identify the position of objects with 70%–79% accuracy.	Students will be able to identify the position of objects with 60%–69% accuracy.	Students will be able to identify the position of objects with less than 60% accuracy.
2. Identify the order of objects.	Students will be able to identify the order of objects with 80% accuracy or higher.	Students will be able to identify the order of objects with 70%–79% accuracy.	Students will be able to identify the order of objects with 60%–69% accuracy.	Students will be able to identify the order of objects with less than 60% accuracy.

Assessment Item	Assessment Criteria			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
3. Show objects according to their position and order.	Students will be able to show objects according to their position and order with 80% accuracy or higher.	Students will be able to show objects according to their position and order with 70%–79% accuracy.	Students will be able to show objects according to their position and order with 60%–69% accuracy.	Students will be able to show objects according to their position and order with less than 60% accuracy.

Chapter 9

Mathematics (M11101)

Content: Geometry

Time: 15 hours

Strand 1: Numbers and Operations

Standard M1.2: Understanding results of operations of numbers, relationships of operations, and application of operations for problem-solving.

Strand 2: Measurement And Geometry

Standard M2.2: Understanding and analyzing geometric patterns The Treasure of geometry is the relationship between geometric shapes and geometric theorem and applied.

Grade level indicators

M1.2 Gr1/1 Specifies the number that is missing in the form of a number increases or decreases by 1 and 10 and identify the missing image in a repeating pattern of the geometry and other images where each of the repeating series members has 2 images.

M2.2 Gr1/1 Distinguish triangles, squares, circles, sphere, cylinder, and cones.

Learning Objective

Students will be taught to :

1. Distinguish triangles, Rectangle, sphere, cylinder, and cones.
2. Distinguish squares, circles and oval.
3. Other images where each of the repeating series.
4. Creating a pattern of geometric figures.

Learning Outcomes

Students will be able to:

1. Distinguish triangles, Rectangle, sphere, cylinder, and cones.
2. Distinguish squares, circles and oval.
3. Other images where each of the repeating series.
4. Creating a pattern of geometric figures.

Learning Areas

- Distinguish triangles, Rectangle, sphere, cylinder, and cones.
- Distinguish squares, circles and oval.
- Other images where each of the repeating series.

Teaching and Learning Activities

1. Students practice to distinguish triangles, Rectangle, sphere, cylinder, and cones.
2. Students tell the things that surround the components of a rectangular shape, a cylindrical sphere, or a cone.
3. Students tell the distinguish squares, circles and oval.
4. Students practice to creating a pattern of geometric figures.
5. Students do about test unit geometry

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Classifying Rectangular Prisms, Spheres, Cylinders, and Cones	– Able to classify rectangular prisms, spheres, cylinders, and cones.	- Practice classifying rectangular prisms, spheres, cylinders, and cones.
2. Worksheet on Classifying Triangles, Quadrilaterals, Circles, and Ovals	– Able to classify triangles, quadrilaterals, circles, and ovals.	- Practice classifying triangles, quadrilaterals, circles, and ovals.
3. Worksheet on Repeating Patterns of Geometric Shapes and Other Figures	– Able to complete repeating patterns of geometric shapes and other figures.	- Practice completing repeating patterns of geometric shapes and other figures.
4. Worksheet on Creating Repeating Patterns of Geometric Shapes and Other Figures	– Able to create repeating patterns of geometric shapes and other figures.	- Practice creating repeating patterns of geometric shapes and other figures. - Conduct a unit test on geometric shapes.

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Classify rectangular prisms, spheres, cylinders, and cones.	Students will be able to classify rectangular prisms, spheres, cylinders, and cones with 80% accuracy or higher.	Students will be able to classify rectangular prisms, spheres, cylinders, and cones with 70%–79% accuracy.	Students will be able to classify rectangular prisms, spheres, cylinders, and cones with 60%–69% accuracy.	Students will be able to classify rectangular prisms, spheres, cylinders, and cones with less than 60% accuracy.
2. Classify triangles, quadrilaterals, circles, and ovals.	Students will be able to classify triangles, quadrilaterals, circles, and ovals with 80% accuracy or higher.	Students will be able to classify triangles, quadrilaterals, circles, and ovals with 70%–79% accuracy.	Students will be able to classify triangles, quadrilaterals, circles, and ovals with 60%–69% accuracy.	Students will be able to classify triangles, quadrilaterals, circles, and ovals with less than 60% accuracy.
3. Complete repeating patterns of geometric shapes and other figures.	Students will be able to complete repeating patterns of geometric shapes and other figures from given tasks with 80% accuracy or higher.	Students will be able to complete repeating patterns of geometric shapes and other figures from given tasks with 70%–79% accuracy.	Students will be able to complete repeating patterns of geometric shapes and other figures from given tasks with 60%–69% accuracy.	Students will be able to complete repeating patterns of geometric shapes and other figures from given tasks with less than 60% accuracy.
4. Create repeating patterns of geometric shapes and other figures.	Students will be able to create repeating patterns of geometric shapes and	Students will be able to create repeating patterns of geometric shapes and other figures	Students will be able to create repeating patterns of geometric shapes and other figures	Students will be able to create repeating patterns of geometric shapes and other figures

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	other figures with 80% accuracy or higher.	with 70%–79% accuracy.	with 60%–69% accuracy.	with less than 60% accuracy.

Chapter 10

Mathematics (M11101)

Content: Cardinal number 21-100

Time: 17 hours

Strand 1: Number and Algebra

Standard M1.1: Understand the variety of display numbers number systems Operation of the number The result of the operation Treasures of action and to apply.

Grade level indicators

M1.1 Gr1/1 Write and read Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers not exceeding 100, and 0.

M1.1 Gr1/2 Compare of cardinal numbers not exceeding 100, and 0. Using the = $\neq$ > < .

M1.1 Gr1/3 Arrange Number sequence not exceeding 100 and $\circ$ from 3 to 5 number. by 1 and 10

Learning Objective

Students will be taught to :

1. A number of things and shows things in a given number 21 to 100.
2. Write and read Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers 21-100.
3. Compare and Arrange Number 21-100.

Learning Outcomes

Students will be able to:

1. Number of things and shows things in a given number 21 to 100.
2. Write Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers 21-100.
3. Read Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers 21-100.
4. Compare Number 21-100.
5. Arrange Number 21-100.

Learning Areas

- Counts each 1 and each 10
- Read Hindu-Arabic and Thai numerals showing quantity of objects.
- Display Count not exceeding 20 The relationship of a number of small parts (part – whole relationship)
- giving information counting number.

- The digit value of the numbered digits in each digit and the writing number represents the number in the scatter figure.
- Compare of cardinal numbers not exceeding 100, and 0. Using the = $\neq$ > <
- Arrange Number sequence.

Teaching and Learning Activities

1. Students practice to number of things and shows things in a given number 21 to 100.
2. Students practice to write and read Hindu-Arabic and Thai numerals showing quantity of objects or cardinal numbers 21-100.
3. Students practice to compare and Arrange Number 21-100.
4. Students practice to the pattern of increases or decreases by 1 and 10.
5. Students practice to said the number of missing in a given pattern.
6. Students do about test unit Cardinal number 21-100

Emphasized Skills:

1. Thinking skill
2. Communication skills

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Counting Objects and Representing Them According to Given Quantities from 21 to 100.	– Able to count objects and represent them according to given quantities from 21 to 100.	– Practice counting objects and representing them according to given quantities from 1 to 100.
2. Worksheet on Reading and Writing Hindu-Arabic. Numerals, Thai Numerals, and Number Words from 21 to 100.	– Able to read and write Hindu-Arabic numerals, Thai numerals, and number words from 21 to 100.	– Practice reading and writing Hindu-Arabic numerals, Thai numerals, and number words from 21 to 100.
3. Worksheet on Comparing and Ordering Whole Numbers from 21 to 100.	– Able to compare and order whole numbers from 21 to 100.	- Practice comparing and ordering whole numbers from 21 to 100. - Practice describing patterns that increase or decrease
4. Patterns of Numbers.	Number patterns increasing or decreasing by 1 and by 10.	- Practice identifying missing numbers in given patterns. - Conduct a unit test on whole numbers from 21 to 100.

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Count objects and represent them according to given quantities from 21 to 100.	Students will be able to count objects and represent them according to given quantities from 21 to 100 with 80% accuracy or higher.	Students will be able to count objects and represent them according to given quantities from 21 to 100 with 70%–79% accuracy.	Students will be able to count objects and represent them according to given quantities from 21 to 100 with 60%–69% accuracy.	Students will be able to count objects and represent them according to given quantities from 21 to 100 with less than 60% accuracy.
2. Read and write Hindu-Arabic numerals, Thai numerals, and number words from 21 to 100.	Students will be able to read and write Hindu-Arabic numerals, Thai numerals, and number words from 21 to 100 with 80% accuracy or higher.	Students will be able to read and write Hindu-Arabic numerals, Thai numerals, and number words from 21 to 100 with 70%–79% accuracy.	Students will be able to read and write Hindu-Arabic numerals, Thai numerals, and number words from 21 to 100 with 60%–69% accuracy.	Students will be able to read and write Hindu-Arabic numerals, Thai numerals, and number words from 21 to 100 with less than 60% accuracy.
3. Compare and order whole numbers from 21 to 100.	Students will be able to compare and order whole numbers from 21 to 100 with 80% accuracy or higher.	Students will be able to compare and order whole numbers from 21 to 100 with 70%–79% accuracy.	Students will be able to compare and order whole numbers from 21 to 100 with 60%–69% accuracy.	Students will be able to compare and order whole numbers from 21 to 100 with less than 60% accuracy.

Chapter 11**Mathematics (M11101)****Content: Length measurement****Time: 14 hours**

Strand 2: Measurement And Geometry

Standard M2.1: Basic understanding of measurement Measuring and estimating the size of the measure and apply.

Grade level indicators

M2.1 Gr1/1 Measure and compare lengths in centimeters to meters.

Learning Objective

Students will be taught to :

1. Compare the lengths that are longer than shorter than the shortest length shorter than equal highest shortest.
2. Measure and compare lengths in centimeters to meters.

Learning Outcomes

Students will be able to:

1. Compare the lengths that are longer than shorter than the shortest length shorter than equal highest shortest
2. Measure and compare lengths in centimeters to meters.

Learning Areas

- Measuring the length using non-standard units.
- Measuring length in centimeters to meters.

Teaching and Learning Activities

1. Students practice comparing the lengths of things directly using the corresponding items.
2. Students practice measuring the lengths of things using non-standard.
3. Students practice measure and compare lengths in centimeters to meters.
4. Students do about test unit length measurement

Emphasized Skills:

1. Communication skills
2. Thinking skills
3. Problem-solving skills
4. Life skills

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Comparing Lengths.	– Able to compare lengths using terms such as longer than, shorter than, taller than, shorter than, equal to, longest, shortest, tallest, and shortest.	– Practice comparing the lengths of objects by directly comparing them.
2. Worksheet on Measuring and Comparing Lengths in Centimeters and Meters.	– Able to Measure and compare lengths using units of centimeters and meters.	– Practice measuring the lengths of objects using non-standard units. - Practice measuring and comparing lengths using centimeters and meters. - Conduct a unit test on length measurement.

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Compare lengths using terms such as longer than, shorter than, taller than, shorter than, equal to, longest, shortest, tallest, and shortest.	Students will be able to compare lengths using terms such as longer than, shorter than, taller than, shorter than, equal to, longest, shortest, tallest, and shortest.	Students will be able to compare lengths using terms such as longer than, shorter than, taller than, shorter than, equal to, longest, shortest, tallest, and shortest with	Students will be able to compare lengths using terms such as longer than, shorter than, taller than, shorter than, equal to, longest, shortest, tallest, and shortest with	Students will be able to compare lengths using terms such as longer than, shorter than, taller than, shorter than, equal to, longest, shortest, tallest, and shortest with

Assessment Item	Assessment Criteria			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	shortest, tallest, and shortest with 80% accuracy or higher.	70%–79% accuracy.	60%–69% accuracy.	less than 60% accuracy.
2. Measure and compare lengths using centimeters and meters.	Students will be able to measure and compare lengths using centimeters and meters with 80% accuracy or higher.	Students will be able to measure and compare lengths using centimeters and meters with 70%–79% accuracy.	Students will be able to measure and compare lengths using centimeters and meters with 60%–69% accuracy.	Students will be able to measure and compare lengths using centimeters and meters with less than 60% accuracy.

Chapter 12

Mathematics (M11101)

Content: Subtraction two numbers are not exceeding to 100.

Time: 12 hours

Strand 1: Number and Algebra

Standard M1.1: Understand the diversity of number representations, number systems, operations on numbers, the results of operations, properties of operations, and their applications.

Grade level indicators

M1.1 Gr1/4 Look for the value of the unknown value in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.

Learning Objective

Students will be taught to :

1. Look for the value of the unknown value in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.

Learning Outcomes

Students will be able to:

1. Look for the value of the unknown value in the sentence.
2. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.

Learning Areas

- The meaning of the addition and subtraction the result of the addition and subtraction and relation of addition and subtraction.
- Solving problems of addition and subtraction. And create solving problems together with to come up with an answer.

Teaching and Learning Activities

1. Students practice look for the value of the unknown value in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.
2. Students practice shows you how to find the answers to the problem of addition and find the answers to the problem of subtraction of the count not exceed 100 and 0.
3. Students do about test unit subtraction two numbers are not exceeding to 100.

Emphasized Skills:

1. Life skills
2. Thinking skill
3. Problem-solving skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on finding the value of unknowns in addition and subtraction symbolic sentences involving whole numbers up to 100 and 0.	– Able to find the value of unknowns in addition and subtraction symbolic sentences involving whole numbers up to 100 and 0.	– Practice finding the value of unknowns in addition and subtraction symbolic sentences involving whole numbers up to 100 and 0.
2. Worksheet on showing methods to find solutions for addition and subtraction word problems involving whole numbers up to 100 and 0.	– Able to find the value of unknowns in addition and subtraction symbolic sentences involving whole numbers up to 100 and 0.	– Practice demonstrating methods to find solutions for addition and subtraction word problems involving whole numbers up to 100 and 0. - Take a unit test on addition with sums not exceeding 10.

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Find the value of the unknown in addition symbolic sentences involving whole numbers up to 100.	Students will be able to find the value of the unknown in addition symbolic sentences involving whole numbers up to 100 with 80% accuracy or higher.	Students will be able to find the value of the unknown in addition symbolic sentences involving whole numbers up to 100 with 70%–79% accuracy.	Students will be able to find the value of the unknown in addition symbolic sentences involving whole numbers up to 100 with 60%–69% accuracy.	Students will be able to find the value of the unknown in addition symbolic sentences involving whole numbers up to 100 with less than 60% accuracy.

Chapter 13

Mathematics (M11101)

Content: Subtraction two numbers are not exceeding to 100.

Time: 16 hours

Strand 1: Number and Algebra

Standard M1.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Grade level indicators

M1.1 Gr1/4 Look for the value of the unknown value in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.

Learning Objective

Students will be taught to :

1. Look for the value of the unknown value in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.

Learning Outcomes

Students will be able to:

1. Look for the value of the unknown value in the sentence.
2. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.

Learning Areas

- The meaning of the addition and subtraction the result of the addition and subtraction and relation of addition and subtraction.
- Solving problems of addition and subtraction. And create solving problems together with to come up with an answer.

Teaching and Learning Activities

1. Students practice look for the value of the unknown value in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.
2. Students practice shows you how to find the answers to the problem of addition and find the answers to the problem of subtraction of the count not exceed 100 and 0.
3. Students do about test unit subtraction two numbers are not exceeding to 100.

Emphasized Skills:

1. Life skills
2. Thinking skill
3. Problem-solving skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Finding the Value of Unknowns in Addition and Subtraction Sentences Involving Whole Numbers up to 100 and 0.	– Able to find the value of the unknown in addition and subtraction symbolic sentences involving whole numbers up to 100 and 0.	- Practice finding the value of unknowns in addition and subtraction symbolic sentences involving whole numbers up to 100 and 0.
2. Worksheet on Showing Methods for Solving Addition and Subtraction Word Problems Involving Whole Numbers up to 100 and 0.	– Able to show methods for solving addition and subtraction word problems involving whole numbers up to 100 and 0.	- Practice demonstrating methods for solving addition and subtraction word problems involving whole numbers up to 100 and 0. - Take a unit test on subtraction involving whole numbers up to 100.

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Finding the Value of the unknown in subtraction sentences where	Student can find the value of the unknown in subtraction sentences where the	Student can find the value of the unknown in subtraction sentences where the minuend	Student can find the value of the unknown in subtraction sentences where the minuend	Student can find the value of the unknown in subtraction sentences where the minuend

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
the minuend does not exceed 100.	minuend does not exceed 100 with 80% accuracy or higher.	does not exceed 100 with 70%–79% accuracy.	does not exceed 100 with 60%–69% accuracy.	does not exceed 100 with less than 60% accuracy.

Chapter 14

Mathematics (M11101)

Content: Word problem of Addition and subtraction

Time: 18 hours

Strand 1: Number and Algebra

Standard M1.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Grade level indicators

M1.1 Gr1/4 Look for the value of the unknown value in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.

M1.1 Gr1/5 Show you how to find the answers to the problem of addition and find the answers to the problem of subtraction of the count not exceed 100 and 0.

Learning Objective

Students will be taught to :

1. Look for the value of the unknown value in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.
2. Show you how to find the answers to the problem of addition and find the answers to the problem of subtraction of the count not exceed 100 and 0.

Learning Outcomes

Students will be able to:

1. Look for the value of the unknown value in the sentence.
2. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.
3. Show you how to find the answers to the problem of addition and find the answers to the problem of subtraction of the count not exceed 100 and 0.

Learning Areas

- The meaning of the addition and subtraction the result of the addition and subtraction and relation of addition and subtraction.
- Solving problems of addition and subtraction. And create solving problems together with to come up with an answer.

Teaching and Learning Activities

1. Students practice look for the value of the unknown value in the sentence. The addition indicator and the symbol of the subtraction number of the count not exceed 100 and 0.
2. Students practice shows you how to find the answers to the problem of addition and find the answers to the problem of subtraction of the count not exceed 100 and 0.
3. Students do about test unit word problem of Addition and subtraction.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Finding the Value of Unknowns in Addition and Subtraction Sentences Involving Whole Numbers up to 100 and 0.	– Able to find the value of unknowns in addition and subtraction sentences involving whole numbers up to 100 and 0.	– Practice finding the value of unknowns in addition and subtraction sentences involving whole numbers up to 100 and 0.
2Worksheet on Demonstrating Methods for Solving Addition and Subtraction Word Problems Involving Whole Numbers up to 100 and 0.	– Able to demonstrate methods for solving addition and subtraction word problems involving whole numbers up to 100 and 0.	- Practice demonstrating methods for solving addition and subtraction word problems involving whole numbers up to 100 and 0. - Take a unit test on addition and subtraction word problems.

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Finding the value of the unknown in addition and subtraction sentences involving whole numbers up to 100.	Students will be able to find the value of the unknown in addition and subtraction sentences involving whole numbers up to 100 with 80% accuracy or higher.	Students will be able to find the value of the unknown in addition and subtraction sentences involving whole numbers up to 100 with 70%–79% accuracy.	Students will be able to find the value of the unknown in addition and subtraction sentences involving whole numbers up to 100 with 60%–69% accuracy.	Students will be able to find the value of the unknown in addition and subtraction sentences involving whole numbers up to 100 with less than 60% accuracy.
2. Demonstrate methods for solving addition and subtraction word problems involving whole numbers up to 100.	Students will be able to demonstrate methods for solving addition and subtraction word problems involving whole numbers up to 100 with 80% accuracy or higher.	Students will be able to demonstrate methods for solving addition and subtraction word problems involving whole numbers up to 100 with 70%–79% accuracy.	Students will be able to demonstrate methods for solving addition and subtraction word problems involving whole numbers up to 100 with 60%–69% accuracy.	Students will be able to demonstrate methods for solving addition and subtraction word problems involving whole numbers up to 100 with less than 60% accuracy.

Grade 2 Unit Design Framework

Chapter 1**Mathematics (M12101)****Content: Numbers up to 1,000****Time: 20 hours**

Strand 1: Numbers and Operations

Standard M1.1: Understanding of diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr2/1 Write and read Hindu-Arabic and Thai numerals and written forms showing quantity of objects or cardinal numbers not exceeding 1,000, and 0.

M1.1 Gr2/2 Compare and arrange sequence of cardinal numbers not exceeding 1,000, and 0.

M1.1 Gr2/3 Sort numbers up to 1,000 and 0 from 3 to 5 numbers from various situations.

Learning Objective

Students will be taught to :

- 1.Counting by 2s, 5s, 10s, and 100s
- 2.Reading and writing Hindu-Arabic numerals, Thai numerals, and number words
- 3.Even and odd numbers
- 4.Place value, the value of each digit, and expanded form of numbers
- 5.Comparing and ordering numbers
- 6.Number patterns that increase or decrease by 2s, 5s, or 100s

Learning Outcomes

Students will be able to:

1. Count, read and write numbers up to 1,000 in Arabic numerals.
2. Identify place value and value of each digit in a number.
3. Write numbers in expanded form.
4. Compare and order numbers up to 1,000.
5. Count forward and count backward by 1s, 2s, 5s and 100s.
6. Extend number sequence.
7. Complete missing terms in given number sequences.
8. Use ordinal numbers to name position.

Learning Areas

- Counting up to 1,000
- Reading and writing numbers
- Place values of digits
- Writing numbers in expanded form
- Comparing and ordering numbers
- Number patterns when counting forward and backward
- Using numbers to name positions

Teaching and Learning Activities

1. Get a lot of marbles or sticks for students to count.
2. Guide them on how to count up to 1,000, in hundreds, tens and ones.
3. Test students' memory on spelling numbers from 0 to 20. They need to memorize them and this

includes the word 'hundred' and 'thousand'.

4. Write a three-digit number on the board and explain the place values of each digit and its value.

Emphasize that even a zero in a number has a place value.

5. For this section, students need to be good at place value. It is better for them to present a number

with a place value table first before writing it in expanded form. Try a few numbers with them and remember to have numbers with zero.

6. Remind students of the signs of comparison and the terms used in comparison such as 'greater

than', 'more than', 'less than', 'smaller than', 'equal' and 'not equal to'.

7. Emphasize to students to first compare the number of digits when comparing two numbers before

comparing the values of the leftmost digits. Use an abacus to ease your explanation.

8. Remind students the meanings of ascending and descending.
9. Guide students to count forward and backward by ones, fives, tens and hundreds.
10. Guide them on how to analyze a number pattern by comparing every two consecutive numbers.
11. Explain how we use ordinal numbers.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill

Workpiece / Task Responsibility

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on counting by 2s, 5s, 10s, and 100s	- Accurately count objects by 2s (e.g., 2, 4, 6, 8, 10, 12...) or by 5s (e.g., 5, 10, 15, 20, 25...) as specified by the given criteria.	- Learn how to count and determine quantities by grouping in 2s or 5s. Practice with number sequences such as 2, 4, 6... and 5, 10, 15...
2. Worksheet on reading and writing Hindu-Arabic numerals, Thai numerals, and number words	- Accurately read and write numbers in Hindu-Arabic numerals, Thai numerals, and number words as specified by the criteria.	- Learn to read and write numbers in different formats: Hindu-Arabic, Thai numerals, and number words.
3. Worksheet on even and odd numbers	- Correctly identify even and odd numbers according to the given criteria.	- Learn to distinguish between even and odd numbers.
4. Worksheet on place value, value of digits, and expanded form	- Identify the place and value of each digit and correctly express numbers in expanded form by adding the values of each digit according to the specified criteria.	- Learn about place value and the value of digits in each place. Practice writing numbers in expanded form using the sum of values of each digit.
5. Worksheet on comparing and ordering numbers	- Correctly compare two numbers using the terms "equal to," "greater than," or "less than," and the symbols =, >, < according to the criteria. - Accurately order numbers by identifying the greatest and smallest values, then arranging them in ascending or descending order.	- Learn how to compare two numbers using terms and symbols (=, >, <). - Learn how to order numbers by first identifying the greatest and smallest numbers, then arranging them from least to greatest or greatest to least.
6. Worksheet on number patterns increasing or decreasing by 2s, 5s, or 100s	- Correctly identify number patterns increasing by 2, 5, or 100 where numbers follow a consistent and continuous pattern. - Correctly identify number patterns decreasing by 2, 5, or 100 where numbers follow a	- Learn about number patterns that increase by 2, 5, or 100, and identify sequences with consistent progression. - Learn about number patterns that decrease by 2, 5, or 100, and identify sequences with consistent regression.

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
	consistent and continuous pattern.	

Assessment Components

1. Achieve a score of at least 60%.
2. Achieve a minimum performance level of 2 or above.
3. Achieve a minimum performance level of 2 or above.

Assessment Criteria

Assessment Criteria	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Counting by 2s, 5s, 10s, and 100s	Student can count objects by 2s (2, 4, 6, 8, 10, 12...) or 5s (5, 10, 15, 20, 25...) with 80% accuracy or more.	Student can count objects by 2s (2, 4, 6, 8, 10, 12...) or 5s (5, 10, 15, 20, 25...) with 70–79% accuracy.	Student can count objects by 2s (2, 4, 6, 8, 10, 12...) or 5s (5, 10, 15, 20, 25...) with 60–69% accuracy.	Student can count objects by 2s (2, 4, 6, 8, 10, 12...) or 5s (5, 10, 15, 20, 25...) with less than 60% accuracy.
2. Reading and Writing Hindu-Arabic numerals, Thai numerals, and number words	Student can accurately read and write numbers in Hindu-Arabic numerals, Thai numerals, or number words with 80% or more.	Student can accurately read and write numbers in Hindu-Arabic numerals, Thai numerals, or number words with 70–79% accuracy.	Student can accurately read and write numbers in Hindu-Arabic numerals, Thai numerals, or number words with 60–69% accuracy.	Student can accurately read and write numbers in Hindu-Arabic numerals, Thai numerals, or number words with less than 60% accuracy.
3. Identifying Even and Odd Numbers	Student can correctly identify even and odd numbers with 80% or more.	Student can correctly identify even and odd numbers with 70–79% accuracy.	Student can correctly identify even and odd numbers with 60–69% accuracy.	Student can correctly identify even and odd numbers with less than 60% accuracy.

Assessment Criteria	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
4. Place Value, Value of Digits, and Expanded Form	Student can identify the place and value of digits, and express numbers in expanded form (sum of digit values) with 80% or more.	Student can identify the place and value of digits, and express numbers in expanded form (sum of digit values) with 70–79% accuracy.	Student can identify the place and value of digits, and express numbers in expanded form (sum of digit values) with 60–69% accuracy.	Student can identify the place and value of digits, and express numbers in expanded form (sum of digit values) with less than 60% accuracy.
5. Comparing and Ordering Numbers	Student can compare two numbers using “equal to”, “greater than”, “less than” and symbols ($=$, $<$, $>$), and correctly order numbers from greatest to least or least to greatest with 80% or more.	Student can compare two numbers using “equal to”, “greater than”, “less than” and symbols ($=$, $<$, $>$), and correctly order numbers from greatest to least or least to greatest with 70–79% accuracy.	Student can compare two numbers using “equal to”, “greater than”, “less than” and symbols ($=$, $<$, $>$), and correctly order numbers from greatest to least or least to greatest with 60–69% accuracy.	Student can compare two numbers using “equal to”, “greater than”, “less than” and symbols ($=$, $<$, $>$), and correctly order numbers from greatest to least or least to greatest with less than 60% accuracy.
6. Number Patterns (Increasing or Decreasing by 2s, 5s, 100s)	Student can identify number patterns that increase or decrease by 2, 5, or 100 in a consistent sequence with 80% or more.	Student can identify number patterns that increase or decrease by 2, 5, or 100 in a consistent sequence with 70–79% accuracy.	Student can identify number patterns that increase or decrease by 2, 5, or 100 in a consistent sequence with 60–69% accuracy.	Student can identify number patterns that increase or decrease by 2, 5, or 100 in a consistent sequence with less than 60% accuracy.

Chapter 2

Mathematics (M12101)

Content: Addition and Subtraction within 1,000

Time: 24 hours

Strand 1: Numbers and Operations

Standard M1.1: Understanding of diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr2/4 Find the value of the unknown in the addition and subtraction statements of numbers up to 1000 and 0.

M1.1 Gr2/8 Shows how to find the answer to the 2-step problem of numbers up to 1000 and 0.

Learning Objective

Students will be taught to :

1. Perform addition of numbers within 1000.
2. Perform subtraction of numbers within 1000.
3. Perform computations involving addition and subtraction to solve word problems.

Learning Outcomes

Students will be able to:

1. Add up two numbers without regrouping and with regrouping.
2. Add up three numbers.
3. Subtract without regrouping and with regrouping.
4. Relate the relationship between addition and subtraction.
5. Solve problems involving addition and subtraction within 100

Learning Areas

1. Addition within 1,000
2. Subtraction within 1,000
3. Using subtraction to solve word problems

Teaching and Learning Activities

1. Remind students what addition means.
2. Guide students to add without grouping using the standard written method. Emphasize that they should add up digits of the same place values.
3. Write a few additions without regrouping questions on the board for students to solve. Discuss with them.
4. Guide students to add with regrouping using the standard written method.
5. Write a few addition questions on the board and get a few students to answer them. Guide them on how to verify of the answers.
6. Remind students of the meaning of subtraction.
7. Write a few subtraction questions on the board and get a few students to answers them. Discuss the answers with them. Guide them to verify the answers.
8. Explain the relationship between addition and subtraction and how we use this relationship to check for accuracy.
9. Explain how to solve word problems.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Addition of Numbers up to 1,000	- Find the sum in addition sentences involving numbers up to 1,000. - Accurately find the value of unknowns in addition sentences with numbers up to 1,000, according to the specified criteria.	- Learn how to add two numbers using number lines, hundred charts, tens charts, and unit charts. - Practice column addition. - Understand the commutative property of addition (changing the order does not change the sum). - Practice addition of three numbers.
2. Worksheet on Subtraction of Numbers up to 1,000	- Find the difference in subtraction sentences involving numbers up to 1,000. - Accurately find the value of unknowns in subtraction sentences	- Learn how to subtract two numbers using number lines, hundred charts, tens charts, and unit charts. - Understand that the difference

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
	with numbers up to 1,000, according to the specified criteria.	plus the subtrahend equals the minuend. - Practice column subtraction with two and three numbers.
3. Worksheet on Solving and Creating Word Problems	- Accurately find the value of unknowns in both addition and subtraction sentences involving numbers up to 1,000, according to the criteria. - Show appropriate methods to solve both addition and subtraction word problems. - Correctly create word problems involving addition and subtraction, according to the criteria.	- Learn the relationship between addition and subtraction. - Find unknown values in addition and subtraction sentences. - Solve word problems and practice creating addition and subtraction word problems.

Assessment Components

1. Students must score at least 60%.
2. Students must achieve a performance level of 2 or higher.
3. Students must achieve a performance level of 2 or higher.

Assessment Criteria and Performance Levels

Assessment Criteria	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Finding the unknown value in addition sentences (within 1,000 and 0)	The student can find the unknown value in addition sentences involving whole numbers up to 1,000 and 0 with 80% accuracy or more.	The student can find the unknown value in addition sentences involving whole numbers up to 1,000 and 0 with 70–79% accuracy.	The student can find the unknown value in addition sentences involving whole numbers up to 1,000 and 0 with 60–69% accuracy.	The student can find the unknown value in addition sentences involving whole numbers up to 1,000 and 0 with less than 60% accuracy.

Assessment Criteria	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
2. Finding the unknown value in subtraction sentences (within 1,000 and 0)	The student can find the unknown value in subtraction sentences involving whole numbers up to 1,000 and 0 with 80% accuracy or more.	The student can find the unknown value in subtraction sentences involving whole numbers up to 1,000 and 0 with 70–79% accuracy.	The student can find the unknown value in subtraction sentences involving whole numbers up to 1,000 and 0 with 60–69% accuracy.	The student can find the unknown value in subtraction sentences involving whole numbers up to 1,000 and 0 with less than 60% accuracy.
3. Showing the solution steps in addition and subtraction word problems	The student can clearly show the steps to solve addition and subtraction word problems involving whole numbers up to 1,000 and 0 with 80% accuracy or more.	The student can clearly show the steps to solve addition and subtraction word problems involving whole numbers up to 1,000 and 0 with 70–79% accuracy.	The student can clearly show the steps to solve addition and subtraction word problems involving whole numbers up to 1,000 and 0 with 60–69% accuracy.	The student can clearly show the steps to solve addition and subtraction word problems involving whole numbers up to 1,000 and 0 with less than 60% accuracy.

Chapter 3

Mathematics (M12101)

Content: Measurement

Time: 15 hours

Strand 2: Measurement

Standard M 2.1 Basic understanding of measurement Measuring and estimating the size of the measure and apply.

Grade level indicators

M2.1 Gr2/2 Tell length in metres and centimetres, and compare length by using the same unit.

M2.1 Gr2/3 Tell volume and capacity in litres, and compare volume and capacity.

Learning Objective

Students will be taught to :

1. Measure and compare lengths using standard units.
2. Solve word problems involving length.

Learning Outcomes

Students will be able to:

1. Measure and record lengths of objects in meters and centimeters.
2. Know the relationship between meters and centimeters.
3. Read scales to the nearest division.
4. Measure and record distances of two points in meters and centimeters.
5. Compare lengths of objects in meters and centimeters.
6. Solve words problems involving length.

Learning Areas

- Measuring length in meters and centimeters
- Measuring distance
- Comparing length
- Solving word problems involving length

Teaching and Learning Activities

1. Briefly explain what length is.
2. Show students some standard measuring tools such as meter rulers, rulers, measuring tapes and metal measuring tapes.
3. Show them how long a meter and a centimeter are.
4. Introduce to students the relationship between meter and centimeter, and the abbreviations of these units. Explain the differences between length and height too.
5. Using some big items such as windows and cupboards in the class, ask students to measure their lengths using standard measuring tools in meters.
6. Using some small items such as books and pencils in the class, ask students to measure their lengths using standard measuring tools in centimeters.
7. Guide students on how to compare different lengths. Which is longer? Which is shorter? You may compare the heights of two students.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Assignment / Task	Assessment Criteria	Learning Activities
1. Worksheet: Measuring Length in Meters and Centimeters	- Accurately identify the length or height of objects in meters, centimeters, or a combination of both as per the defined criteria.	- Measure the length or height of various objects and distances between two points. Measure along a given path in meters, centimeters, or both.
2. Worksheet: Estimating Length in Meters	- Estimate the length or height in meters accurately according to specified criteria.	- Estimate the length or height in meters by comparing with a reference length of 1 meter without using measuring tools.
3. Worksheet: Comparing Lengths Using the Relationship Between Meters and Centimeters	- Accurately compare the lengths of two objects in meters and centimeters according to the defined criteria.	- Compare lengths of two objects in meters and centimeters. If the meter values are equal, compare the centimeter values. When units differ, convert to the same unit before comparison.
4. Worksheet: Solving Word Problems Involving Lengths in	- Correctly show the solution steps for word problems involving lengths in meters	- Find the sum or difference of lengths given in meters and centimeters.

Assignment / Task	Assessment Criteria	Learning Activities
Meters and Centimeters	and centimeters as per the criteria.	

Assessment Components

1. Knowledge: A minimum score of 60 percent.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or higher.
3. Desirable Characteristics: Assessment result must be at Level 2 or higher.

Workpiece and Task Responsibilities

Assessment Criteria	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Measuring and stating length in meters and centimeters	The student can measure and state length in meters and cms. with 80% accuracy or above.	The student can measure and state length in meters and cms with 70%–79% accuracy.	The student can measure and state length in meters and cms. with 60%–69% accuracy.	The student can measure and state length in meters and cms. with less than 60% accuracy.
2. Estimating length in meters	The student can estimate length in meters with 80% accuracy or above.	The student can estimate length in meters with 70%–79% accuracy.	The student can estimate length in meters with 60%–69% accuracy.	The student can estimate length in meters with less than 60% accuracy.
3. Comparing lengths using the relationship between meters and centimeters	The student can compare lengths using the relationship between meters and centimeters with 80% accuracy or above.	The student can compare lengths using the relationship between meters and centimeters with 70%–79% accuracy.	The student can compare lengths using the relationship between meters and centimeters with 60%–69% accuracy.	The student can compare lengths using the relationship between meters and centimeters with less than 60% accuracy.
4. Showing methods to solve word problems involving length in meters and centimeters	The student can show methods to solve word problems involving length in meters and centimeters with 80% accuracy or above.	The student can show methods to solve word problems involving length in meters and centimeters with 70%–79% accuracy.	The student can show methods to solve word problems involving length in meters and centimeters with 60%–69% accuracy.	The student can show methods to solve word problems involving length in meters and centimeters with less than 60% accuracy.

Chapter 4

Mathematics (M12101)

Content: weight measurement

Time: 16 hours

Strand 2: Measurement and Geometry

Understanding the Basics of Measurement, Estimating and Measuring Quantities, and Applying Them in Real-Life Contexts

Indicators:

M2.1 P.2/4: Measure and compare weights using kilograms and grams, as well as kilograms and hectograms (100-gram units).

M2.1 P.2/5: Demonstrate methods for solving addition and subtraction word problems involving weight measurements in kilograms and grams, and kilograms and hectograms.

Learning Objective

Students will be taught to :

1. Measuring weight in kilograms and grams
2. Estimating weight in kilograms
3. Comparing weights using the relationship between kilograms and grams
4. Solving word problems involving weight measured in kilograms and grams

Learning Areas

The weight of objects can be expressed in grams (g), kilograms and hectograms, or kilograms and grams.

Weight unit relationships:

1 kilogram (kg) = 10 hectograms (hg)

1 hectogram (hg) = 100 grams (g)

1 kilogram (kg) = 1,000 grams (g)

When comparing weights in kilograms and grams or kilograms and hectograms, the object with a greater number of kilograms is heavier. If the kilograms are equal, the one with more grams or hectograms is heavier.

To compare weights with different units, convert them to the same unit before comparing.

To add or subtract weights measured in kilograms and grams or kilograms and hectograms, first convert all weights to the same unit and then perform the operation.

To solve word problems, follow these steps: Read and understand the problem. Plan how to solve it. Find the answer. Check the reasonableness of the result.

Teaching and Learning Activities

1. Guide students on how to add two 3-digit numbers.
2. Guide students to add three 3-digit numbers.
3. Guide students to find the unknown numbers in number sentences.
4. Using the word problem to guide students on how to solve it.
5. Write a number sentence involving addition on the board and ask students to create some word problems on it.
6. Guide students to subtract a number from a 3-digit number. Emphasize that subtraction must start with the ones, follow by the tens and lastly the hundreds.
7. Guide students to use addition to check the accuracy of answers from subtraction operations.
8. Guide students to find the unknown numbers in number sentences.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece / Task Responsibility

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on measuring and stating weight in kilograms and grams, and kilograms and hectograms	- Able to state the weight of various objects accurately according to the criteria	- State the weight of objects using units such as grams, kilograms and hectograms, or kilograms and grams
2. Worksheet on comparing weight using the relationship between kilograms and grams, and kilograms and hectograms	- Understand the relationship between units of weight - Compare weights in kilograms and grams, or kilograms and hectograms accurately according to the criteria - Compare weights with different units accurately according to the criteria	- Compare weights using kilograms and grams, or kilograms and hectograms. If the weight in kilograms is greater, it is heavier. If the kilograms are equal, the one with more grams or hectograms is heavier - When comparing weights with different units, convert them to the same unit before comparing

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
3. Worksheet on solving word problems involving weights in kilograms and grams, or kilograms and hectograms	- Solve word problems involving weights in kilograms and grams, or kilograms and hectograms accurately according to the criteria	- Solve addition or subtraction problems involving weight by converting the units to be the same before calculating

Assessment Components

1. Knowledge: A minimum score of 60 percent.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or higher.
3. Desirable Characteristics: Assessment result must be at Level 2 or higher.

Assessment Criteria

Assessment Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
1. Measuring and stating weight in kilograms and grams, or kilograms and hectograms	Students can measure and state weight in kilograms and grams, or in kilograms and hectograms with 80% accuracy or above	Students can measure and state weight in kilograms and grams, or in kilograms and hectograms with 70–79% accuracy	Students can measure and state weight in kilograms and grams, or in kilograms and hectograms with 60–69% accuracy	Students can measure and state weight in kilograms and grams, or in kilograms and hectograms with less than 60% accuracy
2. Comparing weight using the relationship between kilograms and grams, and kilograms and hectograms	Students can compare weights using the relationship between kilograms and grams, and kilograms and hectograms with 80% accuracy or above	Students can compare weights using the relationship between kilograms and grams, and kilograms and hectograms with 70–79% accuracy	Students can compare weights using the relationship between kilograms and grams, and kilograms and hectograms with 60–69% accuracy	Students can compare weights using the relationship between kilograms and grams, and kilograms and hectograms with less than 60% accuracy

Assessment Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
3. Showing methods to solve word problems involving weight in kilograms and grams, or kilograms and hectograms	Students can show methods to solve word problems involving weight in kilograms and grams, or kilograms and hectograms with 80% accuracy or above	Students can show methods to solve word problems involving weight in kilograms and grams, or kilograms and hectograms with 70–79% accuracy	Students can show methods to solve word problems involving weight in kilograms and grams, or kilograms and hectograms with 60–69% accuracy	Students can show methods to solve word problems involving weight in kilograms and grams, or kilograms and hectograms with less than 60% accuracy

Chapter 5

Mathematics (M12101)

Content: Multiplication

Time: 25 hours

Strand 1: Numbers and Operations

Standard M1.1: Understanding of diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr2/5 Find the value of the unknown in the multiplication symbol sentence of a number of 1 digit by a number of up to 2 digits.

M1.1 Gr2/8 Shows how to find the answer to the 2-step problem of numbers up to 1000 and 0.

Learning Objective

Students will be taught to :

1. Understand multiplication as repeated addition.
2. Solve word problems involving multiplication of 1-digit numbers.
3. Understand and use the operations of multiplication
4. Solve word problems involving multiplication of 1-digit numbers by 2digit numbers

Learning Outcomes

Students will be able to:

1. Recognize multiplication as repeated addition.
2. Read and write number sentences for multiplication.
3. Build up multiplication tables for 2 to 9.
4. Multiply two numbers.
5. Know the properties of multiplication.
6. Solve word problems involving multiplication of 1-digit numbers.
7. Multiply 1-digit numbers by 10, 20, ..., 90.
8. Multiply 1-digit numbers by 2-digit numbers without regrouping and with regrouping.
9. Solve word problems involving the multiplication of 1-digit numbers by 2-digit numbers

Learning Areas

1. Meaning of multiplication
2. Multiplication of 1-digit numbers
3. Solving word problems involving the multiplication of 1-digit numbers
4. Multiplication of 1-digit numbers by 10, 20, ..., 90
5. Multiplication of 1-digit numbers by 2-digit numbers
6. Solving word problems involving the multiplication of 1-digit numbers by 2-digit numbers

Teaching and Learning Activities

1. Explain the meaning of multiplication as repeated addition.
2. Guide them how to write and read number sentences for multiplication.
3. Guide students to build their own multiplication tables of 1 to 5, using items or pictorial representation.
4. Help students to recall rapidly the multiplication tables by saying aloud and using flash cards. This need to be done daily until they are familiar with the tables.
5. Randomly pick a few students to recall the multiplication tables quickly and smoothly.
6. Guide them to write number sentences using the standard written method.
7. Then, continue to introduce multiplication tables of 6 to 9.
8. Ensure students can recall rapidly all the multiplication tables of 2 to 9.
9. Explain the properties of multiplication such as commutative property, multiplication by one and multiplication by zero.
10. When solving word problems, always ask students to understand the problems and write the number sentences.
11. Show students the relation between multiplying 3 with 2 and 3 with 20.
12. Guide students to do multiplication without regrouping, using the standard written method.
13. Explain to students how to solve it. Reiterate the importance of writing the number sentence before solving it.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Learning Task / Assignment	Assessment Criteria	Learning Activities
1. Worksheet on the Meaning of Multiplication	- Able to correctly represent multiplication in symbolic form according to the specified criteria. - Able to correctly express multiplication as repeated addition according to the specified criteria.	- Preparatory activities and pre-test. - Study the meaning of multiplication and practice repeated addition.
2. Worksheet on Multiplying a One-Digit Number by a One-Digit Number	Able to correctly find the product in a multiplication sentence involving a one-digit number multiplied by another one-digit number, according to the specified criteria.	- Study how to multiply a one-digit number by 0 and by 1. - Practice finding the product in multiplication sentences involving one-digit numbers.
3. Worksheet on Multiplying a One-Digit Number by a Number Not Exceeding Two Digits	- Able to correctly find the product in a multiplication sentence involving a one-digit number and a number not exceeding two digits, according to the specified criteria.	- Study how to multiply a one-digit number by a two-digit number using vertical multiplication. - Multiply the units digit first, then the tens digit. - If the product is ten or more, carry over to the next place value.
4. Worksheet on Finding the Unknown in Multiplication Sentences	- Able to correctly find the unknown in a multiplication sentence involving a one-digit number and a number not exceeding two digits, according to the specified criteria.	- Study how to find the unknown in multiplication sentences. - Use multiplication facts (times tables) to find the missing value.
5. Worksheet on Solving Word Problems Involving Multiplication	- Able to show the correct method of solving multiplication word problems according to the specified criteria.	- Solve problems by reading and understanding the problem, planning a solution, finding the answer, and checking its reasonableness. - When creating word problems, include both given and asked information, and ensure the problem is realistic.

Chapter 6**Mathematics (M12101)****Content: Division****Time: 25 hours**

Strand 1: Numbers and Operations

Standard M1.1: Understanding of diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr2/6 Find the value of the unknown in the division symbol sentence with no more than 2-digit divisor and 1-digit divisor where the quotient

M1.1 Gr2/8 Shows how to find the answer to the 2-step problem of numbers up to 1000 and 0.

Learning Objective

Students will be taught to :

1. Understand division as sharing equally or grouping.
2. Solve word problems involving division.
3. Understand and use the operation of multiplications.

Learning Outcomes

Students will be able to:

1. Recognize multiplication as sharing equally or grouping.
2. Read and write number sentences for division.
3. Recognize division as the opposite of multiplication.
4. Divide by 1-digit divisors.
5. Identify exact division.
6. Solve word problems involving division.

Learning Areas

1. Meaning of division
2. Division as the opposite of multiplication
3. Dividing by 1-digit divisors
4. Exact division
5. Solving word problems involving division

Teaching and Learning Activities

1. Explain division as equal sharing or grouping.
2. Emphasize that division means equal sharing or grouping.
3. Guide them on how to write and read number sentences involving division. Label the number sentences.
4. Tell students that division is the opposite of multiplication. Write a few number sentences involving division. Ask a few students to rewrite them involving multiplication.
5. To divide easily, we need to remember the multiplication tables very well.
6. Explain the differences between exact division and division with a remainder to students.
7. Explain to students how to solve it. Reiterate the importance of writing the number sentence before solving it.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria	Learning Activities
1. Worksheet on the Meaning of Division	- Able to explain the meaning of division correctly according to the specified criteria	- Learn and explore the concept of division through real-life examples and discussions
2. Worksheet on Finding Quotients and Remainders	- Able to find quotients and remainders accurately as per the assessment criteria	- Study how to divide numbers and identify the quotient and remainder through guided practice
3. Worksheet on the Relationship Between Multiplication and Division	- Able to identify the relationship between multiplication and division correctly	- Learn how multiplication and division are related using visual aids, fact families, and math sentence matching
4. Worksheet on Solving Division Word Problems	- Able to solve division word problems accurately according to the criteria	- Learn to analyze division word problems, write number sentences, show step-by-step solutions, and consider the reasonableness of the answer

Workpiece / Task Responsibility	Assessment Criteria	Learning Activities
5. Worksheet on Creating Division Word Problems	- Able to create division word problems correctly based on the criteria	- Learn how to create division word problems by writing number sentences, showing the solution process, and checking for reasonableness of the answer

Assessment Components

1. A minimum score of 60 percent.
2. Assessment result must be at Level 2 or higher.
3. Assessment result must be at Level 2 or higher.

Assessment Criteria

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Understanding the Meaning of Division	student can explain the meaning of division with 80% accuracy or higher.	Student can explain the meaning of division with 70%–79% accuracy.	Student can explain the meaning of division with 60%–69% accuracy.	Student can explain the meaning of division with less than 60% accuracy.
2. Finding Quotients and Remainders	Student can find quotients and remainders with 80% accuracy or higher	Student can find quotients and remainders with 70%–79% accuracy	Student can find quotients and remainders with 60%–69% accuracy	Student can find quotients and remainders with less than 60% accuracy
3. Identifying the Relationship Between Multiplication and Division	Student can identify the relationship between multiplication and division with 80% accuracy or higher	Student can identify the relationship between multiplication and division with 70%–79% accuracy	Student can identify the relationship between multiplication and division with 60%–69% accuracy	Student can identify the relationship between multiplication and division with less than 60% accuracy

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
4. Solving Division Word Problems	Student can solve division word problems with 80% accuracy or higher	Student can solve division word problems with 70%–79% accuracy	Student can solve division word problems with 60%–69% accuracy	Student can solve division word problems with less than 60% accuracy
5. Creating Division Word Problems	Student can create division word problems with 80% accuracy or higher	Student can create division word problems with 70%–79% accuracy	Student can create division word problems with 60%–69% accuracy	Student can create division word problems with less than 60% accuracy

Chapter 7

Mathematics (M12101)

Content: Time

Time: 20 hours

Strand 2: Measurement

Standard M2.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Grade level indicators

M2.1 Gr2/1 Tell length in metres and centimetres, and compare length by using the same unit.

Learning Objective

Students will be taught to :

1. Understand, read and write the time.
2. Understand the units of time.

Learning Outcomes

Students will be able to:

1. Read and write the time to an hour
2. Read and write the time to five minutes.
3. Know the relationship between day, hour, minute, day, months and year.
4. Relate time to calendar.
5. Read calendar.

Learning Areas

- Reading and writing the time
- Reading and writing the time in hours and minutes
- 1 hour = 60 minutes; 1 day = 24 hours
- Months of the year
- Calendar

Teaching and Learning Activities

1. Using an analog clock, ask students to identify the minute hand, hour hand and second hand. Emphasize the difference between the hour hand and the minute hand.

2. Guide students to read the time in hours from analog clocks and digital clocks.

3. Explain the minutes on the clocks and the relationship between hours and minutes.

Emphasize that each small mark on the clock represents a minute.

4. Guide students to read the time to the five minutes intervals. Introduce a few ways to read the time such as 'forty-five minutes past ten', 'ten forty five', 'a quarter to eleven', 'half past five' and 'fifteen minutes to eleven'.

5. Guide them to write the time too. It can be in numerals or in letters. Check on the spelling.
6. Emphasize that an hour has 60 minutes. When the minute hand moved round the clock once, the hour hand moves to the next number.
7. Emphasize that in a day there are 24 hours. The hour hand moves round the clock 2 times.
8. Guide students to read and spell the months of a year.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Assessment Criteria	Learning Activities	Learning Task / Activity
1. Worksheet: Reading a Calendar	- Able to read a calendar correctly according to the given criteria	- Learn how to read and interpret a calendar
2. Worksheet: Telling Time to the Nearest 5 Minutes	- Able to tell time to the nearest 5 minutes accurately	- Practice telling time using clock models and real-life situations (5-minute intervals)
3. Task: Telling Duration in Hours and Minutes	- Able to tell duration in hours and minutes correctly	- Learn to calculate and express the length of time in hours and minutes
4. Comparing Duration in Hours and Minutes	- Able to compare time durations correctly in hours and minutes	- Practice comparing time intervals using charts or number lines
5. Solving Word Problems Involving Time	- Able to solve time-related word problems accurately	- Analyze and solve real-life time problems using logical reasoning and appropriate methods

Assessment Components

1. Knowledge: A minimum score of 60 percent.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or higher.
3. Desirable Characteristics: Assessment result must be at Level 2 or higher.

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria	Learning Activities
1. Worksheet on the Concept of Division	- Accurately explain the meaning of division according to the specified criteria.	- Learn and understand the concept of division.
2. Worksheet on Finding Quotients and Remainders	- Accurately find the quotient and remainder of given numbers according to the specified criteria.	- Learn how to calculate the quotient and remainder of a division problem.
3. Worksheet on the Relationship Between Multiplication and Division	- Accurately explain the relationship between multiplication and division according to the specified criteria.	- Learn and explore the relationship between multiplication and division.
4. Worksheet on Solving Division Word Problems	- Accurately solve division word problems according to the specified criteria.	- Learn to analyze division word problems, write division number sentences, show the method used to solve, and evaluate the reasonableness of the answer.
5. Worksheet on Creating Division Word Problems	- Correctly create division word problems according to the specified criteria.	- Learn to create division word problems, write them as division number sentences, show the solving method, and evaluate the reasonableness of the answer.

Assessment Components

1. A minimum score of 60 percent.
2. Assessment result must be at Level 2 or higher.
3. Assessment result must be at Level 2 or higher.

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Reading a Calendar	The student can read a calendar with 80% accuracy or higher	The student can read a calendar with 70%–79% accuracy	The student can read a calendar with 60%–69% accuracy	The student can read a calendar with less than 60% accuracy
2. Telling Time to the Nearest 5 Minutes	The student can tell time to the nearest 5 minutes with 80% accuracy or higher	The student can tell time to the nearest 5 minutes with 70%–79% accuracy	The student can tell time to the nearest 5 minutes with 60%–69% accuracy	The student can express time duration in hours and minutes with less than 60% accuracy
3. Telling Duration in Hours and Minutes	The student can express time duration in hours and minutes with 80% accuracy or higher	The student can express time duration in hours and minutes with 70%–79% accuracy	The student can express time duration in hours and minutes with 60%–69% accuracy	The student can express time duration in hours and minutes with less than 60% accuracy
4. Comparing Duration in Hours and Minutes	The student can compare time durations in hours and minutes with 80% accuracy or higher	The student can compare time durations in hours and minutes with 70%–79% accuracy	The student can compare time durations in hours and minutes with 60%–69% accuracy	The student can compare time durations in hours and minutes with less than 60% accuracy
5. Solving Time-related Word Problems	The student can solve time-related word problems with 80% accuracy or higher	The student can solve time-related word problems with 70%–79% accuracy	The student can solve time-related word problems with 60%–69% accuracy	The student can solve time-related word problems with less than 60% accuracy

Chapter 8

Mathematics (M12101)

Content: Volume measurement

Time: 15 hours

Strand 2: Measurement

Standard M2.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Grade level indicators

M2.1 Gr2/6 Tell the days, months and year from a calendar.

Learning Objective

Students will be taught to :

1. Measure and compare volume in liters.
2. Measure and compare capacity in liters.
3. Solve word problems involving volume and capacity.

Learning Outcomes

Students will be able to:

1. Read scales to the nearest division.
2. Measure and record volumes in liter.
3. Compare volumes of two liquids in liters.
4. Measure and record capacity in liters.
5. Compare capacity of two containers in liters.
6. Solve word problems involving volume and capacity.

Learning Areas

- Measuring volume in liters
- Measuring capacity in liters
- Solving word problems involving volume and capacity

Teaching and Learning Activities

1. Briefly explain what volume is.
2. Show students some standard measuring tools such as measuring spoons, measuring cups, measuring cylinders and beakers.
3. Introduce the unit liter and its abbreviation. Show them how much a liter of water is.
4. Using some containers such as jugs and bowls, ask students to measure their volumes using standard measuring tools in liters.
5. Explain to students the differences between volume and capacity.
6. Guide students to solve them.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria	Learning Activities
1. Worksheet on Measuring Volume and Capacity Using Non-standard Units	- Able to measure volume and capacity using non-standard units correctly according to the given criteria	- Learn and experiment by measuring the volume and capacity of various items using non-standard units
2. Worksheet on Measuring Volume and Capacity in Teaspoons, Tablespoons, Measuring Cups, and Liters	- Able to measure volume and capacity in teaspoons, tablespoons, measuring cups, and liters correctly	- Hands-on activity measuring items using standard units such as teaspoons, tablespoons, measuring cups, and liters
3. Worksheet on Comparing Volume and Capacity Using Standard Units	- Able to compare volume and capacity in teaspoons, tablespoons, measuring cups, and liters correctly	- Practice comparing the volume and capacity of different items using standard measurement units
4. Worksheet on Solving Word Problems Involving Volume and Capacity	Worksheet on Solving Word Problems Involving Volume and Capacity	- Able to solve volume and capacity problems involving teaspoons, tablespoons, measuring cups, and liters correctly

Assessment Components

1. A minimum score of 60 percent.
2. Assessment result must be at Level 2 or higher.
3. Assessment result must be at Level 2 or higher.

Assessment Criteria

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Measuring Volume and Capacity Using Non-standard Units	Student can measure volume and capacity using non-standard units with 80% accuracy or higher	Student can measure volume and capacity using non-standard units with 70%–79% accuracy	Student can measure volume and capacity using non-standard units with 60%–69% accuracy	Student can measure volume and capacity using non-standard units with less than 60% accuracy
2. Measuring Volume and Capacity in Teaspoons, Tablespoons, Measuring Cups, and Liters	Student can measure using standard units with 80% accuracy or higher	Student can measure using standard units with 70%–79% accuracy	Student can measure using standard units with 60%–69% accuracy	Student can measure using standard units with less than 60% accuracy
3. Comparing Volume and Capacity in Standard Units	Student can compare volume and capacity with 80% accuracy or higher	Student can compare volume and capacity with 70%–79% accuracy	Student can compare volume and capacity with 60%–69% accuracy	Student can compare volume and capacity with less than 60% accuracy
4. Solving Word Problems Involving Volume and Capacity	Student can solve word problems with 80% accuracy or higher	Student can solve word problems with 70%–79% accuracy	Student can solve word problems with 60%–69% accuracy	Student can solve word problems with less than 60% accuracy

Chapter 9**Mathematics (M12101)****Content: Geometric figure****Time: 8 hours**

Strand 2: Measurement

Standard M2.2: Solving measurement problems

Grade level indicators

M2.1 Gr2/1 Tell length in metres and centimetres, and compare length by using the same unit.

Learning Objective

Students will be taught to :

1. Understand and use terms related to 2-D and 3-D shapes.
2. Understand the shape patterns.

Learning Outcomes

Students will be able to:

1. Identifying 2-D and 3-D shapes.
2. Label the parts of 2-D and 3-D shapes.
3. Identify shape patterns.
4. Form shape patterns.

Learning Areas

- Two-dimensional (2-D) shapes
- Three-dimensional (3-D) shapes
- Shape patterns

Teaching and Learning Activities

1. Refresh students' memory of 2-D shapes such as triangles, rectangles, squares, circles and ovals.
2. Draw a few 2-D shapes and ask students to identify them.
3. Name a few 2-D shapes and ask students to draw them on the board.
4. Show and introduce to students 3-D shapes using models such as cubes, cuboids, pyramids, cones, spheres and cylinders.
5. Ask them to give examples of things in our daily life that have 3-D shapes.
6. Introduce the parts of a 3-D shape such as the face, edge and corner.
7. Draw alternate squares and triangles. Guide students to identify the pattern.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Assessment Components

1. A minimum score of 60 percent.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or higher.
3. Desirable Characteristics: Assessment result must be at Level 2 or higher.

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria	Learning Activities
1. Worksheet on Polygons	Able to classify and describe the characteristics of polygons correctly according to the given criteria	- Learn the properties and classification of different types of polygons through discussion and activities
2. Worksheet on Circles and Ovals	- Able to classify and describe the characteristics of circles and ovals correctly	- Study the features of circles and ovals and practice identifying and classifying them through observation and comparison
3. Worksheet on Drawing 2D Geometric Shapes Using Shape Templates	- Able to draw 2D geometric shapes using templates correctly according to the criteria	- Learn how to draw 2D shapes by using shape templates and tracing activities
4. Worksheet on Repeating Patterns Using Geometric and Other Shapes	- Able to create repeating patterns with geometric and other shapes correctly according to the criteria	- Able to create repeating patterns with geometric and other shapes correctly according to the criteria

Assessment Components

1. A minimum score of 60 percent.
2. Assessment result must be at Level 2 or higher.
3. Assessment result must be at Level 2 or higher.

Assessment Criteria

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Classification and Description of Polygons	The student accurately classifies and describes the properties of polygons with a score of 80% or higher.	The student classifies and describes polygon properties with a score between 70% and 79%.	The student classifies and describes polygon properties with a score between 60% and 69%.	The student classifies and describes polygon properties with a score lower than 60%.
2. Classification and Description of Circles and Ovals	The student accurately classifies and describes the characteristics of circles and ovals with a score of 80% or higher.	The student classifies and describes the characteristics of circles and ovals with a score between 70% and 79%.	The student classifies and describes the characteristics of circles and ovals with a score between 60% and 69%.	The student classifies and describes the characteristics of circles and ovals with a score lower than 60%.
3. Construction of 2D Geometric Figures Using Shape Models	The student accurately draws 2D geometric shapes using provided templates or models with a score of 80% or higher.	The student draws 2D geometric shapes using templates with a score between 70% and 79%.	The student draws 2D geometric shapes using templates with a score between 60% and 69%.	The student draws 2D geometric shapes using templates with a score lower than 60%.
4. Creation of Repeating Patterns Using Geometric and Non-Geometric Shapes	The student correctly creates repeating patterns using geometric and other shapes with a score of 80% or higher.	The student creates repeating patterns using geometric and other shapes with a score between 70% and 79%.	The student creates repeating patterns using geometric and other shapes with a score between 60% and 69%.	The student creates repeating patterns using geometric and other shapes with a score lower than 60%.

Chapter 10**Mathematics (M12101)****Content: Addition, subtraction, multiplication, division****Time: 24 hours**

Strand 1: Numbers and Operations

Standard M1.1: Understanding of diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr2/7 Find the results of adding, subtracting, multiplying, and dividing a number of numbers up to 1,000 and 0.

M1.1 Gr2/8 Shows how to find the answer to the 2-step problem of numbers up to 1000 and 0.

Learning Objective

Students will be taught to :

1. Perform addition of numbers within 1,000.
2. Perform computations involving addition to solve word problems.
3. Perform subtraction of numbers within 1,000.
4. Perform computations involving addition and subtraction to solve word problems.

Learning Outcomes

Students will be able to:

1. Add up two 3-digit numbers.
2. Add up three 3-digit numbers.
3. Solve problems involving addition.
4. Subtract a number from a 3-digit number.
5. Use addition to check accuracy of answers from subtraction operations.
6. Solve problems involving subtraction

Learning Areas

- Addition within 1,000
- Using addition to solve word problems
- Subtraction within 1,000
- Using subtraction to solve word problems

Teaching and Learning Activities

1. Guide students on how to add two 3-digit numbers.
2. Guide students to add three 3-digit numbers.
3. Guide students to find the unknown numbers in number sentences.
4. Using the word problem to guide students on how to solve it.
5. Write a number sentence involving addition on the board and ask students to create some word problems on it.
6. Guide students to subtract a number from a 3-digit number. Emphasize that subtraction must start with the ones, follow by the tens and lastly the hundreds.
7. Guide students to use addition to check the accuracy of answers from subtraction operations.
8. Guide students to find the unknown numbers in number sentences.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria	Learning Activities
1. Worksheet on Mixed Operations of Whole Numbers (not exceeding 1,000 and 0)	- Accurately finds the results of mixed operations involving addition, subtraction, multiplication, and division of whole numbers (up to 1,000 and 0), in accordance with the specified criteria	- Explore and discuss as a class to find the results of mixed operations involving whole numbers not exceeding 1,000 and 0
2. Worksheet on Solving Word Problems Involving Mixed Operations	- Correctly solves and finds answers to word problems involving mixed operations according to the specified criteria	- Collaboratively analyze word problems involving mixed operations and show step-by-step solutions while reflecting on the reasonableness of the results
3. Worksheet on Creating Word Problems Involving Mixed Operations	- Accurately creates and solves mixed-operation word problems according to the assessment criteria	- Learn how to construct word problems involving mixed operations, write mathematical expressions, and show step-by-step solutions while considering the reasonableness of the answers

Assessment Components

- 1 .Knowledge: A minimum score of 60 percent.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or higher.
3. Desirable Characteristics: Assessment result must be at Level 2 or higher.

Assessment Criteria

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Performing Mixed Operations	The student accurately computes mixed operations addition, subtraction, multiplication, and division) with a score of 80% or above.	The student computes mixed operations with a score between 70% and 79%.	The student computes mixed operations with a score between 60% and 69%.	The student computes mixed operations with a score below 60%.
2. Solving Word Problems Involving Mixed Operations	The student accurately solves word problems involving mixed operations with a score of 80% or above.	The student solves word problems with a score between 70% and 79%.	The student solves word problems with a score between 60% and 69%.	The student solves word problems with a score below 60%.
3. Creating Word Problems Involving Mixed Operations	The student successfully constructs word problems involving mixed operations and solves them with a score of 80% or above.	The student constructs and solves problems with a score between 70% and 79%.	The student constructs and solves problems with a score between 60% and 69%.	The student constructs and solves problems with a score below 60%.

Chapter 11**Mathematics (M12101)****Content: Geometry****Time: 8 hours**

Strand 3: Geometry

Standard M3.1: Ability to explain and analyse two-dimensional and three-dimensional geometric figures

Grade level indicators

M3.1 Gr2/1 Identify two-dimensional geometric figures whether in the form of triangles,

Learning Objective

Students will be taught to :

1. Understand and use terms related to 2-D and 3-D shapes.
2. Understand the shape patterns.

Learning Outcomes

Students will be able to:

1. Identifying 2-D and 3-D shapes.
2. Label the parts of 2-D and 3-D shapes.
3. Identify shape patterns.
4. Form shape patterns.

Learning Areas

- Two-dimensional (2-D) shapes
- Three-dimensional (3-D) shapes
- Shape patterns

Teaching and Learning Activities

1. Refresh students' memory of 2-D shapes such as triangles, rectangles, squares, circles and ovals.
2. Draw a few 2-D shapes and ask students to identify them.
3. Name a few 2-D shapes and ask students to draw them on the board.
4. Show and introduce to students 3-D shapes using models such as cubes, cuboids, pyramids, cones, spheres and cylinders.
5. Ask them to give examples of things in our daily life that have 3-D shapes.
6. Introduce the parts of a 3-D shape such as the face, edge and corner.
7. Draw alternate squares and triangles. Guide students to identify the pattern.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria	Learning Activities
1. Worksheet on Reading Pictographs where 1 symbol represents 2 units	- Able to interpret pictographs in which 1 image represents 2 units accurately and in accordance with the specified criteria	- Study and practice reading pictographs where each symbol represents 2 units
2. Worksheet on Reading Pictographs where 1 symbol represents 5 units	- Able to interpret pictographs in which 1 image represents 5 units accurately and in accordance with the specified criteria	- Study and practice reading pictographs where each symbol represents 5 units
3. Worksheet on Creating Word Problems Involving Mixed Operations	- Able to interpret pictographs in which 1 image represents 10 units accurately and in accordance with the specified criteria	- Study and practice reading pictographs where each symbol represents 10 units

Assessment Components

1. Knowledge: A minimum score of 60 percent.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or higher.
3. Desirable Characteristics: Assessment result must be at Level 2 or higher.

Assessment Criteria

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Reading pictographs where 1 symbol represents 2 units	The student can accurately interpret pictographs with 1 symbol representing 2	The student can interpret pictographs with 1 symbol representing 2 units at 70% – 79%.	The student can interpret pictographs with 1 symbol representing 2 units at 60% – 69%.	The student can interpret pictographs with 1 symbol representing 2 units below 60%.

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	units at 80% or higher.			
2. Solving Word Problems Involving Mixed Operations	The student can accurately interpret pictographs with 1 symbol representing 5 units at 80% or higher.	The student can interpret pictographs with 1 symbol representing 5 units at 70% – 79%.	The student can interpret pictographs with 1 symbol representing 5 units at 60% – 69%.	The student can interpret pictographs with 1 symbol representing 5 units below 60%.
3. Creating Word Problems Involving Mixed Operations	The student can accurately interpret pictographs with 1 symbol representing 10 units at 80% or higher.	The student can interpret pictographs with 1 symbol representing 10 units at 70% – 79%.	The student can interpret pictographs with 1 symbol representing 10 units at 60% – 69%.	The student can interpret pictographs with 1 symbol representing 10 units below 60%.

Grade 3 Unit Design Framework

Chapter 1

Mathematics (M13101)

Content: cardinal numbers not exceeding 100,000

Time: 14 hours

Strand 1: Numbers and Algebra

Standard M 1.1: Understand the variety of number representations, number systems, number operations, their results, properties of operations, and applications.

Standard M 1.2: Understand and analyze patterns, relationships, functions, sequences, and series, and apply this knowledge.

Grade level indicators

- **M 1.1 Gr.3/1:** Read and write Hindu-Arabic numerals, Thai numerals, and number words for counting numbers not exceeding 100,000 and zero.
- **M 1.1 Gr.3/2:** Compare and order counting numbers not exceeding 100,000 in various situations.
- **M 1.2 Gr.3/1:** Identify missing numbers in increasing or decreasing number patterns with equal intervals.

Learning Content:

1. Reading and writing Hindu-Arabic numerals, Thai numerals, and number words.
2. Place value and value of digits in each place, including expanded form.
3. Comparing and ordering numbers.
4. Patterns of numbers that increase or decrease by a constant value.

Core Concepts:

Reading counting numbers not exceeding 100,000 is based on place value, read from left to right. Numbers can be written in Hindu-Arabic numerals, Thai numerals, or words, and may include four-digit, five-digit, or six-digit numbers with units, tens, hundreds, thousands, ten-thousands, and hundred-thousands places. Writing numbers in expanded form involves expressing the number as a sum of the values of its digits according to place value.

Comparing two numbers uses the terms **equal to**, **greater than**, and **less than**, represented by the symbols $=$, $>$, and $<$. Ordering numbers can be done by identifying the greatest or smallest number first, then arranging the numbers from greatest to least or least to greatest.

Number patterns that increase or decrease by a constant value are sequences where each number relates to the next by adding or subtracting the same amount.

Key Competencies of Learners:

- Life skills
- Thinking skills

Desirable Characteristics:

- Love of learning
- Determination and perseverance in work

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1.Worksheet: Reading and Writing Hindu-Arabic Numerals, Thai Numerals, and Number Words Representing Quantities or Counting Numbers Not Exceeding 100,000 and Zero	- Accurately read and write Hindu-Arabic numerals, Thai numerals, and number words.	- Study, learn, and practice reading and writing Hindu-Arabic numerals, Thai numerals, and number words representing quantities or counting numbers not exceeding 100,000 and zero by using a hundred chart or an abacus, and arranging the beads to represent various numbers.
2.Worksheet: Comparing and Ordering Numbers	- Correctly use place value and digit values, including the use of zero to hold place positions. - Accurately write numbers in expanded form. - Correctly compare numbers and use the symbols =, $\neq$, $>$, and $<$ appropriately. - Correctly order up to five numbers.	- Study and learn from lesson materials on comparing and ordering numbers, and practice accordingly.
3. Worksheet: Describing Quantities and Relationships in Number Patterns Increasing by 3, 4, 25, and 50, and Decreasing by 3, 4, 25, and 50, Including Repeating Patterns	- Accurately describe the quantities and relationships in number patterns that increase by 3, 4, 25, and 50, decrease by 3, 4, 25, and 50, and in repeating patterns.	- Study, learn, and practice describing quantities and relationships in number patterns that increase by 3, 4, 25, and 50; decrease by 3, 4, 25, and 50; and in repeating patterns.

Assessment Includes:

Knowledge: Achieve a score of 60% or higher.

Mathematical Skills and Processes: Achieve an evaluation level of 2 or higher.

Desirable Characteristics: Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
1. Reading and writing Hindu-Arabic numerals, Thai numerals, and number words	Students can read and write Hindu-Arabic numerals, Thai numerals, and number words with 80% or higher accuracy.	Students can read and write Hindu-Arabic numerals, Thai numerals, and number words with 70% - 79% accuracy.	Students can read and write Hindu-Arabic numerals, Thai numerals, and number words with 60% - 69% accuracy.	Students can read and write Hindu-Arabic numerals, Thai numerals, and number words with less than 60% accuracy.
2. Use of place value and digit values in each place, and writing numbers in expanded form	Students can correctly use place value and digit values and write numbers in expanded form with 80% or higher accuracy.	Students can correctly use place value and digit values and write numbers in expanded form with 70% - 79% accuracy.	Students can correctly use place value and digit values and write numbers in expanded form with 60% - 69% accuracy.	Students can correctly use place value and digit values and write numbers in expanded form with less than 60% accuracy.
3. Comparing numbers and using the symbols =, ≠, >, <	Students can compare numbers and use the symbols =, ≠, >, < with 80% or higher accuracy.	Students can compare numbers and use the symbols =, ≠, >, < with 70% - 79% accuracy.	Students can compare numbers and use the symbols =, ≠, >, < with 60% - 69% accuracy.	Students can compare numbers and use the symbols =, ≠, >, < with less than 60% accuracy.
4. Describing quantities and relationships in number patterns	Students can describe quantities and relationships in	Students can describe quantities and relationships in	Students can describe quantities and relationships in	Students can describe quantities and relationships in

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
that increase or decrease by equal intervals	number patterns that increase or decrease by equal intervals with 80% or higher accuracy.	number patterns that increase or decrease by equal intervals with 70% - 79% accuracy.	number patterns that increase or decrease by equal intervals with 60% - 69% accuracy.	number patterns that increase or decrease by equal intervals with less than 60% accuracy.

Chapter 2

Mathematics (M13101)

Content: Addition and subtraction of natural numbers not exceeding 100,000 **Time: 20 hours**

Strand 1: Numbers and Algebra

Standard M 1.1 Understand the diversity of number representations, number systems, number operations, their results, properties of operations, and their applications.

Grade level indicators

M 1.1 Gr.3/5: Find the value of an unknown number in addition and subtraction equations involving natural numbers not exceeding 100,000 and 0.

M 1.1 Gr.3/8: Find the result of mixed operations (addition, subtraction, multiplication, and division) of natural numbers not exceeding 100,000 and 0.

M 1.1 Gr.3/9: Show methods for solving two-step word problems involving natural numbers not exceeding 100,000 and 0.

Learning Content

- Addition and subtraction
- Multiplication and both long and short division
- Mixed operations (addition, subtraction, multiplication, division)
- Solving and creating word problems, along with finding solutions

Core Concepts

- Finding the sum of two numbers with and without carrying.
- Finding the difference between two numbers with and without borrowing.
- Determining the value of an unknown in equations using the relationship between addition and subtraction.
- Solving word problems by reading and understanding the problem, planning the solution, finding the answer, and verifying the reasonableness of the result.
- Creating word problems must include both given information and the question part, and the created problems must be realistic.

Desirable Characteristics

- Discipline
- Determination in work

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1. Worksheet: Addition and Subtraction of Natural Numbers Not Exceeding 100,000	- Perform addition and subtraction of natural numbers not exceeding 100,000 accurately.	- Study, learn, and practice addition and subtraction through example charts, demonstrations using abacus, and various methods.
2. Worksheet: Word Problems – Addition	- Solve addition word problems correctly.	- Collaboratively analyze addition word problems and show step-by-step solutions to find the correct answers.
3. Worksheet: Word Problems – Subtraction	- Solve subtraction word problems correctly.	- Collaboratively analyze subtraction word problems and show step-by-step solutions to find the correct answers.
4. Worksheet: Creating Word Problems – Addition and Subtraction	- Create accurate word problems involving addition and subtraction.	- Practice creating addition and subtraction word problems using group work and problem-solving processes.

Assessment Includes:

1. Knowledge: Achieve a score of 60% or higher.
2. Mathematical Skills and Processes: Achieve an evaluation level of 2 or higher.
3. Desirable Characteristics: Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
1. Finding the Value of Unknowns in Addition and Subtraction Equations with Natural Numbers	The student can correctly find the value of unknowns in addition and subtraction equations	The student can find the value of unknowns in such equations with 70–79% accuracy.	The student can find the value of unknowns in such equations with 60–69% accuracy.	The student can find the value of unknowns in such equations with less than 60% accuracy.

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
up to 100,000 and 0	involving natural numbers up to 100,000 and 0 with 80% or higher accuracy.			
2. Solving Addition and Subtraction of Natural Numbers up to 100,000 and 0	The student can correctly calculate addition and subtraction of natural numbers up to 100,000 and 0 with 80% or higher accuracy.	The student can perform such calculations with 70–79% accuracy.	The student can perform such calculations with 60–69% accuracy.	The student performs such calculations with less than 60% accuracy.
3. Showing Steps to Solve Word Problems Involving Natural Numbers up to 100,000 and 0	The student can clearly demonstrate the solution process for word problems involving natural numbers up to 100,000 and 0 with 80% or higher accuracy.	The student demonstrates the solution process with 70–79% accuracy.	The student demonstrates the solution process with 60–69% accuracy.	The student demonstrates the solution process with less than 60% accuracy.

Chapter 3

Mathematics (M13101)

Content: Time

Time: 15 hours

Strand 2: Measurement

Standard M2.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Grade level indicators

M2.1 Gr3/2 Write the solution to solve word problems about the time and the duration of the time

Learning Content

- Telling time in hours and minutes
- Writing and reading time using a period (.) or a colon (:))
- Telling durations in hours and minutes
- Comparing durations using the relationship between hours and minutes
- Reading and writing schedules or activities with specified times
- Solving word problems related to time and duration
-

Core Concepts / Key Ideas

- Telling time in hours and minutes
- Expressing and interpreting time using a period (e.g., 10.30) or a colon (e.g., 10:30)
- Comparing durations given in hours and minutes
- Comparing durations with different time units
- Recording activities with specific times
- Solving word problems involving time and duration
-

Key Competencies of Learners

- Communication skills
- Thinking skills
-

Desirable Characteristics

- Honesty and integrity
- Eagerness to learn

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1. Worksheet: Telling Time on the Hour	- Accurately tell time to the hour.	- Study, discuss, and practice telling time to the hour together.
2. Telling Time in Hours and Minutes	- Accurately tell time in hours and minutes.	- Study, discuss, and practice telling time in hours and minutes collaboratively.
3. Worksheet: Expressing Duration in Hours and Minutes	- Accurately express durations in hours and minutes using proper mathematical language and symbols.	- Study, discuss, and practice expressing duration in hours and minutes.
4. Worksheet: Telling Time Using Digital Clocks	- Accurately tell time using digital clocks.	- Study, discuss, and practice telling time using digital clocks.
5. Worksheet: Comparing Durations Using Hour–Minute Relationships	- Accurately compare durations by applying the relationship between hours and minutes.	- Study, discuss, and practice comparing durations using the relationship between hours and minutes.
6. Worksheet: Reading and Writing Time-Based Activity Records	- Accurately read and write records of activities with specified time	- Study, discuss, and practice reading and writing activity records that include time
7. Worksheet: Solving Word Problems Involving Time and Duration	- Accurately solve word problems involving time and duration.	- Collaboratively analyze problems and practice solving time and duration word problems.

Assessment Includes:

1. Knowledge: Achieve a score of 60% or higher.
2. Mathematical Skills and Processes: Achieve an evaluation level of 2 or higher.
3. Desirable Characteristics: Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
1.Telling Time in Hours and Minutes	The student can accurately tell time in hours and minutes with at least 80% accuracy.	The student can tell time in hours and minutes with 70–79% accuracy.	The student can tell time in hours and minutes with 60–69% accuracy.	The student can tell time in hours and minutes with less than 60% accuracy.
2. Writing and Reading Time Using a Period (.) or a Colon (:)	The student can accurately write and read time using a period (.) or a colon (:) with at least 80% accuracy.	The student can write and read time using correct symbols with 70–79% accuracy.	The student can write and read time using correct symbols with 60–69% accuracy.	The student can write and read time using correct symbols with less than 60% accuracy.
3. Expressing Duration in Hours and Minutes	The student can accurately express duration in hours and minutes with at least 80% accuracy.	The student can express duration with 70–79% accuracy.	The student can express duration with 60–69% accuracy.	The student can express duration with less than 60% accuracy.
4. Comparing Durations Using Hour–Minute Relationships	The student can accurately compare durations using hour–minute relationships with at least 80% accuracy.	The student can compare durations with 70–79% accuracy.	The student can compare durations with 60–69% accuracy.	The student can compare durations with less than 60% accuracy.

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
5. Reading and Writing Activity Logs with Specified Times	The student can accurately read and write activity logs with time references with at least 80% accuracy.	The student can read and write activity logs with 70–79% accuracy.	The student can read and write activity logs with 60–69% accuracy.	The student can read and write activity logs with less than 60% accuracy.
6. Solving Word Problems Involving Time and Duration	The student can accurately solve word problems related to time and duration with at least 80% accuracy.	The student can solve such problems with 70–79% accuracy.	The student can solve such problems with 60–69% accuracy.	The student can solve such problems with less than 60% accuracy.

Chapter 4

Mathematics (M13101)

Content: Geometric shapes

Time: 10 hours

Strand 2: Measurement And Geometry

Standard M2.2: Understanding and analyzing geometric patterns The Treasure of geometry is the relationship between geometric shapes and geometric theorem and applied.

Grade level indicators

GR. 2.2 P.3/1 Students identify 2-dimensional geometric shapes that have lines of symmetry and state the number of lines of symmetry.

Learning Content

- Shapes with lines of symmetry
- Characteristics of symmetrical figures

Core Concept

A line of symmetry is a line that divides a figure into two mirror-image halves . When a shape is folded along the line of symmetry, both sides match exactly. Some shapes have only one line of symmetry, while others have more than one.

Desirable Traits

- Honesty and Integrity
- Lifelong Learning Mindset

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1. Worksheet: Identifying 2D Geometric Shapes with Lines of Symmetry	- Students can identify 2-dimensional geometric shapes that have lines of symmetry and describe the characteristics of symmetrical shapes accurately.	- Study and learn from real-life materials and instructional media to explore 2D shapes with lines of symmetry and describe their symmetrical properties.
2. Worksheet: Stating the Number of Lines of Symmetry in 2D Shapes	- Students can correctly state the number of lines of symmetry for various 2-dimensional geometric shapes.	- Participate in group discussions, hands-on practice, and learning activities to determine how many lines of symmetry each 2D shape has.

Assessment Includes:

1. **Knowledge:** Achieve a score of 60% or higher.
2. **Mathematical Skills and Processes:** Achieve an evaluation level of 2 or higher.
3. **Desirable Characteristics:** Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
1. Identifying Shapes with Lines of Symmetry	Student can identify shapes that have lines of symmetry with at least 80% accuracy.	Student can identify shapes that have lines of symmetry with 70–79% accuracy.	Student can identify shapes that have lines of symmetry with 60–69% accuracy.	Student can identify shapes that have lines of symmetry with less than 60% accuracy.
2. Identifying Shapes with Multiple Lines of Symmetry and Stating the Number of Lines	Student can identify shapes with multiple lines of symmetry and state the number of lines with at least 80% accuracy.	Student can identify shapes with multiple lines of symmetry and state the number of lines with 70–79% accuracy.	Student can identify shapes with multiple lines of symmetry and state the number of lines with 60–69% accuracy.	Student can identify shapes with multiple lines of symmetry and state the number of lines with less than 60% accuracy.
3. Applying Knowledge of Symmetry in Real-Life or Mathematical Contexts	Student can apply knowledge of symmetry with at least 80% accuracy.	Student can apply knowledge of symmetry with 70–79% accuracy.	Student can apply knowledge of symmetry with 60–69% accuracy.	Student can apply knowledge of symmetry with less than 60% accuracy.

Chapter 5

Mathematics (M13101)

Content: Picture charts and one way table

Time: 12 hours

Strand 3: Data Analysis and Probability

Standard M3.1: Understanding Statistical process and ability to apply statistical methodology for data analysis to solve the problem.

Grade level indicators

M3.1 Gr3/1 Draw and write a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step

M3.1 Gr3/2 Write the one way table from the number data and using one way table data to find the answer

Learning Content

- Data collection and classification
- Reading and creating pictographs (picture graphs)
- Reading and creating one-way tables

Core Concept

Data collection involves gathering factual information about a specific topic or area of interest. Classifying data helps to organize it for easier use and analysis.

A **pictograph** (picture graph) uses images or symbols to represent quantities. The number of symbols used depends on the data and the scale defined in the graph.

Data can also be presented using a **one-way table**, which organizes information clearly in a single category or direction.

Key Competencies

- **Communication skills:** Ability to express understanding and explain data clearly
- **Thinking skills:** Ability to analyze, classify, and interpret data

Desirable Characteristics

- Determination in completing tasks
- Curiosity and eagerness to learn

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1. Worksheet: Reading and Creating Pictographs	- Students can gather and classify data about themselves and their surroundings in daily life, and create accurate pictographs from that data.	- Study, explore, and practice planning how to collect data on a topic of personal interest, then represent the data as a pictograph.
2. Worksheet: Interpreting Pictographs and Answering Questions	- Students can accurately interpret comparative data shown in pictographs and answer related questions.	- Learn through group discussions, analyzing sample pictographs, and practice answering questions based on the presented data.
3. Worksheet: Reading and Creating One-Way Tables	- Students can read and construct one-way tables correctly.	- Work in groups to collect and organize data, create a one-way table, and present and peer-assess their work collaboratively.

Assessment Includes:

1. **Knowledge:** Achieve a score of 60% or higher.
2. **Mathematical Skills and Processes:** Achieve an evaluation level of 2 or higher.
3. **Desirable Characteristics:** Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
1. Data Collection and Classification (about self and daily environment)	Student can collect and classify data about themselves and their surroundings with at least 80% accuracy.	Student can collect and classify data with 70–79% accuracy.	Student can collect and classify data with 60–69% accuracy.	Student can collect and classify data with less than 60% accuracy.

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
2. Reading Pictographs	Student can interpret pictographs with at least 80% accuracy.	Student can interpret pictographs with 70–79% accuracy.	Student can interpret pictographs with 60–69% accuracy.	Student can interpret pictographs with less than 60% accuracy.
3. Creating Pictographs	Student can create pictographs accurately ($\geq$ 80%).	Student can create pictographs with 70–79% accuracy.	Student can create pictographs with 60–69% accuracy.	Student can create pictographs with less than 60% accuracy.
4. Reading and Comparing One-Way Tables	Student can read, compare, and answer questions based on one-way tables with $\geq$ 80% accuracy.	Student can do so with 70–79% accuracy.	Student can do so with 60–69% accuracy.	Student can do so with less than 60% accuracy.
5. Creating One-Way Tables	Student can construct one-way tables correctly ($\geq$ 80%).	Student can construct one-way tables with 70–79% accuracy.	Student can construct one-way tables with 60–69% accuracy.	Student can construct one-way tables with less than 60% accuracy.

Chapter 6**Mathematics (M13101)****Content: Fraction****Time: 13 hours**

Strand 1: Numbers and Operations

Standard M1. 1: Understanding diverse methods of presenting numbers and their application in real life

Grade level indicators

- M1. 1 Gr3/3 Telling, Reading and Writing fraction as a number on the number line; represent fractions on a number line diagram.
- M1. 1 Gr3/4 Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole.
- M1. 1 Gr3/10 Find the sum of fractions with like denominators where the total does not exceed 1, and find the difference of fractions with like denominators.
- M1. 1 Gr3/11 Write the solution to solve word problems of the addition and subtraction of fractions as equivalent (equal) if they are the same size, or the same point on a number line.

Learning Content

- Fractions with numerators less than or equal to their denominators
- Comparing and ordering fractions
- Addition and subtraction of fractions
- Solving word problems involving the addition and subtraction of fractions

Core Student Competencies

- Communication skills
- Thinking skills

Desirable Student Attributes

- Determination in completing tasks
- Love of learning

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1. Worksheet: Identifying, Reading, and Writing Fractions to Represent Quantities	- Students can identify, read, and write fractions to represent quantities and illustrate objects based on given fractions accurately.	- Study, explore, and practice how to represent quantities using fractions through examples and exercises.
2. Worksheet: Comparing and Ordering Fraction	- Students can accurately compare and order fractions	- Study, analyze together, and practice comparing and ordering fractions using guided practice and group activities.
3. Worksheet: Addition and Subtraction of Fractions	- Students can correctly perform addition and subtraction of fractions.	- Practice exercises focused on adding and subtracting fractions with like denominators.
4. Worksheet: Solving Word Problems Involving Fraction Addition and Subtraction	- Students can correctly solve word problems involving the addition and subtraction of fractions.	- Learn and analyze word problems together, followed by individual and group practice to solve fraction-based word problems. - Engage in structured exercises to reinforce solving word problems involving fraction addition and subtraction.

Assessment Includes:

1. Knowledge: Achieve a score of 60% or higher.
2. Mathematical Skills and Processes: Achieve an evaluation level of 2 or higher.
3. Desirable Characteristics: Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
1. Reading and Writing Fractions to Represent Quantities	Student can read and write fractions to represent quantities with accuracy $\geq 80\%$.	Student can read and write fractions to represent quantities with 70–79% accuracy.	Student can read and write fractions to represent quantities with 60–69% accuracy.	Student can read and write fractions to represent quantities with less than 60% accuracy.
2. Comparing and Ordering Fractions with Like Denominators	Student can compare and order fractions with like denominators $\geq 80\%$ accuracy.	Student can compare and order fractions with 70–79% accuracy.	Student can compare and order fractions with 60–69% accuracy.	Student can compare and order fractions with less than 60% accuracy.
3. Comparing and Ordering Fractions with Like Numerators	Student can compare and order fractions with like numerators $\geq 80\%$ accuracy.	Student can compare and order fractions with 70–79% accuracy.	Student can compare and order fractions with 60–69% accuracy.	Student can compare and order fractions with less than 60% accuracy.
4. Adding and Subtracting Fractions with Like Denominators	Student can add and subtract fractions with like denominators $\geq 80\%$ accuracy.	Student can add and subtract fractions with 70–79% accuracy.	Student can add and subtract fractions with 60–69% accuracy.	Student can add and subtract fractions with less than 60% accuracy.
5. Solving Word Problems Involving Addition and Subtraction of Fractions	Student can solve word problems involving addition and subtraction of fractions with $\geq 80\%$ accuracy.	Student can solve word problems involving addition and subtraction of	Student can solve word problems involving addition and subtraction of fractions with 60–69% accuracy.	Student can solve word problems involving addition and subtraction of fractions with less

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
		fractions with 70–79% accuracy.		than 60% accuracy.

Chapter 7

Mathematics (M13101)

Content: Multiplication

Time: 16 hours

Strand 1: Numbers and Operations

Standard M1.1: Understanding diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr.3/6 finding answer of the unknown whole number by using Mathematical symbols showing multiply one-digit with four- digit and two-digit with two- digit

M 1.1 Gr. 3/8 Find the result of addition, subtraction, multiplication, and division of mixed operations involving whole numbers up to 100,000 and zero.

M 1.1 Gr. 3/9 Show the method to find the answer to two-step word problems involving whole numbers up to 100,000 and zero.

Learning Content

1. Multiplying a one-digit number by a number up to four digits
2. Multiplying two-digit numbers by two-digit numbers
3. Multiplication word problems
4. Creating multiplication word problems

Key Concepts

Multiplying a one-digit number by 100, 200, 300, ... 900 or by 1,000, 2,000, 3,000, ... 9,000: Find the product by multiplying the one-digit number by 1, 2, 3, ... 9 and then adding two or three zeros at the end.

Finding the product of a one-digit number and a number up to four digits by setting up the multiplication: multiply the units digit first, then the tens, hundreds, and thousands digits in order.

Multiplying a two-digit number by a multiple of 10: multiply the two-digit number by the whole number, then add a zero at the end.

Multiplying a two-digit number by another two-digit number: use the distributive property by place value, multiply starting from the units place and then the tens place, and then add the results together.

Finding the unknown value in an equation can be solved using multiplication facts.

Solving word problems involves understanding the problem, planning, solving, finding the answer, and checking the reasonableness of the solution.

Creating word problems should include both the given information and the question.

Key Competencies for Learners

1. Communication skills
2. Thinking skills

Desired Characteristics

3. Perseverance in work
4. Eagerness to learn

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1. Worksheet on Multiplication Multiplying a one-digit number by a number up to four digits	- Multiply a one-digit number by a number up to four digits correctly	- Review the meaning of multiplication, learn, and practice multiplying a one-digit number by a number up to four digits
2. Worksheet on Multiplication Multiplying two-digit numbers by two-digit numbers	- Multiply two-digit numbers by two-digit numbers correctly	- Learn and practice multiplying two-digit numbers by two-digit numbers
3. Worksheet on Multiplication Word Problems	- Solve multiplication word problems and find correct answers	- Analyze word problems together and practice solving multiplication word problems and finding answers
4. Worksheet on Creating Multiplication Word Problems	- Create multiplication word problems correctly	- Analyze the process of creating multiplication word problems together using group work

Assessment Includes:

1. **Knowledge:** Achieve a score of 60% or higher.
2. **Mathematical Skills and Processes:** Achieve an evaluation level of 2 or higher.
3. **Desirable Characteristics:** Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
1. Multiplication of a one-digit number by a number up to four digits	Students can multiply a one-digit number by a number up to four digits with 80% or higher accuracy ร้อยละ 80 ขึ้นไป	Students can multiply a one-digit number by a number up to four digits with 70% - 79% accuracy	Students can multiply a one-digit number by a number up to four digits with 60% - 69% accuracy	Students can multiply a one-digit number by a number up to four digits with less than 60% accuracy
2. Multiplication of two-digit numbers by two-digit numbers	Students can multiply two-digit numbers by two-digit numbers with 80% or higher accuracy	Students can multiply two-digit numbers by two-digit numbers with 70% - 79% accuracy	Students can multiply two-digit numbers by two-digit numbers with 60% - 69% accuracy	Students can multiply two-digit numbers by two-digit numbers with less than 60% accuracy
3. Finding the unknown value in multiplication equations	Students can find the unknown value in multiplication equations with 80% or higher accuracy	Students can find the unknown value in multiplication equations with 70% - 79% accuracy	Students can find the unknown value in multiplication equations with 60% - 69% accuracy	Students can find the unknown value in multiplication equations with less than 60% accuracy
4. Multiplication word problems	Students can solve multiplication word problems with 80% or higher accuracy	Students can solve multiplication word problems with 70% - 79% accuracy	Students can solve multiplication word problems with 60% - 69% accuracy	Students can solve multiplication word problems with less than 60% accuracy
5. Creating multiplication word problems	Students can create multiplication word problems with 80% or higher accuracy	Students can create multiplication word problems with 70% - 79% accuracy	Students can create multiplication word problems with 60% - 69% accuracy	Students can create multiplication word problems with less than 60% accuracy

Chapter 8**Mathematics (M13101)****Content: Division****Time: 17 hours**

Strand 1: Numbers and Operations

Standard M1. 1: Understanding diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr.3/7 finding answer of the unknown whole number by using Mathematical symbols for division that dividend not more than 4 digits divide with 1-digit divisor .

M 1.1 Gr. 3/8 Find the result of addition, subtraction, multiplication, and division of mixed operations involving whole numbers up to 100,000 and zero.

M 1.1 Gr. 3/9 Show the method to find the answer to two-step word problems involving whole numbers up to 100,000 and zero.

Learning Content

Division where the dividend is no more than four digits and the divisor is a one-digit number

Word problems involving division

Creating word problems involving division

Key Concepts

Finding quotients and remainders using long division:

When dividing at any place value, write the single-digit quotient for that specific place.

If the dividend has 2 digits and the divisor has 1 digit, begin dividing from the tens place, then move to the units place.

If the dividend has 3 digits, start from the hundreds place, then tens, and units.

If the dividend has 4 digits, start from the thousands place, then hundreds, tens, and units respectively.

Finding quotients and remainders using short division (for dividends up to four digits and one-digit divisors):

Apply the same principle as in long division—write the single-digit quotient for each place value.

Finding unknown values in division sentences can be done by applying the relationship between multiplication and division.

Solving word problems:

Read and understand the problem, make a plan, solve the problem, find the answer, and check the reasonableness of the answer.

Creating word problems:

1. A complete word problem must contain both the given information and the question being
2. asked. The problem created should also be realistic and possible.

Key Competencies for Learners

- Communication skills
- Thinking skills

Desired Characteristics

- Determination in work
- Love of learning

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1. Worksheet on Division	- Understanding division where the dividend does not exceed four digits and the divisor is a single digit	- Study the meaning and methods of division by examining examples of multiplication and division, answering questions, and participating in group discussions - Practice skills through exercises and activities
2. Worksheet on Division Word Problems	- Solving division word problem - Creating division word problems	- Learn to solve word problems by reading and understanding the problem, planning the solution, finding the answer, and checking the reasonableness of the result - Practice creating problems that include both the given information and the question - Develop skills through practice and exercises

Assessment Includes:

1. **Knowledge:** Achieve a score of 60% or higher.
2. **Mathematical Skills and Processes:** Achieve an evaluation level of 2 or higher.
3. **Desirable Characteristics:** Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
1. Finding the Unknown in Division Sentences <i>where the dividend is no more than 4 digits and the divisor is a one-digit number</i>	Students can find the value of the unknown in a division sentence with a dividend up to 4 digits and a one-digit divisor with 80% or higher accuracy.	Students can find the value of the unknown in a division sentence with a dividend up to 4 digits and a one-digit divisor with 70% - 79% accuracy.	Students can find the value of the unknown in a division sentence with a dividend up to 4 digits and a one-digit divisor with 60% - 69% accuracy.	Students can find the value of the unknown in a division sentence with a dividend up to 4 digits and a one-digit divisor with less than 60% accuracy.
2. Solving Mixed Operations (Addition, Subtraction, Multiplication, Division) <i>Involving whole numbers up to 100,000 and zero</i>	Students can solve mixed operations with whole numbers up to 100,000 and zero with 80% or higher accuracy.	Students can solve mixed operations with whole numbers up to 100,000 and zero with 70% - 79% accuracy.	Students can solve mixed operations with whole numbers up to 100,000 and zero with 60% - 69% accuracy.	Students can solve mixed operations with whole numbers up to 100,000 and zero with less than 60% accuracy.

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
3. Two-Step Word Problems <i>Involving whole numbers up to 100,000 and zero</i>	Students can show the method to solve two-step word problems with whole numbers up to 100,000 and zero with 80% or higher accuracy.	Students can show the method to solve two-step word problems with whole numbers up to 100,000 and zero with 70% - 79% accuracy.	Students can show the method to solve two-step word problems with whole numbers up to 100,000 and zero with 60% - 69% accuracy.	Students can show the method to solve two-step word problems with whole numbers up to 100,000 and zero with less than 60% accuracy.

Chapter 9

Mathematics (M13101)

Content: Measure of Length

Time: 18 hours

Strand 2: Measurement and geometry

Standard M2.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Grade level indicators

M2.1 Gr3/3 Using appropriate measuring tools to measure and tell length in metres, centimetres and millimetres

M2.1 Gr3/4 Estimate the answer of the length in metres and centimetres.

M2.1 Gr3/5 Comparing the length between centimetres and millimetres/kilometres and metres from the situation.

M2.1 Gr3/6 Write the solution to solve word problems about the length in centimetres and millimetres/ centimetres, kilometres and metres.

Learning Content

- Measuring length in centimeters and millimeters, meters and centimeters, kilometers and meters
- Choosing appropriate measuring tools for length
- Estimating length in meters and centimeters
- Comparing lengths using the relationship between units of length
- Solving word problems involving length

Key Concepts

- Expressing the length of objects in centimeters and millimeters, or in meters and centimeters
 - 10 millimeters = 1 centimeters
 - 100 centimeters = 1 meters
- Distance may be expressed in kilometers or in kilometers and meters
 - 1,000 meters = 1 kilometers
- When measuring the length of objects, appropriate tools and units of measurement should be chosen for accuracy.
- Estimating length in meters and centimeters involves giving an approximate measurement without using measuring tools, aiming to be as close as possible to the actual length.
- Comparing lengths or distances with different units requires converting all values to the same unit using unit conversion relationships before comparing.
- Solving word problems involves reading and understanding the problem, planning the solution, finding the answer, and verifying the reasonableness of the answer.

- Word problems may require the use of addition, subtraction, multiplication, or division involving measurements of length.

Key Competencies for Learners

- Communication skills
- Thinking skills

Desired Characteristics

- Determination in work
- Love of learning

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1. Worksheet: Measuring Length in Centimeters	- Measuring length in centimeters	- Studying the unit of length: centimeter - Practicing length measurement using a ruler
2. Worksheet: Measuring Length in Meters	- Measuring length in meters	- Studying the unit of length: meter - Practicing measurement using a meter stick, tape measure, and measuring tape
3. Worksheet: Comparing Lengths and Heights	- Comparing lengths and heights	- Practicing comparison using units such as meters, centimeters, and millimeters
4. Worksheet: Estimating Length and Distance	- Estimating length and distance	- Group activities and discussions on estimating length and distance - Practicing estimation using real objects or places with measurable lengths and distances
5. Worksheet: Solving Word Problems Related to Length and Distance	- Solving word problems involving length and distance	- Studying and practicing problem-solving processes

Assessment Includes:

1. **Knowledge:** Achieve a score of 60% or higher.
2. **Mathematical Skills and Processes:** Achieve an evaluation level of 2 or higher.
3. **Desirable Characteristics:** Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
1. Selecting Appropriate Measuring Tools and Measuring Lengths Measure and report the length of various objects in centimeters and millimeters, meters and centimeters	The student can appropriately select measuring tools and accurately measure and report lengths in centimeters and millimeters, meters and centimeters with 80% or higher accuracy.	The student can do so with 70–79% accuracy.	The student can do so with 60–69% accuracy.	The student can do so with less than 60% accuracy.
2. Estimating Length in Meters and Centimeters	The student can estimate length in meters and centimeters with 80% or higher accuracy.	The student can estimate length in meters and centimeters with 70–79% accuracy.	The student can estimate length in meters and centimeters with 60–69% accuracy.	The student can estimate length in meters and centimeters with less than 60% accuracy.

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
3. Comparing Lengths Between Units <i>Comparing centimeters and millimeters, meters and centimeters, kilometers and meters in various situations</i>	The student can compare lengths between centimeters and millimeters, meters and centimeters, kilometers and meters in different situations with 80% or higher accuracy.	The student can do so with 70–79% accuracy.	The student can do so with 60–69% accuracy.	The student can do so with less than 60% accuracy.
4. Solving Word Problems Involving Length	The student can clearly show how to solve word problems involving these units with 80% or higher accuracy.	The student can do so with 70–79% accuracy.	The student can do so with 60–69% accuracy.	The student can do so with less than 60% accuracy.

Chapter 10

Mathematics (M13101)

Content: Let's measure of weight

Time: 16 hours

Strand 2: Measurement and geometry

Standard M2.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Grade level indicators

M2.1 Gr3/7 Using appropriate weighing machine to measure and tell weight in kilogrammes and grammes.

M2.1 Gr3/8 Estimate the answer of the weight in kilogrammes and grammes.

M2.1 Gr3/9 Comparing the weight between kilogrammes and grammes/metric ton and grammes from the situation.

M2.1 Gr3/10 Demonstrate methods for solving word problems involving weight using units of kilograms and grams, as well as metric tons and kilograms.

Learning Content

1. Choosing appropriate weighing instruments
2. Estimating weight in kilograms and hectograms
3. Comparing weights using the relationship between kilograms and grams, metric tons and kilograms
4. Solving word problems involving weight

Key Concepts

Weight can be expressed in **kilograms and hectograms**, or in **kilograms and grams**.

When measuring the weight of objects, it is important to choose a suitable scale and use appropriate units of measurement.

Estimating weight means giving an approximate weight of an object without using a scale. This can be done by comparing it to known weights of familiar objects.

When comparing weights that use **different units**, convert them to the **same unit** first using the relationships:

1 kilogram = 1,000 grams

1 metric ton = 1,000 kilograms

To **solve word problems** about weight, students should:

Read and understand the problem

Plan how to solve it

Find the answer

Check if the answer is reasonable

Solving these problems may involve using addition, subtraction, multiplication, or division with weight units.

Key Competencies for Learners

1. Communication skills
2. Thinking skills

Desirable Characteristics

1. Determination in working
2. Eagerness to learn

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1. Reading weight in kilograms, grams, and hectograms	- Learning how to read weights in kilograms, grams, and hectograms - Choosing appropriate weighing scales	- Studying standard types of scales and units used for weighing (kilograms) - Practicing reading weight values correctly using suitable weighing tools
2. Comparing weights using unit relationships	- Comparing weights based on the relationship between	- Studying how to compare weights using kilograms, grams, and hectogram - Using supplementary media and learning materials for exploration - Practicing skills in converting and comparing different weight units
3. Estimating weights of various objects	- Activities to estimate the weight of different objects without using a scale	- Group discussions about estimation techniques and actual weight reading - Practicing weight estimation based on familiar object weights - Comparing estimated weight with actual weight for better accuracy

Work Pieces / Assignments	Assessment Criteria	Learning Activities
4. Solving real-world problems related to weight	- Using mathematical language and symbols to clearly express solutions - Group activities for solving word problems involving weight	- Group activities for solving word problems involving weight - Practice reading and understanding problems, planning solutions, finding answers, and checking for reasonableness - Develop analytical thinking skills by solving problems from sentence strips

Assessment Includes:

1. **Knowledge:** Achieve a score of 60% or higher.
2. **Mathematical Skills and Processes:** Achieve an evaluation level of 2 or higher.
3. **Desirable Characteristics:** Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
1. Selecting appropriate scales and measuring in kilograms and hectograms	Students can select appropriate scales and measure weights in kilograms and hectograms with at least 80% accuracy.	Students can do so with 70–79% accuracy.	Students can do so with 60–69% accuracy.	Students can do so with less than 60% accuracy.
2. Estimating weights in kilograms and hectograms	Students can estimate weights in kilograms and hectograms with at least 80% accuracy.	Students can do so with 70–79% accuracy.	Students can do so with 60–69% accuracy.	Students can do so with less than 60% accuracy.

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
3. Comparing weights: kilograms to grams, metric tons to kilograms	Students can compare weights using conversion between kilograms and grams, metric tons and kilograms from various contexts with at least 80% accuracy.	with 70–79% accuracy.	with 60–69% accuracy.	with less than 60% accuracy.
4. Solving word problems involving weight (kg & g, metric tons & kg)	Students can demonstrate methods for solving word problems involving weights in kilograms and grams, or metric tons and kilograms with at least 80% accuracy.	with 70–79% accuracy.	with 60–69% accuracy.	with less than 60% accuracy.

Chapter 11

Mathematics (M13101)

Content: Measureing Volume

Time: 18 hours

Strand 2: Measurement and geometry

Standard M2.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Grade level indicators

M2.1Gr3/11 Using appropriate measuring tools to measure and compare volume capacity in litres and milliliters.

M2.1Gr3/12 Estimate the answer of the volume and the capacity in litres.

M2.1Gr3/13 Write the solution to solve word problems about of the volume and the capacity in litres and milliliters.

Learning Content

- Measuring volume and capacity in liters and milliliters
- Selecting appropriate measuring tools
- Estimating volume and capacity in liters
- Comparing volume and capacity using the relationships between liters, milliliters, teaspoons, tablespoons, and measuring cups with milliliters
- Solving word problems involving volume and capacity with units in liters and milliliters

Key Concepts

- Volume and capacity of containers can be expressed in liters, milliliters, or a combination of both. When measuring the volume of various substances, appropriate measuring tools should be used, and the volume should be stated in suitable units.
- Estimating the volume and capacity of containers in liters involves making an approximate judgment of the actual volume or capacity without using measuring tools.
- When comparing volumes or capacities of different items with different units, it is necessary to convert all measurements to the same unit before making comparisons. Use the following conversions:
 - 1 liter = 1,000 milliliters
 - 1 teaspoon = 5 milliliters
 - 1 tablespoon = 15 milliliters
 - 1 measuring cup = 250 milliliters
- To solve word problems, students should read and understand the problem, make a plan to solve it, find the answer, and verify the reasonableness of the result.

Core Competencies of Learners

- Communication skills
- Thinking skills

Desirable Characteristics

- Diligence in work
- Love of learning

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1. Worksheet: Measuring Volume and Capacity in Liters and Milliliters (Using Appropriate Measuring Tools)	- Measuring volume and capacity in liters and milliliters (using appropriate measuring tools)	- Studying measuring tools and the units used in measurement, focusing on liters -Practicing measurement skills using measuring instruments
2. Worksheet: Comparing Volume and Capacity Using the Relationship Between Liters, Milliliters, Teaspoons, Tablespoons, and Measuring Cups	- Comparing volume and capacity using the relationship between liters, milliliters, teaspoons, tablespoons, and measuring cups	- Studying how to compare the volume and capacity of different items - Practicing the process of comparing volume and capacity
3. Worksheet: Estimating Volume and Capacity in Liters	- Estimating volume and capacity in liters	- Group activities related to estimating volume and capacity in liters
4. Worksheet: Solving Word Problems Involving Volume and Capacity in Liters and Milliliters	- Solving word problems involving volume and capacity in liters and milliliters	- Studying measurement-related word problems - Practicing problem analysis, solving problems, finding answers, and verifying reasonableness

Assessment Includes:

1. **Knowledge:** Achieve a score of 60% or higher.
2. **Mathematical Skills and Processes:** Achieve an evaluation level of 2 or higher.
3. **Desirable Characteristics:** Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
1. Selecting Appropriate Measuring Tools and Measuring/Comparing Volume and Capacity in Liters and Milliliters	Students can select appropriate measuring tools to measure and compare volume and capacity in liters and milliliters with 80% accuracy or higher.	Students can select appropriate measuring tools to measure and compare volume and capacity in liters and milliliters with 70%–79% accuracy.	Students can select appropriate measuring tools to measure and compare volume and capacity in liters and milliliters with 60%–69% accuracy.	Students can select appropriate measuring tools to measure and
2. Estimating Volume and Capacity in Liters	Students can accurately estimate volume and capacity in liters at 80% or above.	Students can estimate volume and capacity in liters with 70%–79% accuracy.	Students can estimate volume and capacity in liters with 60%–69% accuracy.	Students can estimate volume and capacity in liters with less than 60% accuracy.
3. Solving Word Problems Involving Volume and Capacity in Liters and Milliliters	Students can demonstrate methods to solve word problems involving volume and capacity with units in liters and milliliters at 80% accuracy or higher.	Students can demonstrate methods to solve such problems with 70%–79% accuracy.	Students can demonstrate methods to solve such problems with 60%–69% accuracy.	Students can demonstrate methods to solve such problems with less than 60% accuracy.

Chapter 12**Mathematics (M13101)****Content: Learning about Money****Time: 15 hours**

Strand 2: Measurement and geometry

Standard M2.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Grade level indicators

M2.1 Gr3/1 Write the solution to solve word problems about money.

Learning Content

- Expressing amounts of money and writing money amounts using a decimal point
- Comparing amounts of money and exchanging money
- Reading and recording income and expenses
- Solving money-related word problems

Key Concepts

- Expressing amounts of money using different banknotes and coins by stating amounts in baht, satang, or both baht and satang. Representing money using various banknotes and coins according to the specified amount.
- Writing money amounts using a decimal point: a dot is used to separate baht and satang, and the unit “baht” is written at the end. When reading amounts written with a decimal point, the numbers before the dot represent baht, and the numbers after the dot represent satang.
- Comparing amounts of money by first comparing the baht amounts; if the baht amounts are equal, then compare the satang amounts.
- Money can be exchanged only if the amount exchanged equals the amount received.
- Solving word problems involves reading and understanding the problem, planning a solution, finding the answer, and verifying the reasonableness of the solution.
- Recording income and expenses includes a title, date (day, month, year), and a table. The table records the date (day, month, year), the item, income, expenses, and the remaining balance.

Core Competencies of Learners

- Communication skills
- Thinking skills

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1. Worksheet: Expressing Amounts of Money and Writing Money Amounts Using a Decimal Point	- Expressing amounts of money and writing amounts using a decimal point	- Studying how to express and write money amounts with a decimal point - Practicing reading and writing money amounts
2. Worksheet: Comparing Amounts of Money and Exchanging Money	- Comparing amounts of money and exchanging money	- Practicing skills in comparing money amounts and exchanging money - Group activities on comparing amounts of money
3. Worksheet: Reading and Writing Income and Expense Record	- Reading and writing income and expense records	- Activities involving reading and writing income and expense record
4. Worksheet: Solving Word Problems Related to Money	- Solving word problems related to money - Creativity in creating word problems	- Practicing problem-solving processes related to money - Creating word problems based on real-life situations

Assessment Includes:

- 1. Knowledge:** Achieve a score of 60% or higher.
- 2. Mathematical Skills and Processes:** Achieve an evaluation level of 2 or higher.
- 3. Desirable Characteristics:** Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
1. Expressing and Writing Money Amounts Using a Decimal Point	Students can express and write money amounts using a decimal point with 80%	Students can express and write money amounts using a decimal point	Students can express and write money amounts using a decimal point	Students can express and write money amounts using a decimal point with less

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
	accuracy or higher.	with 70%–79% accuracy.	with 60%–69% accuracy.	than 60% accuracy.
2. Comparing Amounts of Money and Exchanging Money	Students can compare amounts of money and exchange money with 80% accuracy or higher.	Students can compare amounts of money and exchange money with 70%–79% accuracy.	Students can compare amounts of money and exchange money with 60%–69% accuracy.	Students can compare amounts of money and exchange money with less than 60% accuracy.
3. Reading and Writing Income and Expense Records	Students can read and write income and expense records with 80% accuracy or higher.	Students can read and write income and expense records with 70%–79% accuracy.	Students can read and write income and expense records with 60%–69% accuracy.	Students can read and write income and expense records with less than 60% accuracy.
4. Showing Methods to Solve Money-Related Word Problems	Students can demonstrate methods to solve money-related word problems with 80% accuracy or higher.	Students can demonstrate methods to solve money-related word problems with 70%–79% accuracy.	Students can demonstrate methods to solve money-related word problems with 60%–69% accuracy.	Students can demonstrate methods to solve money-related word problems with less than 60% accuracy.

Chapter 13

Mathematics (M13101)

Content: Mathematical skill and processes

Time: 16 hours

Strand 1: Numbers and Operations

Standard M1.1: Understanding diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.2 Gr3/1 Perform addition, subtraction, multiplication, and division—including mixed operations—of whole numbers not exceeding 100,000 and zero, with an awareness of the reasonableness of the answers.

M1.2 Gr3/2 Analyze and show the steps to solve word problems and mixed-operation problems involving whole numbers not exceeding 100,000 and zero, with an awareness of the reasonableness of the answers, and create word problems.

Learning Content

- Mixed operations: addition, subtraction, multiplication, and division
- Word problems involving mixed operations
- Creating word problems involving mixed operations

Key Concepts

- To solve mixed operations (addition, subtraction, multiplication, and division), calculate expressions in parentheses first, then find the final result.
- Comparing results of mixed operations can be done by evaluating which result is greater, smaller, or equal—sometimes without full calculation.
- Solving two-step word problems involving addition, subtraction, multiplication, or division involves:
 - Reading and understanding the problem
 - Planning a solution
 - Finding the answer
 - Verifying the reasonableness of the result
- Creating two-step word problems must include both the given information and the question being asked.

Core Competencies of Learners

- Communication skills
- Thinking skills
-

Desirable Characteristics

- Diligence in work
- Love of learning

Work Pieces and Assignments:

Work Pieces / Assignments	Assessment Criteria	Learning Activities
1. Worksheet on addition, subtraction, multiplication and division	-Addition, subtraction, multiplication, division Mixed	Learn the meaning and methods of addition, subtraction, multiplication, division Summarize knowledge as a mind map
2. Worksheet on Showing how to do Mixed addition, subtraction, multiplication, and division problems	Shows how to solve problems involving addition, subtraction, multiplication, and division.	Practice skills of addition, subtraction, multiplication, mixed division, solving problems, creating problems
3. Worksheet on showing how to solve problems involving addition, subtraction, multiply	- Addition, subtraction, multiplication, division Mixed - Demonstration of problem solving Mixed addition, subtraction, multiplication, division problems - Demonstration of problem solving Mixed addition, subtraction, multiplication, division	- Practice problem analysis skills, show how to solve problems, find answers and check answers appropriately Use a variety of methods - Practice teamwork skills to analyze, solve problems, find answers and check answers
4. Worksheet on Creating Addition, Subtraction, Multiplication, and Division Problem	- Work on creating problem-solving Addition, subtraction, multiplication, division - Using a variety of methods to solve problems - Being creative in creating problems	- Study how to create problems from real objects or search for information from learning materials - Practice creating problems - Doing worksheet activities

Assessment Includes:

1. **Knowledge:** Achieve a score of 60% or higher.
2. **Mathematical Skills and Processes:** Achieve an evaluation level of 2 or higher.
3. **Desirable Characteristics:** Achieve an evaluation level of 2 or higher.

Assessment Criteria

Assessment Aspect	Quality Levels			
	Excellent (4)	Good (3)	Excellent (4)	Needs Improvement (1)
1. Finding the result of addition, subtraction, multiplication, division of numbers not exceeding 100,000 and 0	Students can find the results of addition, subtraction, multiplication, and division of numbers not exceeding 100,000 and 0 80% or more	Students can find the results of mixed addition, subtraction, multiplication and division of whole numbers not exceeding 100,000 and 0 70 – 79 percent	Students can find the results of mixed addition, subtraction, multiplication and division of numbers not exceeding 100,000 and 0 at 60 – 69 percent.	Students can find the mixed addition, subtraction, multiplication and division results of whole numbers not exceeding 100,000 and 0 less than 60 percent.
2. Problem 2 steps of numbers not exceeding 100,000 and 0	Students can demonstrate 80% or more of their ability to find the answer to a two-step problem involving numbers up to 100,000 and zero.	Students can demonstrate how to find the answer to a 2-step problem of numbers up to 100,000 and 0 at 70-79%.	Students can demonstrate how to find the answer to a 2-step problem of numbers up to 100,000 and 0 at 60-69%.	Students can demonstrate how to find the answer to a two-step problem involving numbers up to 100,000 and zero. Less than 60 percent
3. Creating Addition, subtraction, multiplication, and division problems and finding the answer	Students can create addition, subtraction, multiplication, and division problems and find answers at least 80%.	Students can create mixed addition, subtraction, multiplication, and division problems and find the answers. 70 – 79%	Students can create mixed addition, subtraction, multiplication, and division problems and find the answers 60-69%.	Students can create mixed addition, subtraction, multiplication, and division problems and find the answers. Less than 60 percent

Grade 4 Unit Design Framework

Chapter 1

Mathematics (M14101)

Content: Numbers Greater than 100,000

Time: 12 hours

Strand 1: Numbers and Operations

Standard M1.1: Understanding diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr4/1 Write and read Hindu-Arabic and Thai numerals and written forms showing cardinal numbers, 0, fractions, and one-place decimals.

M1.1 Gr4/2 Compare and arrange sequence of cardinal numbers and 0, fractions, and one-place decimals.

Learning Objective

Students will be taught to :

1. Understand numbers greater than 100,000.
2. Compare and order numbers greater than 100,000.
3. Recognize and extend number patterns formed by counting on and counting back.
4. Estimation of counts and use of the symbol of =

Learning Outcomes

Students will be able to:

1. Count, read and write numbers greater than 100,000 in numerals.
2. Identify place value and value of each digit.
3. Write numbers in expanded form.
4. Compare and order numbers greater than 100,000.
5. Count forward and count backward.
6. Extend number sequences.
7. Complete missing terms in given number sequences.

Learning Areas

- Reading and writing numbers greater than 100,000
- Place value, digit value and using zero as a placeholder
- Writing numbers in the expanded form
- Comparing numbers
- Ordering numbers
- Number patterns

Teaching and Learning Activities

1. Guide students to understand hundreds, thousands and millions. Guide students to read and write the numbers.
2. Write a few numbers containing more than 5 digits on the board and have students read them and write the number words.
3. Write a 7-digit number on the board and explain the place value of each digit and its value. Emphasize that a zero in a number has a place value.
4. Get three students to write numbers containing more than five digits. Then, get the other students to state the place value of each digit in each number and its value.
5. When expanding numbers, it is better for students to present a number in a place value table first before writing it in expanded form. Try a few numbers with zero.
6. Remind students of the signs of comparison and the terms used in comparison such as 'greater than', 'more than', 'less than', 'smaller than', 'equal to' and 'not equal to'.
7. Emphasize to students to first compare the number of digits when comparing two numbers before comparing the values of the leftmost digits.
8. Remind students of the meanings of ascending and descending.
9. Explain what number pattern is. The number pattern may increase or decrease.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Writing and reading numbers greater than 100,000	- Writing Hindu-Arabic numerals, Thai numerals and number letters	Study of reading and writing of numbers
2. The emergence of the main principles of millions, tens of millions, and hundreds of millions	Telling the value of each digit	Study of the origin of numbers using an abacus
3. Telling the value of each digit in a number greater than 100,000	Writing numbers greater than 100,000 in expanded form	Study examples of stating the value of each digit in a given number.
4. Writing numbers greater than 100,000 in expanded form	Writing numbers greater than 100,000 in expanded form	A study of writing shows numbers greater than 100,000 in expanded form.
5. A study of writing shows numbers greater than 100,000 in expanded form.	Comparing and sorting numbers greater than 100,000	Study of principles and methods for comparing and ordering numbers greater than 100,000.
6. Approximation to the nearest ten, hundred, thousand, ten thousand, hundred thousand, and million.	Approximate values using symbols of $\approx$	Study of approximation to integers of ten, hundred, thousand, ten thousand, hundred thousand and million.

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Writing and Reading Hindu-Arabic numerals Thai numerals and letters representing counting numbers greater than 100,000	Students can correctly write and read Hindu-Arabic numerals, Thai numerals and letters representing numbers greater than 100,000. with 80% accuracy or higher.	Students can correctly write and read Hindu-Arabic numerals, Thai numerals and letters representing numbers greater than 100,000. with 70%–79% accuracy.	Students can correctly write and read Hindu-Arabic numerals, Thai numerals and letters representing numbers greater than 100,000. with 60%–69% accuracy.	Students can correctly write and read Hindu-Arabic numerals, Thai numerals and letters representing numbers greater than 100,000. with less than 60% accuracy.
2. Cutting board shows the number of counts greater than 100,000 in distribution form	Students can correctly write numbers greater than 100,000. with 80% accuracy or higher.	Students can correctly write numbers greater than 100,000. with 70%–79% accuracy.	Students can correctly write numbers greater than 100,000. with 60%–69% accuracy.	Students can correctly write numbers greater than 100,000. with less than 60% accuracy.
3. Comparing and sorting Counts greater than 100,000 from various situations	Students can correctly compare and order numbers greater than 100,000. with 80% accuracy or higher.	Students can correctly compare and order numbers greater than 100,000. with 70%–79% accuracy	Students can correctly compare and order numbers greater than 100,000. with 60%–69% accuracy.	Students can correctly compare and order numbers greater than 100,000. with less than 60% accuracy.
4. Approximation Approximate values are integers of ten, hundred, thousand, ten	Students can estimate values to the nearest ten, hundred, thousand, ten	Students can estimate values to the nearest ten, hundred, thousand, ten	Students can estimate values to the nearest ten, hundred, thousand, ten	Students can estimate values to the nearest ten, hundred, thousand, ten

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
thousand, hundred thousand, million... and their application	thousand, hundred thousand, million... correctly. with 80% accuracy or higher.	thousand, hundred thousand, million... correctly. with 70%–79% accuracy	thousand, hundred thousand, million... correctly. with 60%–69% accuracy.	thousand, hundred thousand, million... correctly. with less than 60% accuracy.

Chapter 2

Mathematics (M14101)

Content: Addition and Subtraction greater than 100,000

Time: 13 hours

Strand 1: Numbers and Operations

Standard M1.1: Understanding diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr4/7 estimated results of **addition subtract, multiplied**, division from various situations reasonably.

M1.1 Gr4/8 Find the value of the unknown in mathematical statement showing addition and mathematical statement showing subtract of cardinal numbers more than 100,000 and 0

Learning Objective

Students will be taught to :

1. Perform addition of numbers.
2. Perform subtraction of numbers.
3. Perform computations involving addition and subtraction to solve word problems.

Learning Outcomes

Students will be able to:

1. Add up two numbers.
2. Add up three numbers.
3. List the properties of addition.
4. Subtract two numbers.
5. Subtract three numbers.
6. Solve word problems involving addition and subtraction.
7. Solve problems and word problems involving combined (addition and subtraction) operations.

Learning Areas

- Addition
- Subtraction
- Combined operations

Teaching and Learning Activities

1. Guide students to add two numbers using the standard written method. Remind them to align the digits of same place values vertically and add up them up beginning from the digits in ones. Regroup when necessary.

2. Guide students to add up three numbers. They can either add up all the three numbers at once or add up two numbers first before adding the third number.

3. Write three numbers on the boards and have students add them up.

4. There are two properties of addition that students should know – the commutative property of addition and the associative property of addition.

5. Guide students to subtract two numbers using the standard written method. Remind them to align the digits of same place values vertically and subtract them beginning from the digits in ones. Regroup when necessary.

6. Guide students to subtract three numbers. Emphasize that for subtraction of three numbers, we subtract the second number from the first number. Then, we subtract the third number from the initial answer to get the final answer.

7. Explain the meaning of combined operations.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Adding two numbers greater than 100,000	Adding numbers greater than 100,000	Study of Addition of 2 Numbers More than 100,000
2. Subtraction of numbers greater than 100,000 2 numbers	Subtracting numbers greater than 100,000	Study of deletion of numbers more than 100,000 2 numbers
3. Finding the sum by approximation	Finding the sum and the minus by using the nearest ten, hundred, or thousand values.	Study of positive and negative effects By using estimates
4. Calculations using a calculator	Basic use of a calculator	Study of calculations using a calculator to find addition, subtraction, multiplication and division results.

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
5. Finding the Value of Unknowns from Symbolic Addition Sentences	Finding the unknown value with a plus sign	Study of finding the value of unknowns from addition symbolic sentences
6. Finding the value of an unknown from Subtraction symbolic sentences	Finding the unknown value with a minus sign	Study of finding the value of unknowns from subtraction symbolic sentences
7. Using the solution of problems to find the value of unknowns from the symbolic sentences of addition and subtraction	Applying knowledge about finding unknown values to problem solving	Study of the application of knowledge on finding unknown values to solve problems
8. Analysis of problems involving addition and subtraction of whole numbers	Addition and subtraction problems	Study of the analysis of problems involving addition and subtraction of whole numbers
9. Creating addition and subtraction word problems	- Creating a problem from a given symbolic sentence - Creating problem sets from given situations	- Study of problem solving - Addition and subtraction of whole numbers

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Adding two numbers greater than 100,000	Students can correctly write and read Hindu-Arabic numerals, Thai numerals and letters representing numbers greater than 100,000. with 80% accuracy or higher.	Students can correctly write and read Hindu-Arabic numerals, Thai numerals and letters representing numbers greater than 100,000. with 70%–79% accuracy.	Students can correctly write and read Hindu-Arabic numerals, Thai numerals and letters representing numbers greater than 100,000. with 60%–69% accuracy.	Students can correctly write and read Hindu-Arabic numerals, Thai numerals and letters representing numbers greater than 100,000. with less than 60% accuracy.
2. Subtraction of numbers greater than 100,000 2 numbers	Students can correctly find the negative integers greater than 100,000. with 80% accuracy or higher.	Students can correctly find the negative integers greater than 100,000. with 70%–79% accuracy.	Students can correctly find the negative integers greater than 100,000. with 60%–69% accuracy.	Students can correctly find the negative integers greater than 100,000. with less than 60% accuracy.
3. Finding the sum by approximation	Students can find the sum by using approximation correctly. with 80% accuracy or higher.	Students can find the sum by using approximation correctly. with 70%–79% accuracy.	Students can find the sum by using approximation correctly. with 60%–69% accuracy.	Students can find the sum by using approximation correctly. with less than 60% accuracy.

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
4. Calculations using a calculator	Students can find negative results using correct approximation. with 80% accuracy or higher.	Students can find negative results using correct approximation. with 70%–79% accuracy.	Students can find negative results using correct approximation. with 60%–69% accuracy.	Students can find negative results using correct approximation. with less than 60% accuracy.
5. Finding the Value of Unknowns from Symbolic Addition Sentences	Students can use a calculator to find addition, subtraction, multiplication and division correctly. with 80% accuracy or higher.	Students can use a calculator to find addition, subtraction, multiplication and division correctly. with 70%–79% accuracy.	Students can use a calculator to find addition, subtraction, multiplication and division correctly. with 60%–69% accuracy.	Students can use a calculator to find addition, subtraction, multiplication and division correctly. with less than 60% accuracy.
6. Finding the value of an unknown from Subtraction symbolic sentences	Students can correctly find the value of unknowns in addition sentences. with 80% accuracy or higher.	Students can correctly find the value of unknowns in addition sentences. with 70%–79% accuracy.	Students can correctly find the value of unknowns in addition sentences. with 60%–69% accuracy.	Students can correctly find the value of unknowns in addition sentences. with less than 60% accuracy.
7. Using the solution of problems to find the value of unknowns from the symbolic sentences of	Students can correctly find the value of the unknown in a subtraction symbolic sentence.	Students can correctly find the value of the unknown in a subtraction symbolic sentence.	Students can correctly find the value of the unknown in a subtraction symbolic sentence.	Students can correctly find the value of the unknown in a subtraction symbolic sentence.

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
addition and subtraction	with 80% accuracy or higher.	with 70%–79% accuracy.	with 60%–69% accuracy.	with less than 60% accuracy.
8. Analysis of problems involving addition and subtraction of whole numbers	Students can apply their knowledge about finding the value of unknowns to solve problems correctly. with 80% accuracy or higher.	Students can apply their knowledge about finding the value of unknowns to solve problems correctly. with 70%–79% accuracy.	Students can apply their knowledge about finding the value of unknowns to solve problems correctly. with 60%–69% accuracy.	Students can apply their knowledge about finding the value of unknowns to solve problems correctly. with less than 60% accuracy.
9. Creating addition and subtraction word problems	Students can analyze and solve addition and subtraction problems correctly. with 80% accuracy or higher.	Students can analyze and solve addition and subtraction problems correctly. with 70%–79% accuracy.	Students can analyze and solve addition and subtraction problems correctly. with 60%–69% accuracy.	Students can analyze and solve addition and subtraction problems correctly. with less than 60% accuracy.
10. Creating Addition and subtraction problems	Students can correctly create addition and subtraction problems. with 80% accuracy or higher.	Students can correctly create addition and subtraction problems. with 70%–79% accuracy.	Students can correctly create addition and subtraction problems. with 60%–69% accuracy.	Students can correctly create addition and subtraction problems. with less than 60% accuracy.

Chapter 3

Mathematics (M14101)

Content: Multiplication

Time: 24 hours

Strand 1: Numbers and Operations

Standard M1.1: Understanding diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr4/7 estimated results of **addition subtract, multiplied**, division from various situations reasonably.

M1.1 Gr4/9 Find the value of the unknown in the mathematical statement showing multiplied multiples digit 6 Number with product not exceeding 6 value and mathematical statements showing dividend not exceeding 6

Learning Objective

Students will be taught to :

1. Understand properties of multiplication.
2. Multiply of any two numbers.
3. Solve word problems involving multiplication.

Learning Outcomes

Students will be able to:

1. List the properties of multiplication.
2. Multiply 1-digit numbers by multiple-digit numbers.
3. Multiply 2-digit numbers by 3-digit numbers.
4. Multiply 3-digit numbers by 3-digit numbers.
5. Multiply of multiple-digit numbers.
6. Use multiplication to solve word problems.

Learning Areas

- Properties of multiplication
- Multiplication of 1-digit numbers by multiple-digit numbers
- Multiplication of 2-digit numbers by 3-digit numbers
- Multiplication of 3-digit numbers by 3-digit numbers
- Multiplication of multiple-digit numbers
- Using multiplication to solve word problems

Teaching and Learning Activities

1. There are a few properties of multiplication – commutative property, associative property, distributive property, multiplication by 1 and multiplication 0.
2. When multiplying numbers, write them in the standard written method. Start to multiply from the digit in the ones place. Regroup when necessary.
3. Guide students on how to multiply 3-digit numbers by 20, 30, ..., 90. Just multiply the 3-digit numbers by 2, 3, ..., 9 before multiplying the result by 10.
4. When multiplying 2-digit numbers by 100, just add two zeros at the right end of the 2-digit numbers.
5. When multiplying 2-digit numbers by 200, 300, 400, ..., 900, multiply the 2-digit numbers with 2, 3, ..., 9 and add two zeros at the right end of the products.
6. When multiplying a 2-digit number by a 3-digit number, write them in the standard written method. First multiply the ones, then multiply the tens and add up the products.
7. When multiplying a 3-digit number by a 3-digit number, write them in the standard written method. First multiply the ones, then the tens, follow by the hundreds and add up the products.
8. This goes the same for multiplication of multiple-digit numbers.
9. Sometimes in word problems, we need to use multiplication to solve them.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Multiplication 1-digit and 4-digit numbers	- Multiplication of numbers - Considering rationality	- Study multiplication of 1-digit numbers with 4-digit numbers
2. Multiplication 2-digit numbers and more than 2-digit numbers	- Multiplication of whole numbers - Consider the rationality	- Study the multiplication of 2-digit numbers with numbers greater than 2 digits.
3. Multiplication Numbers greater than 2 digits With numbers greater than 2 digits	- Multiplication of numbers - Considering rationality	- Study of multiplication of numbers more than 2 digits with numbers more than 2 digits
4. Division where the dividend is more than 4 digits and the divisor is 1 digit	- Division of whole numbers (long division)	- Study of division where the dividend is more than 4 digits and the divisor is 1 digit.
5. Division Where the dividend is more than 4 digits The divisor has 1 digit	- Division of whole numbers (short division)	- Study of division where the dividend is more than 4 digits and the divisor is 1 digit.
6. Division where Divisor has 2 digits	- Division of whole numbers (long division)	- Study of division with 2 digits of divisor
7. Division where The divisor has 3 digits	- Division of whole numbers (long division)	- Study of division with 3 digits of divisor

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
8. Finding the value of Unknown (symbolic sentence with x)	- The product of any two numbers when divided by any one of the two numbers, the resulting quotient is equal to the other number.	Study of finding the value of unknowns in the symbolic sentence marked with X
9. Finding the value of Unknown (Symbolic sentence With $\div$ sign)	- The product of any two numbers when divided by any one of the two numbers, the resulting quotient is equal to the other number.	- Study of finding the value of unknowns in symbolic sentences with $\div$ symbol
10. Patterns of Multiplication and division	- Multiplication and division of numbers	- Study of the patterns of multiplication and division.
11. Problem solving Multiplication and division	- Solving problems involving multiplication and division of whole numbers	- Study of multiplication and division problems.
12. Creating Multiplication and division problems	- Creating problems involving multiplication and division of whole numbers	- Study of problem solving

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Multiplication 1-digit and 4-digit numbers	Students can find the product of 1-digit and 4-digit numbers correctly. with 80% accuracy or higher.	Students can find the product of 1-digit and 4-digit numbers correctly. with 70%–79% accuracy.	Students can find the product of 1-digit and 4-digit numbers correctly. with 60%–69% accuracy.	Students can find the product of 1-digit and 4-digit numbers correctly. with less than 60% accuracy.
2. Multiplication 2-digit numbers and more than 2-digit numbers	Students can correctly multiply the product of 2-digit numbers with more than 2-digit numbers. with 80% accuracy or higher.	Students can correctly multiply the product of 2-digit numbers with more than 2-digit numbers. with 70%–79% accuracy.	Students can correctly multiply the product of 2-digit numbers with more than 2-digit numbers. with 60%–69% accuracy.	Students can correctly multiply the product of 2-digit numbers with more than 2-digit numbers. with less than 60% accuracy.
3. Multiplication Numbers greater than 2 digits With numbers greater than 2 digits	Students can correctly multiply the product of a two-digit number by a two-digit number.	Students can correctly multiply the product of a two-digit number by a two-digit number. with 70%–79% accuracy.	Students can correctly multiply the product of a two-digit number by a two-digit number. with 60%–69% accuracy.	Students can correctly multiply the product of a two-digit number by a two-digit number. with less than 60% accuracy.

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	with 80% accuracy or higher.			
4. Division by the dividend is more than 4 digits and the divisor is 1 digit	Students can correctly calculate quotients with a digit greater than 4 and a digit divisor. with 80% accuracy or higher.	Students can correctly calculate quotients with a digit greater than 4 and a digit divisor. with 70%–79% accuracy.	Students can correctly calculate quotients with a digit greater than 4 and a digit divisor. with 60%–69% accuracy.	Students can correctly calculate quotients with a digit greater than 4 and a digit divisor. with less than 60% accuracy.
5. Division by Divisor has 2 digits	Students can correctly find the quotient with 2 digits as the divisor. with 80% accuracy or higher.	Students can correctly find the quotient with 2 digits as the divisor. with 70%–79% accuracy.	Students can correctly find the quotient with 2 digits as the divisor. with 60%–69% accuracy.	Students can correctly find the quotient with 2 digits as the divisor. with less than 60% accuracy.
6. Division by The divisor has 3 digits	Students can correctly find the quotient with 3 digits as the divisor. with 80% accuracy or higher.	Students can correctly find the quotient with 3 digits as the divisor. with 70%–79% accuracy.	Students can correctly find the quotient with 3 digits as the divisor. with 60%–69% accuracy.	Students can correctly find the quotient with 3 digits as the divisor. with less than 60% accuracy.
7. Finding the value of Unknown (symbolic sentence with x)	Students can find the correct value of unknowns.	Students can find the correct value of unknowns. with 70%–79% accuracy.	Students can find the correct value of unknowns. with 60%–69% accuracy.	Students can find the correct value of unknowns. with less than 60% accuracy.

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	with 80% accuracy or higher.			
8. Finding the value of Unknown (Symbolic sentence With $\div$ sign)	Students can find the correct value of unknowns. with 80% accuracy or higher.	Students can find the correct value of unknowns. with 70%–79% accuracy.	Students can find the correct value of unknowns. with 60%–69% accuracy.	Students can find the correct value of unknowns. with less than 60% accuracy.
9. Patterns of Multiplication and division	Students can find the correct multiplication and division patterns. with 80% accuracy or higher.	Students can find the correct multiplication and division patterns. with 70%–79% accuracy.	Students can find the correct multiplication and division patterns. with 60%–69% accuracy.	Students can find the correct multiplication and division patterns. with less than 60% accuracy.
10. Problem solving Multiplication and division	Students can solve multiplication and division problems correctly. with 80% accuracy or higher.	Students can solve multiplication and division problems correctly. with 70%–79% accuracy.	Students can solve multiplication and division problems correctly. with 60%–69% accuracy.	Students can solve multiplication and division problems correctly. with less than 60% accuracy.
11. Creating Multiplication and division problems	Students can Create multiplication and division problems correctly.	Students can Create multiplication and division problems correctly. with 70%–79% accuracy.	Students can Create multiplication and division problems correctly. with 60%–69% accuracy.	Students can Create multiplication and division problems correctly. with less than 60% accuracy.

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	with 80% accuracy or higher.			

Chapter 4

Mathematics (M14101)

Content: Multiplication

Time: 19 hours

Strand 1: Numbers and Operations

Standard M1.1: Understanding diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr4/10 find result addition, subtract, multiplied, mix addition of cardinal numbers and 0

M1.1 Gr4/11 showing how to find answers of word problems 2 steps of cardinal numbers greater than 100,000 and 0

M1.1 Gr4/12 creating word problems 2 steps of cardinal numbers and 0 with find answers

Learning Objective

Students will be taught to :

1. Understand properties of multiplication.
2. Multiply of any two numbers.
3. Solve word problems involving multiplication.

Learning Outcomes

Students will be able to:

1. List the properties of multiplication.
2. Multiply 1-digit numbers by multiple-digit numbers.
3. Multiply 2-digit numbers by 3-digit numbers.
4. Multiply 3-digit numbers by 3-digit numbers.
5. Multiply of multiple-digit numbers.
6. Use multiplication to solve word problems.

Learning Areas

- Properties of multiplication
- Multiplication of 1-digit numbers by multiple-digit numbers
- Multiplication of 2-digit numbers by 3-digit numbers
- Multiplication of 3-digit numbers by 3-digit numbers
- Multiplication of multiple-digit numbers
- Using multiplication to solve word problems

Teaching and Learning Activities

1. There are a few properties of multiplication – commutative property, associative property, distributive property, multiplication by 1 and multiplication 0.
2. When multiplying numbers, write them in the standard written method. Start to multiply from the digit in the ones place. Regroup when necessary.
3. Guide students on how to multiply 3-digit numbers by 20, 30, ..., 90. Just multiply the 3-digit numbers by 2, 3, ..., 9 before multiplying the result by 10.
4. When multiplying 2-digit numbers by 100, just add two zeros at the right end of the 2-digit numbers.
5. When multiplying 2-digit numbers by 200, 300, 400, ..., 900, multiply the 2-digit numbers with 2, 3, ..., 9 and add two zeros at the right end of the products.
6. When multiplying a 2-digit number by a 3-digit number, write them in the standard written method. First multiply the ones, then multiply the tens and add up the products.
7. When multiplying a 3-digit number by a 3-digit number, write them in the standard written method. First multiply the ones, then the tens, follow by the hundreds and add up the products.
8. This goes the same for multiplication of multiple-digit numbers.
9. Sometimes in word problems, we need to use multiplication to solve them.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Mixed addition, subtraction, multiplication and division with parentheses	- Addition, subtraction, multiplication and division mixed with parentheses	- Study of addition, subtraction, multiplication and division with parentheses.
2. Mixed addition, subtraction, multiplication, and division No parentheses	- Mixed addition, subtraction, multiplication and division Without parentheses	- Study of addition, subtraction, multiplication and division without parentheses.
3. Addition, subtraction, multiplication and division with and without parentheses	- Mixed addition, subtraction, multiplication and division	- Study of addition, subtraction, multiplication and division with and without parentheses.
4. โจทย์ปัญหาการบวก ลบ คูณ และหารระคน	- Solving mixed addition, subtraction, multiplication, and division problems	- Study of problem solving Mixed addition, subtraction, multiplication and division
5. Creating mixed addition, subtraction, multiplication and division problems.	- Creating mixed addition, subtraction, multiplication and division problems and finding the answers.	- Study of problem creation: Addition, subtraction, multiplication and division

Assessment Includes

1. Knowledge: Students must score at least 60 percent.
2. Mathematical Skills and Processes: Must achieve Level 2 or above.
3. Desirable Characteristics: Must achieve Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Mixed addition, subtraction, multiplication and division with parentheses	Students can correctly find the results of addition, subtraction, multiplication and division in parentheses. with 80% accuracy or higher.	Students can correctly find the results of addition, subtraction, multiplication and division in parentheses. with 70%–79% accuracy.	Students can correctly find the results of addition, subtraction, multiplication and division in parentheses. with 60%–69% accuracy.	Students can correctly find the results of addition, subtraction, multiplication and division in parentheses. with less than 60% accuracy.
2. Mixed addition, subtraction, multiplication, and division No parentheses	Students can correctly find the results of addition, subtraction, multiplication and division without parentheses. with 80% accuracy or higher.	Students can correctly find the results of addition, subtraction, multiplication and division without parentheses. with 70%–79% accuracy.	Students can correctly find the results of addition, subtraction, multiplication and division without parentheses. with 60%–69% accuracy.	Students can correctly find the results of addition, subtraction, multiplication and division without parentheses. with less than 60% accuracy.
3. Addition, subtraction, multiplication and division with and without parentheses	Students can correctly find the results of addition, subtraction, multiplication and division with and without parentheses.	Students can correctly find the results of addition, subtraction, multiplication and division with and without parentheses. with 70%–79% accuracy.	Students can correctly find the results of addition, subtraction, multiplication and division with and without parentheses. with 60%–69% accuracy.	Students can correctly find the results of addition, subtraction, multiplication and division with and without parentheses. with less than 60% accuracy.

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	with 80% accuracy or higher.			
4. Mixed Operations Word Problems (Addition, Subtraction, Multiplication, and Division)	Students can correctly solve mixed addition, subtraction, multiplication and division problems. with 80% accuracy or higher.	Students can correctly solve mixed addition, subtraction, multiplication and division problems. with 70%–79% accuracy.	Students can correctly solve mixed addition, subtraction, multiplication and division problems. with 60%–69% accuracy.	Students can correctly solve mixed addition, subtraction, multiplication and division problems. with less than 60% accuracy.
5. Creating mixed addition, subtraction, multiplication and division problems.	Students can create mixed addition, subtraction, multiplication and division problems correctly. with 80% accuracy or higher.	Students can create mixed addition, subtraction, multiplication and division problems correctly. with 70%–79% accuracy.	Students can create mixed addition, subtraction, multiplication and division problems correctly. with 60%–69% accuracy.	Students can create mixed addition, subtraction, multiplication and division problems correctly. with less than 60% accuracy.

Chapter 5

Mathematics (M14101)

Content: Time

Time: 12 hours

Strand 2: Measurement

Standard M2.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Grade level indicators

M2.1 Gr4/1 Write and read Hindu-Arabic and Thai numerals and written forms showing cardinal numbers, 0, fractions, and one-place decimals.

Learning Objective

Students will be taught to :

1. Read time from clocks.
2. Tell duration of time.
3. Read and extract data from timetables, programs and calendars.
4. Prepare schedules.
5. Understand the relationships between units of time.
6. Solve word problems involving time.

Learning Outcomes

Students will be able to:

1. Read time according to the 24-hour system and 12-hour system.
2. Calculate the duration of time.
3. Analyze and extract data from timetables.
4. Analyze and extract data from programs.
5. Analyze and extract data from calendars.
5. Know the relationships between units of time.
6. Convert between units of time.
7. Solve word problems involving time.

Learning Areas

- Time
- Duration of time
- Schedule (timetable)
- Schedule (program)
- Calendar
- Relationships between units of time
- Solving word problems involving time

Teaching and Learning Activities

1. Show students an analogue clock. Ask them for the names of the hands on the clock. Show them a time and ask them to read the time.
2. Explain that we can read time using two systems – 24-hour system and 12-hour system.
3. Explain what 24-hour system is.
4. Explain what 12-hour system is. Explain also a.m. and p.m., and how we use them.
5. Show a few times on an analogue clock and ask them to read out the times using the 12-hour system.
6. We can calculate the duration of time between two times. We can draw two clocks to show the times and count difference in time.
7. We can see programs when there are events such as a celebration, a festival and a trip. We should learn how to read and extract information from these programs.
8. We use calendars. Calendars give information of time in a larger scale

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Chapter 6

Mathematics (M14101)

Content: Fraction

Time: 23 hours

Strand 1: Numbers and Operations

Standard M1.1: Understanding diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr4/3 Describe, read and write fractions, mixed numbers, showing quantity and showing things according fractions, mixed numbers assigned.

M1.1 Gr4/4 Compare, arrange fractions and mixed numbers, one denominator is multiple of another.

M1.1 Gr4/13 Find sum, quotient of fraction and mixed numbers that a denominator is multiple of each another.

M1.1 Gr4/14 Showing how to find answers of word problems addition subtracts fraction and mixed numbers that a denominator is multiple of each another.

Learning Objective

Students will be taught to :

1. Understand fraction.
2. Compare and order fractions.
3. Understand equivalent fractions.
4. Add and subtract fractions.
5. Solve word problems involving fractions.

Learning Outcomes

Students will be able to:

1. Identify equal parts and non-equal parts.
2. Identify pictures that have parts shaded correctly to represent fractions.
3. Read and write fractions.
4. Compare fractions with the same denominator.
5. Compare fractions with the same numerator.
6. Arrange fractions in ascending and descending orders.
7. Determine equivalent fractions.
8. Add fractions with the same denominator.
9. Subtract fractions with the same denominator.
10. Solve word problems involving fractions.

Learning Areas

- Reading and writing fractions
- Comparing fractions
- Ordering fractions
- Equivalent fractions
- Operations involving fractions
- Solving word problems involving fractions

Teaching and Learning Activities

1. Make students understand equal parts and non-equal parts.
2. Draw a few shapes with parts in them. Ask students to identify if the shapes are divided into equal parts.
3. Guide students how to read and write fraction.
4. Write a few fractions on the board and a few circles. Ask students to shade the circles correctly to represent.
5. When comparing fractions with the same denominator, we should compare the numerators. The fraction with greater numerator has greater value.
6. Remind students of the signs used in comparison.
7. Write a few fractions with the same denominator and ask students to identify the smallest fraction.
8. When comparing the fractions with the same numerator, we should compare the denominators. The fraction with greater denominator has smaller value.
9. Remind students the meaning of ascending and descending.
10. Explain what equivalent fractions are. Write two fractions on the board and ask students to determine if they are equivalent fractions. Use diagrams to explain the fractions when necessary.
12. When adding fractions with the same denominator, we just add up the numerators and maintain the denominator.
13. Write a few addition problems for students to solve. Use diagrams to explain when necessary.
14. When subtracting fractions with the same denominator, we just subtract the numerators and maintain the denominator.
15. Write a few subtraction problems from students to solve. Use diagrams to explain when necessary.
16. Guide students to solve word problems involving fractions.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet: Telling Time in Minutes and Seconds	- Telling time	- Studying how to tell time in minutes and seconds
2. Worksheet: Telling Time in Minutes, Hours, and Days	- Telling time	- Studying how to tell time in minutes, hours, and days
3. Worksheet: Telling Time in Seconds, Minutes, Hours, Days, Weeks, Months, and Years	- Telling time	- Studying how to tell time in seconds, minutes, hours, days, weeks, months, and years
4. Worksheet: Comparing Time	- Comparing time	- Studying how to compare time durations
5. Worksheet: Reading Timetables	- Reading timetables	- Studying how to read timetables
6. Worksheet: Time Word Problems	- Time word problems	- Studying how to solve time-related word problems

Assessment Components

1. Knowledge: A minimum score of 60 percent.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or higher.
3. Desirable Characteristics: Assessment result must be at Level 2 or higher.

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Telling Time in Minutes and Seconds	Student can accurately tell time in minutes and seconds $\geq$ 80%	Student can accurately tell time in minutes and seconds 70–79%	Student can accurately tell time in minutes and seconds 60–69%	Student can accurately tell time in minutes and seconds $<$ 60%

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
2. Telling Time in Minutes, Hours, and Days	Student can accurately tell time in minutes, hours, and days $\geq 80\%$	Student can accurately tell time in minutes, hours, and days 70–79%	Student can accurately tell time in minutes, hours, and days 60–69%	Student can accurately tell time in minutes, hours, and days $< 60\%$
3. Telling Time in Seconds, Minutes, Hours, Days, Weeks, Months, and Years	Student completes exercises or tests with $\geq 80\%$	Student completes exercises or tests with 70–79%	Student completes exercises or tests with 60–69%	Student completes exercises or tests with $< 60\%$
4. Comparing Time	Student can accurately compare time durations $\geq 80\%$	Student can accurately compare time durations 70–79%	Student can accurately compare time durations 60–69%	Student can accurately compare time durations $< 60\%$
5. Reading Timetables	Student can accurately read timetables $\geq 80\%$	Student can accurately read timetables 70–79%	Student can accurately read timetables 60–69%	Student can accurately read timetables Less than 60% accuracy
6. Time Word Problems	Student can accurately solve time-related word problem $\geq 80\%$	Student can accurately solve time-related word problem 70–79%	Student can accurately solve time-related word problem 60–69%	Student can accurately solve time-related word problem $< 60\%$

Chapter 7

Mathematics (M14101)

Content: Decimals

Time: 20 hours

Strand 1: Numbers and Operations

Standard M1.1: Understanding diverse methods of presenting numbers and their application in real life

Grade level indicators

M1.1 Gr4/5 read and writes decimal less than 3 positions Showing quantity of things and showing things according decimal to assign.

M1.1 Gr4/6 Compare and arrange decimal less than 3 positions from various situations.

M1.1 Gr4/15 Find sum, subtract of fraction not exceeding 3 positions.

M1.1 Gr4/16 Showing how to find Answers of word problems addition, subtract 2 steps of word problems not exceeding 3 positions.

Learning Objective

Students will be taught to :

1. Understand decimals.
2. Comparing and ordering decimals.

Learning Outcomes

Students will be able to:

1. Know the meaning of fractions.
2. Write and read fractions to one decimal place.
3. Identify place values and digit values in decimals.
4. Compare and order decimals.

Learning Areas

- Writing and naming decimals
- Place values and digit values in decimals
- Comparing and ordering decimals

Teaching and Learning Activities

1. Explain the relationship between fractions with 10 as the denominator and decimals.
2. Guide students on how to read decimals.
3. Explain what mixed decimals mean. Explain also the parts of a decimal.
4. Explain that the digit in the fractional part has the place value of tenths.
5. When comparing decimals, we compare the whole numbers first. The decimal with greater whole number has greater value.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Work/Assignment	Assessment Criteria	Learning Activities
1. Worksheet on Reading and Writing Decimals to One Decimal Place	- Able to read and write decimals to one decimal place correctly according to the specified criteria	- Students study and learn how to read and write decimals to one decimal place
2. Worksheet on Reading and Writing Decimals to Two Decimal Places	- Able to read and write decimals to two decimal places correctly according to the specified criteria	- Students study and learn how to read and write decimals to two decimal places
3. Worksheet on Reading and Writing Decimals to Three Decimal Places	- Able to read and write decimals up to three decimal places correctly according to the specified criteria	- Students study and learn how to read and write decimals to three decimal places
4. Worksheet on Comparing and Ordering Decimals	- Able to compare and order decimals up to three decimal places correctly according to the specified criteria	- Students study and learn how to compare and order decimals
5. Worksheet on Addition of Decimals up to Three Decimal Places	- Able to add decimals up to three decimal places correctly according to the specified criteria	- Students study and learn how to add decimals up to three decimal places
6. Worksheet on Subtraction of Decimals up to Three Decimal Places	- Able to subtract decimals up to three decimal places correctly according to the specified criteria	- Students study and learn how to subtract decimals up to three decimal places

Work/Assignment	Assessment Criteria	Learning Activities
7. Worksheet on Two-Step Addition and Subtraction of Decimals up to Three Decimal Places	- Able to perform two-step addition and subtraction of decimals up to three decimal places correctly according to the specified criteria	- Students study and learn how to perform two-step addition and subtraction of decimals up to three decimal places
8. Worksheet on Word Problems Involving Addition and Subtraction of Decimals	- Able to show steps to solve word problems involving addition and subtraction of decimals correctly according to the specified criteria	- Students analyze word problems together and demonstrate the solution steps for solving word problems involving addition and subtraction of decimals

Assessment Components

1. Knowledge: A minimum score of 60 percent.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or higher.
3. Desirable Characteristics: Assessment result must be at Level 2 or higher.

Assessment Criteria

Evaluation Topic	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Reading and Writing Decimals to One Decimal Place	Students can read and write decimals to one decimal place correctly at 80% or above.	Students can read and write decimals to one decimal place correctly with 70%–79% accuracy	Students can read and write decimals to one decimal place correctly with 60%–69% accuracy	Students can read and write decimals to one decimal place correctly with less than 60% accuracy
2. Reading and Writing Decimals to Two Decimal Places	Students can read and write decimals to two decimal places correctly at 80% accuracy or higher	Students can read and write decimals to two decimal places correctly at 70%–79% accuracy	Students can read and write decimals to two decimal places correctly at 60%–69% accuracy	Students can read and write decimals to two decimal places correctly at less than 60% accuracy

Evaluation Topic	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
3. Reading and Writing Decimals to Three Decimal Places	Students can read and write decimals to three decimal places correctly at 80% accuracy or higher	Students can read and write decimals to three decimal places correctly at 70%–79% accuracy	Students can read and write decimals to three decimal places correctly at 60%–69% accuracy	Students can read and write decimals to three decimal places correctly at less than 60% accuracy
4. Comparing and Ordering Decimals	Students can compare and order decimals correctly at 80% accuracy or higher	Students can compare and order decimals correctly at 70%–79% accuracy	Students can compare and order decimals correctly at 60%–69% accuracy	Students can compare and order decimals correctly at less than 60% accuracy
5. Adding Decimals (up to Three Decimal Places)	Students can add decimals (up to three decimal places) correctly at 80% accuracy or higher	Students can add decimals (up to three decimal places) correctly at 70%–79% accuracy	Students can add decimals (up to three decimal places) correctly at 60%–69% accuracy	Students can add decimals (up to three decimal places) correctly at less than 60% accuracy
6. Subtracting Decimals (up to Three Decimal Places)	Students can subtract decimals (up to three decimal places) correctly at 80% or above.	Students can subtract decimals (up to three decimal places) correctly at 70%–79% accuracy	Students can subtract decimals (up to three decimal places) correctly at 70%–79% accuracy	Students can subtract decimals (up to three decimal places) correctly at less than 60% accuracy.
7. Two-Step Addition and Subtraction of Decimals	Students can perform two-step addition and subtraction of decimals correctly at 80% accuracy or higher	Students can perform two-step addition and subtraction of decimals correctly at	Students can perform two-step addition and subtraction of decimals correctly at 60%–69% accuracy	Students can perform two-step addition and subtraction of decimals correctly at less

Evaluation Topic	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
		70%–79% accuracy		than 60% accuracy
8. Showing Steps in Solving Decimal Word Problems (Addition and Subtraction, up to Three Decimal Places)	Students can correctly show the steps to solve word problems involving addition and subtraction of decimals (up to three decimal places) at 80% accuracy or higher	Students can correctly show the steps to solve word problems involving addition and subtraction of decimals (up to three decimal places) at 70%–79% accuracy	Students can correctly show the steps to solve word problems involving addition and subtraction of decimals (up to three decimal places) at 60%–69% accuracy	Students can correctly show the steps to solve word problems involving addition and subtraction of decimals (up to three decimal places) at less than 60% accuracy

Chapter 8

Mathematics (M14101)

Content: Angles

Time: 11 hours

Strand 2: Measurement

Standard M2.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Grade level indicators

M2.1 Gr4/1 Tell the relationship between measuring units for length, weight, volume or capacity and time.

M2.1 Gr4/2 Find area of rectangle.

Learning Objective

Students will be taught to :

1. Understand the relationships between units of length, mass and volume.
2. Estimate length, mass and volume.
3. Solve problems involving length, mass and volume.

Learning Outcomes

Students will be able to:

1. State the relationships between units of length.
2. Convert between units of length.
3. Estimate the lengths of objects.
4. Solve word problems involving length.
5. State the relationships between units of mass.
6. Convert between units of mass.
7. Estimate the masses of objects.
8. Solve word problems involving mass.
9. State the relationships between units of volume.
10. Convert between units of volume.
11. Estimate the volumes and capacities of objects.
12. Solve word problems involving volume.

Learning Areas

- Length
- Mass
- Volume

Teaching and Learning Activities

1. Introduce the unit “kilometer” and “wah” and also their relationships with other units.
2. When we estimate length, we should use the suitable units. We can compare the lengths with known lengths.
3. Introduce the unit ton and also its relationships with other units.
4. Guide students on how to convert between units of mass.
5. When we estimate mass, we should use the suitable units. We can compare the masses with known mass.
6. Introduce the unit cubic meters and cubic centimeters and also their relationships with other units.
7. Guide students on how to convert between units of length.
8. When we estimate volume and capacity, we should use the suitable units.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria	Learning Activities
1. Worksheet: Points, Lines, Rays, and Line Segments	- Able to correctly define points, lines, rays, and line segments as specified.	- Students study and learn the definitions of points, lines, rays, and line segments.
2. Worksheet: Parts of an Angle and Naming Angles	- Able to identify parts of an angle and correctly name the angles.	- Students study and learn the components and naming of angles.
3. Worksheet: Right, Acute, Straight, and Obtuse Angles	- Able to define and specify the size of right, acute, straight, and obtuse angles correctly.	- Students study and learn the meaning and size of right, acute, straight, and obtuse angles.
4. Worksheet: Measuring Angles and Classifying Types of Angles	- Able to measure angles and classify angle types accurately.	- Students practice measuring angles and classifying them by type.

Workpiece / Task Responsibility	Assessment Criteria	Learning Activities
5. Worksheet: Constructing Acute Angles	- Able to construct acute angles using a protractor accurately.	- Students practice constructing acute angles using a protractor.
6. Worksheet: Constructing Right Angles	- Able to construct right angles using a protractor accurately.	- Students practice constructing right angles using a protractor.
7. Worksheet: Constructing Obtuse Angles	- Able to construct obtuse angles using a protractor accurately.	- Students practice constructing obtuse angles using a protractor.
8. Worksheet: Constructing Straight Angles	- Able to construct straight angles using a protractor accurately.	- Students practice constructing straight angles using a protractor.
9. Worksheet: Constructing Reflex Angles	- Able to construct reflex angles using a protractor accurately.	- Students practice constructing reflex angles using a protractor.

Assessment Components

1. Knowledge: A minimum score of 60 percent.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or higher.
3. Desirable Characteristics: Assessment result must be at Level 2 or higher.

Assessment Criteria

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Understanding of Points, Rays, Lines, and Line Segments	Correctly explains with $\geq 80\%$ accuracy	Correctly explains with 70%–79% accuracy	Correctly explains with 60%–69% accuracy	Correctly explains with less than 60% accuracy
2. Identifying and Naming Angle Components	Correctly explains and names with $\geq 80\%$ accuracy	Correctly explains and names with 70%–79% accuracy	Correctly explains and names with 60%–69% accuracy	Correctly explains and names with less than 60% accuracy

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
3. Classifying Angles by Measured Size (acute, right, obtuse, straight)	Accurately classifies with ≥80% accuracy	Accurately classifies with 70%–79% accuracy	Accurately classifies with 60%–69% accuracy	Accurately classifies with less than 60% accuracy
Measuring Angles and Classifying Types	Measures and classifies correctly with ≥80% accuracy	Measures and classifies correctly with 70%–79% accuracy	Measures and classifies correctly with 60%–69% accuracy	Measures and classifies correctly with less than 60% accuracy
5. Constructing Acute Angles	Constructs correctly with ≥80% accuracy	Constructs correctly with 70%–79% accuracy	Constructs correctly with 60%–69% accuracy	Constructs correctly with less than 60% accuracy
6. Constructing Right Angles	Constructs correctly with ≥80% accuracy	Constructs correctly with 70%–79% accuracy	Constructs correctly with 60%–69% accuracy	Constructs correctly with less than 60% accuracy
7. Constructing Obtuse Angles	Constructs correctly with ≥80% accuracy	Constructs correctly with 70–79%	Constructs correctly with 60–69%	Constructs correctly with Less than 60%
8. Constructing Straight Angles	Constructs correctly with ≥80% accuracy	Constructs correctly with 70–79%	Constructs correctly with 60–69%	Constructs correctly with Less than 60%
9. Constructing Reflex Angles	Constructs correctly with ≥80% accuracy	Constructs correctly with 70–79%	Constructs correctly with 60–69%	Constructs correctly with Less than 60%

Chapter 9

Mathematics (M14101)

Content: rectangular

Time: 19 hours

Strand 2: Measurement

Standard M2.1: Understanding the basics of measurement; ability to measure and estimate the size of objects to be measured

Standard M2.2: Solving measurement problems

Grade level indicators

M2.1 Gr4/3 Measuring and making angles by using diagram.

M2.2 Gr4/2 Making rectangular when assigned length of side.

Learning Objective

Students will be taught to :

1. Understand area.
2. Measure the area of a rectangle.
3. Solve word problems involving area.

Learning Outcomes

Students will be able to:

1. Understand concept of area.
2. Compare areas.
3. Measure areas by counting squares.
4. Measure areas in square centimeters.
5. Estimate areas.
6. Measure area of a rectangle by counting squares.
7. Measure area of a rectangle by calculation.
8. Solve word problems involving area.

Learning Areas

- Measuring area
- Measuring the area of a rectangle
- Solving word problems involving area

Teaching and Learning Activities

1. Explain to students what an area is.
2. How do we compare two areas? We can put one area on top of the other to compare.
3. Explain square unit. Cut out a few similar squares and use them to measure area.

4. Inform students that if the lengths of the squares are one centimeter, the squares have an area of 1 square centimeter. Cut out a square of 1 square centimeter. Let students have an idea how big a square centimeter is.

5. We can estimate an area of a shape using a 1-centimeter grid paper.

6. We can find areas of rectangles by dividing the rectangles into square centimeters and calculate the square centimeters.

7. We can calculate the areas of a rectangle by multiplying the length of the rectangle by the width of the rectangle.

8. There are word problems that involve areas.

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria	Learning Activities
1. Worksheet on Types and Properties of Right-Angled Quadrilaterals	- Correctly identify types and properties of right-angled quadrilaterals according to the criteria	- Students study and learn to identify types and properties of right-angled quadrilaterals
2. Worksheet on Types and Properties of Squares and Rectangles	- Correctly identify types and properties of squares and rectangles according to the criteria	- Students study and learn to identify types and properties of squares and rectangles.
3. Worksheet on Constructing Right-Angled Quadrilaterals Using a Set Square	- Construct right-angled quadrilaterals correctly according to the criteria.	- Students study and practice constructing right-angled quadrilaterals using a set square
4. Worksheet on Constructing Right-Angled Quadrilaterals Using a Protractor	- Construct right-angled quadrilaterals correctly according to the criteria	- Students study and practice constructing right-angled quadrilaterals using a protractor
5. Worksheet on Perimeter of Right-Angled Quadrilaterals	- Correctly calculate the perimeter of right-angled quadrilaterals according to the criteria	- Students study the concept of perimeter of right-angled quadrilaterals

Workpiece / Task Responsibility	Assessment Criteria	Learning Activities
6. Worksheet on Perimeter of Polygons	Correctly calculate the perimeter of polygons that can be divided into right-angled quadrilaterals according to the criteria	- Students study the concept of perimeter of polygons that can be decomposed into right-angled quadrilaterals
7. Worksheet on Area of Right-Angled Quadrilaterals	- Correctly calculate the area of right-angled quadrilaterals according to the criteria	- Students study the method of calculating the area of right-angled quadrilaterals
8. Worksheet on Area of Squares and Rectangles	- Correctly calculate the area of squares and rectangles according to the criteria	- Students study the method of calculating the area of squares and rectangles
9. Worksheet on Word Problems about the Perimeter of Right-Angled Quadrilaterals	- Correctly demonstrate problem-solving steps for word problems about the perimeter of right-angled quadrilaterals	- Students collaboratively analyze word problems and demonstrate the problem-solving process to find the perimeter
10. Worksheet on Word Problems about the Area of Right-Angled Quadrilaterals	- Correctly demonstrate problem-solving steps for word problems about the area of right-angled quadrilaterals	- Students collaboratively analyze word problems and demonstrate the problem-solving process to find the area

Assessment Components

1. Knowledge: A minimum score of 60 percent.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or higher.
3. Desirable Characteristics: Assessment result must be at Level 2 or higher.

Assessment Criteria

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Types and Properties of Right-Angled Quadrilaterals	The student correctly identifies the types and properties of	The student correctly identifies the types and properties of	The student correctly identifies the types and properties of	The student correctly identifies the types and properties of

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	right-angled quadrilaterals with at least 80% accuracy.	right-angled quadrilaterals with 70%–79% accuracy	right-angled quadrilaterals with 60%–69% accuracy	right-angled quadrilaterals with less than 60% accuracy
2. Telling Time to the Nearest 5 Minutes	The student correctly identifies the types and properties of squares and rectangles with 80% accuracy or higher	The student correctly identifies the types and properties of squares and rectangles with 70%–79% accuracy	The student correctly identifies the types and properties of squares and rectangles with 60%–69% accuracy	The student correctly identifies the types and properties of squares and rectangles with less than 60% accuracy
3. Telling Duration in Hours and Minutes	The student constructs right-angled quadrilaterals using a set square with 80% accuracy or higher	The student constructs right-angled quadrilaterals using a set square with 70%–79% accuracy	The student constructs right-angled quadrilaterals using a set square with 60%–69% accuracy	The student constructs right-angled quadrilaterals using a set square with less than 60% accuracy
4. Comparing Duration in Hours and Minutes	The student constructs squares using a semicircular protractor with 80% accuracy or higher	The student constructs squares using a semicircular protractor with 70%–79% accuracy	The student constructs squares using a semicircular protractor with 60%–69% accuracy	The student constructs squares using a semicircular protractor with less than 60% accuracy
5. Solving Time-related Word Problems	The student constructs rectangles using a set square with 80% accuracy or higher	The student constructs rectangles using a set square with 70%–79% accuracy	The student constructs rectangles using a set square with 60%–69% accuracy	The student constructs rectangles using a set square with less than 60% accuracy

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
6. Constructing Right-Angled Quadrilaterals Using a Semicircular Protractor	The student constructs right-angled quadrilaterals using a semicircular protractor with at least 80% accuracy.	The student constructs right-angled quadrilaterals using a semicircular protractor with at least 70%–79% accuracy.	The student constructs right-angled quadrilaterals using a semicircular protractor with at 60%–69% accuracy.	The student constructs right-angled quadrilaterals using a semicircular protractor with at less than 60% accuracy.
7. Calculating the Perimeter of Right-Angled Quadrilaterals	The student constructs right-angled quadrilaterals using a semicircular protractor with at least 80% accuracy.	The student constructs right-angled quadrilaterals using a semicircular protractor with at least 70%–79% accuracy.	The student constructs right-angled quadrilaterals using a semicircular protractor with at 60%–69% accuracy.	The student constructs right-angled quadrilaterals using a semicircular protractor with at less than 60% accuracy.
8. Calculating the Perimeter of Polygons	The student accurately calculates the perimeter of polygons with at least 80% accuracy.	The student accurately calculates the perimeter of polygons with at least 70%–79% accuracy.	The student accurately calculates the perimeter of polygons with at 60%–69% accuracy.	The student accurately calculates the perimeter of polygons with at less than 60% accuracy.
9. Calculating the Area of Right-Angled Quadrilaterals	The student accurately calculates the area of right-angled quadrilaterals with at least 80% accuracy.	The student accurately calculates the area of right-angled quadrilaterals with at least 70%–79% accuracy.	The student accurately calculates the area of right-angled quadrilaterals with at 60%–69% accuracy.	The student accurately calculates the area of right-angled quadrilaterals with at less than 60% accuracy.

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
10. Calculating the Area of Squares and Rectangles	The student accurately calculates the area of squares and rectangles with at least 80% accuracy.	The student accurately calculates the area of squares and rectangles with at least 70%–79% accuracy.	The student accurately calculates the area of squares and rectangles with at 60%–69% accuracy.	The student accurately calculates the area of squares and rectangles with at less than 60% accuracy.
11. Problem Solving: Perimeter of Right-Angled Quadrilaterals	The student accurately shows the method to solve perimeter-related word problems involving right-angled quadrilaterals with at least 80% accuracy.	The student accurately shows the method to solve perimeter-related word problems involving right-angled quadrilaterals with at least 70%–79% accuracy.	The student accurately shows the method to solve perimeter-related word problems involving right-angled quadrilaterals with at 60%–69% accuracy.	The student accurately shows the method to solve perimeter-related word problems involving right-angled quadrilaterals with at less than 60% accuracy.
12. Problem Solving: Area of Right-Angled Quadrilaterals	The student accurately shows the method to solve area-related word problems involving right-angled quadrilaterals with at least 80% accuracy.	The student accurately shows the method to solve area-related word problems involving right-angled quadrilaterals with at with at least 70%–79% accuracy.	The student accurately shows the method to solve area-related word problems involving right-angled quadrilaterals with at 60%–69% accuracy	The student accurately shows the method to solve area-related word problems involving right-angled quadrilaterals with at less than 60% accuracy..

Chapter 10

Mathematics (M14101)

Content: Presentation of Information

Time: 25 hours

Strand 3: Geometry

Standard M3.1: Ability to explain and analyse two-dimensional and three-dimensional geometric figures.

Grade level indicators

M3.1 Gr4/1 Identify kind, name and components of angles and write symbols.

Learning Objective

Students will be taught to :

A two-way table is a table that classifies data according to two characteristics. To read a two-way table, one must interpret the data by examining the relationship between the vertical and horizontal categories.

A bar graph is a type of data presentation that uses rectangular bars to represent the quantity of each category. Reading a bar graph involves comparing the height (or length) of each rectangular bar against the numerical scale.

The components of a bar graph include the title and the graph itself.

The title indicates the subject and the time period of the data presented.

The graph consists of the numerical scale, category labels, and rectangular bars representing the quantity of each category. Each bar must have equal width, start at the same baseline of zero, and have equal spacing between adjacent bars..

Learning Areas

- Angles
- Types of angles
- Quadrilaterals
- Diagonals
- Parallel lines
- Circles
- Symmetrical shapes
- Using geometric shapes to design and create
- Patterns

Teaching and Learning Activities

1. Guide students to identify parts of an angle and name types of angles.
2. There are a few types of angles – right angles, acute angles, obtuse angles and straight angle.
3. Explain what quadrilaterals are.
4. Explain the differences between rectangles and squares from other quadrilaterals. From the shapes drawn on the board, identify rectangles and squares.
5. Explain what diagonals are.
6. Explain what parallel lines are.
7. Explain also the symbols we use for parallel lines.
8. Explain the parts of a circle.
9. Guide students to identify symmetrical shapes.
10. Guide students to identify the repeating group of objects or shapes and predict the next object or shape

Emphasized Skills:

1. Thinking skill
2. Problem-solving skill
3. Analyzing skill

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria	Learning Activities
1. Worksheet on Data Collection and Classification	- Accurately collects and classifies data according to the specified criteria	- Students study and practice data collection and classification
2. Worksheet on Using Two-Way Tables to Solve Problems	- Correctly uses data from two-way tables to find solutions to problem scenarios according to the criteria	- Students learn to use data from two-way tables to solve problems
3. Worksheet on Using Bar Graphs to Solve Problems	- Correctly uses data from bar graphs to find solutions to problem scenarios according to the criteria	- Students learn to use data from bar graphs to solve problems
4. Worksheet on Drawing Bar Graphs	- Accurately draws bar graphs according to the specified criteria	- Students study and practice drawing bar graphs

Assessment Criteria

Assessment Criteria	Quality Rating			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Data collection and classification	The student collects and classifies data correctly at 80% or above.	The student collects and classifies data correctly at 70% – 79%.	The student collects and classifies data correctly at 60% – 69%.	The student collects and classifies data correctly below 60%.
2. Using data from two-way tables to solve problems	The student uses data from two-way tables to solve problems correctly at 80% or above.	The student uses data from two-way tables to solve problems correctly at 70% – 79%.	The student uses data from two-way tables to solve problems correctly at 60% – 69%.	The student uses data from two-way tables to solve problems correctly below 60%.
3. Using data from bar graphs to solve problems	The student uses data from bar graphs to solve problems correctly at 80% or above.	The student uses data from bar graphs to solve problems correctly at 70% – 79%.	The student uses data from bar graphs to solve problems correctly at 60% – 69%.	The student uses data from bar graphs to solve problems correctly below 60%.
4. Drawing bar graphs	The student draws bar graphs correctly at 80% or above.	The student draws bar graphs correctly at 70% – 79%.	The student draws bar graphs correctly at 60% – 69%.	The student draws bar graphs correctly below 60%.

Grade 5 Unit Design Framework

Chapter 1

Mathematics (M15101)

Content: Fraction

Time 34 hours

Content and standard of learning

Strand 1: Number and Algebra

Standard M1.1: Understand the diversity of number representations, number systems, and operations on numbers, including their outcomes and properties, and apply this knowledge appropriately.

Grade level indicators

M 1.1 Gr5/3 Find sums and differences of fractions and mixed numbers.

M 1.1 Gr5/4 Find products and quotients of fractions and mixed numbers.

M 1.1 Gr5/5 Demonstrate methods for solving two-step word problems involving addition, subtraction, multiplication, and division of fractions.

Learning Areas

1. Fractions and operations: addition, subtraction, multiplication, and division of fractions.
 - 1.1 Comparison of fractions and mixed numbers.
 - 1.2 Addition and subtraction of fractions and mixed numbers.
 - 1.3 Multiplication and division of fractions and mixed numbers.
 - 1.4 Combined operations involving addition, subtraction, multiplication, and division of fractions and mixed numbers.
 - 1.5 Solving word problems involving fractions and mixed numbers.

Core Concepts

Comparing fractions with unlike denominators requires making the denominators equal before comparing numerators. The fraction with the greater numerator will be the larger fraction.

Comparing mixed numbers starts with comparing the whole numbers; if they are equal, then compare the fractional parts.

Ordering fractions and mixed numbers involves pairwise comparison and arranging them from greatest to least or vice versa.

Adding or subtracting fractions with unlike denominators requires converting to equivalent fractions with common denominators before performing operations on numerators.

Adding or subtracting mixed numbers can be done by converting mixed numbers to improper fractions.

Multiplying a whole number by a fraction is done by multiplying the whole number by the numerator while keeping the denominator unchanged.

Multiplying fractions is done by multiplying the numerators together and the denominators together.

Multiplying mixed numbers requires converting them to improper fractions first.

The product remains unchanged if two fractions are multiplied in any order.

Any fraction multiplied by its reciprocal equals 1.

Dividing fractions is performed by multiplying the dividend by the reciprocal of the divisor.

Dividing mixed numbers requires converting them to improper fractions and then applying the same rule as dividing fractions.

Solving one-step word problems involves understanding the problem, planning a solution, executing the plan, and checking the result.

For multi-step calculations, the convention is:

Step 1: Calculate expressions in parentheses.

Step 2: Multiply or divide from left to right.

Step 3: Add or subtract from left to right.

Solving two-step word problems involving fractions follows the same problem-solving steps: understand the problem, plan the solution, implement the plan, and verify the result.

Core Competencies

1. Communication skills
2. Critical thinking skills
3. Problem-solving skills

Desirable Attributes

1. Discipline
2. Love of learning
3. Determination and perseverance in completing tasks

Tasks and Assignments

Tasks / Learning Products	Criteria / Assessment Points	Learning Activities
1. Worksheet: Comparing and Ordering Fractions and Mixed Numbers	Able to compare and order fractions and mixed numbers correctly.	Study the concept of comparing fractions and mixed numbers and demonstrate the method for finding solutions.
2. Worksheet: Finding the Sum of Fractions and Mixed Numbers	Able to find the sum of fractions and mixed numbers correctly.	Learn how to add fractions and mixed numbers and show the calculation process.
3. Worksheet: Finding the Difference of Fractions and Mixed Numbers	Able to find the difference of fractions and mixed numbers correctly.	Study the subtraction of fractions and mixed numbers and demonstrate the solution.

Tasks / Learning Products	Criteria / Assessment Points	Learning Activities
4. Worksheet: Finding the Product of Fractions and Mixed Numbers	Able to find the product of fractions and mixed numbers correctly.	Learn how to multiply fractions and mixed numbers and show the solution method.
5. Worksheet: Finding the Quotient of Fractions and Mixed Numbers	Able to find the quotient of fractions and mixed numbers correctly.	Study division of fractions and mixed numbers and present the solution method.
6. Worksheet: Solving One-Step Fraction Word Problems	Able to demonstrate methods for solving one-step fraction problems.	Learn how to solve one-step word problems involving addition, subtraction, multiplication, and division of fractions.
7. Worksheet: Solving Two-Step Fraction Problems	Able to find solutions for two-step fraction operations.	Study how to solve two-step fraction operations and present the solution.
8. Worksheet: Solving Two-Step Fraction Word Problems	Able to demonstrate methods for solving two-step fraction word problems.	Study and demonstrate methods for solving two-step word problems involving fractions.

Assessment Components

1. Knowledge: Achieve at least 60% score
2. Mathematical skills and processes: Achieve level 2 or higher
3. Desirable characteristics: Achieve level 2 or higher

Assessment Criteria:

Assessment Criteria	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Comparing and ordering fractions and mixed numbers	Students can compare and order fractions and mixed numbers with 80% accuracy or higher.	Students can compare and order fractions and mixed numbers with 70–79% accuracy.	Students can compare and order fractions and mixed numbers with 60–69% accuracy.	Students can compare and order fractions and mixed numbers with less than 60% accuracy.

Assessment Criteria	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
2. Finding the sum of fractions and mixed numbers	Students can find the sum of fractions and mixed numbers with 80% accuracy or higher.	Students can find the sum of fractions and mixed numbers with 70–79% accuracy.	Students can find the sum of fractions and mixed numbers with 60–69% accuracy.	Students can find the sum of fractions and mixed numbers with less than 60% accuracy.
3. Finding the difference of fractions and mixed numbers	Students can find the difference of fractions and mixed numbers with 80% accuracy or higher.	Students can find the difference of fractions and mixed numbers with 70–79% accuracy.	Students can find the difference of fractions and mixed numbers with 60–69% accuracy.	Students can find the difference of fractions and mixed numbers with less than 60% accuracy.
4. Finding the product of fractions and mixed numbers	Students can find the product of fractions and mixed numbers with 80% accuracy or higher.	Students can find the product of fractions and mixed numbers with 70–79% accuracy.	Students can find the product of fractions and mixed numbers with 60–69% accuracy.	Students can find the product of fractions and mixed numbers with less than 60% accuracy.
5. Finding the quotient of fractions and mixed numbers	Students can find the quotient of fractions and mixed numbers with 80% accuracy or higher.	Students can find the quotient of fractions and mixed numbers with 70–79% accuracy.	Students can find the quotient of fractions and mixed numbers with 60–69% accuracy.	Students can find the quotient of fractions and mixed numbers with less than 60% accuracy.
6. Showing solution steps for one-step word problems involving addition, subtraction, multiplication, or division of fractions	Students can show the solution steps for one-step word problems involving addition, subtraction, multiplication, or division of	Students can show the solution steps for one-step word problems involving addition, subtraction, multiplication, or division of	Students can show the solution steps for one-step word problems involving addition, subtraction,	Students can show the solution steps for one-step word problems involving addition, subtraction,

Assessment Criteria	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	fractions with 80% accuracy or higher.	fractions with 70–79% accuracy.	multiplication, or division of fractions with 60–69% accuracy.	multiplication, or division of fractions with less than 60% accuracy.
7. Solving two-step word problems involving addition, subtraction, multiplication, or division of fractions	Students can solve two-step word problems involving addition, subtraction, multiplication, or division of fractions with 80% accuracy or higher.	Students can solve two-step word problems involving addition, subtraction, multiplication, or division of fractions with 70–79% accuracy.	Students can solve two-step word problems involving addition, subtraction, multiplication, or division of fractions with 60–69% accuracy.	Students can solve two-step word problems involving addition, subtraction, multiplication, or division of fractions with less than 60% accuracy.
8. Showing solution steps for two-step word problems involving addition, subtraction, multiplication, or division of fractions	Students can show the solution steps for two-step word problems involving addition, subtraction, multiplication, or division of fractions with 80% accuracy or higher.	Students can show the solution steps for two-step word problems involving addition, subtraction, multiplication, or division of fractions with 70–79% accuracy.	Students can show the solution steps for two-step word problems involving addition, subtraction, multiplication, or division of fractions with 60–69% accuracy.	Students can show the solution steps for two-step word problems involving addition, subtraction, multiplication, or division of fractions with less than 60% accuracy.

Chapter 2

Mathematics (M15101)

Content: decimal places

Time 34 hours

Content and standard of learning

Standard M 1.1

Understanding the various representations of numbers, number systems, operations on numbers, the results and properties of operations, and the application of these concepts.

Grade level indicators

M 1.1 P.5/1: Write fractions with denominators that are factors of 10, 100, or 1,000 in decimal form.

M 1.1 P.5/6: Find the product of decimal numbers resulting in decimals with no more than three decimal places.

M 1.1 P.5/7: Find the quotient where the dividend is a whole number or a decimal with up to three decimal places and the divisor is a whole number; the quotient should be a decimal with no more than three decimal places.

M 1.1 P.5/8: Show methods for solving two-step word problems involving addition, subtraction, multiplication, and division of decimals.

M 2.1 P.5/1: Demonstrate how to solve word problems involving length with unit conversions expressed in decimal form.

M 2.1 P.5/2: Demonstrate how to solve word problems involving weight with unit conversions expressed in decimal form.

Learning Areas

- Decimals
 - Relationship between fractions and decimals.
 - Estimating decimals up to three decimal places to the nearest whole number, one decimal place, or two decimal places, using the “ $\approx$ ” symbol.
- Multiplication and Division of Decimals
 - Estimating results of addition, subtraction, multiplication, and division of decimals.
 - Multiplication of decimals.
 - Division of decimals.
 - Solving word problems involving decimals.
- Length
 - Relationships among units of length: centimeters and millimeters; meters and centimeters; kilometers and meters, using knowledge of decimals.
 - Solving word problems involving length by applying unit conversions and decimals.

- Weight
 - Relationships between units of weight: kilograms and grams, using knowledge of decimals.
 - Solving word problems involving weight by applying unit conversions and decimals.

Core Concepts

Whole numbers that are exact divisors of 10, 100, or 1,000 are factors of these numbers respectively. Fractions with denominators of 10, 100, or 1,000 can be expressed as decimals with one, two, or three decimal places accordingly.

To approximate, consider the digit to the right of the desired decimal place: if it is less than 5, drop all digits to its right; if it is 5 or greater, round up by one unit in the desired decimal place (0.1 or 0.01 as appropriate).

Multiplication of a decimal by a whole number follows the same method as multiplying whole numbers by distributing according to place value and summing the partial products.

The product of a whole number and a decimal with one decimal place will have one decimal place; two decimal places will yield two, and three will yield three.

Multiplication of decimals by decimals uses the same method as multiplying whole numbers, with the product having decimal places equal to the sum of the decimal places in the factors.

Division of a decimal by a whole number uses the same method as dividing whole numbers, moving from left to right digit by digit.

Relationships among units of measurement:

1 centimeter = 10 millimeters

1 meter = 100 centimeters

1 kilometer = 1,000 meters

1 kilogram = 1,000 grams

1 metric ton = 1,000 kilograms

Such relationships can be used to express lengths or weights in decimal form.

Solving word problems involving decimals up to two steps requires understanding the problem, planning, carrying out the plan, and checking the solution.

Core Competencies

1. Communication skills
2. Critical thinking skills
3. Problem-solving skills

Desirable Attributes

1. Discipline
2. Eagerness to learn
3. Diligence in work

Tasks and Assignments

Assignment	Key Assessment Points	Learning Activities
1. Worksheet on converting fractions with denominators that are factors of 10, 100, or 1,000 into decimals	Ability to write fractions with denominators that are factors of 10, 100, or 1,000 in decimal form	Study and practice converting fractions to decimals, showing calculation steps
2. Worksheet on estimating decimals up to three places	Ability to estimate decimals to whole numbers, one, or two decimal places	Study estimation methods and demonstrate calculation steps
3. Worksheet on finding products of decimals and whole numbers (resulting in decimals up to three places)	Ability to find such products accurately	Study and practice the method, showing steps clearly
4. Worksheet on multiplying decimals by decimals (resulting in decimals up to three places)	Ability to find such products accurately	Study and practice the method, showing steps clearly
5. Worksheet on dividing decimals (up to three decimal places) by whole numbers	Ability to find quotients with correct decimal places	Study and practice the method, showing steps clearly
6. Worksheet on dividing whole numbers resulting in decimals (up to three decimal places)	Ability to divide accurately and express quotients correctly	Study and practice, showing calculation steps
7. Worksheet on expressing relationships between units of length and weight using decimals	Ability to explain unit relationships using decimals	Study, memorize unit conversions, and apply decimals correctly
8. Worksheet on solving one-step word problems involving multiplication and division of decimals	Ability to analyze and solve such problems	Review problem-solving steps, study, and show solutions
9. Worksheet on solving two-step word problems involving addition, subtraction, multiplication, and division of decimals	Ability to analyze and solve two-step problems	Review one-step problem-solving, study, and show solutions

Assessment Components

1. Knowledge: Minimum score of 60%
2. Mathematical skills and processes: Minimum level 2 or above
3. Desirable characteristics: Minimum level 2 or above

Assessment Criteria:

Assessment Aspect	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Writing fractions with denominators that are factors of 10, 100, or 1,000 in decimal form	≥80% accuracy	70–79% accuracy	60–69% accuracy	<60% accuracy
2. Estimating decimals up to three decimal places	≥80% accuracy	70–79% accuracy	60–69% accuracy	<60% accuracy
3. Finding the product of decimals and whole numbers (up to three decimal places)	≥80% accuracy	70–79% accuracy	60–69% accuracy	<60% accuracy
4. Finding the product of decimals by decimals (up to three decimal places)	≥80% accuracy	70–79% accuracy	60–69% accuracy	<60% accuracy
5. Finding quotients where the dividend is a decimal (up to three decimal places) and the divisor is a whole number	≥80% accuracy	70–79% accuracy	60–69% accuracy	<60% accuracy
6. Finding quotients where both dividend and divisor are whole numbers, with a decimal quotient (up to three decimal places)	≥80% accuracy	70–79% accuracy	60–69% accuracy	<60% accuracy
7. Explaining the relationship between units of length and weight using decimals	≥80% accuracy	70–79% accuracy	60–69% accuracy	<60% accuracy
8. Analyzing and solving one-step word problems involving multiplication and division of decimals	≥80% accuracy	70–79% accuracy	60–69% accuracy	<60% accuracy
9. Analyzing and solving two-step word problems involving addition, subtraction, multiplication, and division of decimals	≥80% accuracy	70–79% accuracy	60–69% accuracy	<60% accuracy

Chapter 3

Mathematics (M15101)

Content: Presentation of Information

Time 12 hours

Content and standard of learning

Strand 3: Statistics and Probability

Standard M 3.1: Understand statistical processes and apply statistical knowledge to problem-solving.

Grade level indicators

GR. 3.1 P.5/1: Use data from line graphs to find solutions to word problems.

GR 3.1 P.5/2: Draw bar charts based on data expressed in whole numbers.

Learning Areas

- **Data Presentation**
 - Reading and drawing bar charts
 - Reading line graphs

Core Concepts

Abbreviating the scale on a number line is suitable for presenting data where each item has a large quantity or the quantities are approximately equal. A bar chart and a comparative bar chart are types of data presentation: a single bar chart presents one set of data, while a comparative bar chart presents two or more sets of data simultaneously.

When reading a bar chart with an abbreviated scale or a comparative bar chart, compare the end of each rectangle with the numbers on the scale. For comparative bar charts, also identify the symbols that differentiate each data set.

A line graph is another form of data presentation that uses straight lines to connect points, each representing a value of a particular item. Reading a line graph involves comparing the position of each point with the numbers on the scale. Line graphs are commonly used for data that changes continuously over time.

When drawing line graphs or bar charts, ensure equal spacing between data points. Solving problems using bar charts or line graphs may follow the problem-solving steps:

1. Understand the problem
2. Devise a plan
3. Carry out the plan
4. Review and check the result
- 5.

Assignments and Tasks

Assignment/Task	Evaluation Criteria	Learning Activities
1. Worksheet: Reading bar charts with abbreviated scales and comparative bar charts	Accurately read bar charts with abbreviated scales and comparative bar charts	Study and practice reading these types of charts
2. Worksheet: Drawing bar charts with abbreviated scales	Accurately draw bar charts with abbreviated scales	Review and practice drawing such charts
3. Worksheet: Drawing comparative bar charts	Accurately draw comparative bar charts	Study, practice, and draw based on given problems
4. Worksheet: Reading line graphs	Accurately read line graphs	Study and practice reading line graphs
5. Worksheet: Drawing line graphs	Accurately draw line graphs	Study and practice drawing line graphs
6. Worksheet: Using data from bar charts and line graphs to solve word problems	Correctly use data to solve word problems	Study and practice using data for problem-solving

Assessment Components

1. **Knowledge:** Minimum score of 60%
2. **Mathematical Skills and Processes:** Minimum level 2
3. **Desirable Characteristics:** Minimum level 2

Assessment Criteria:

Evaluation Aspect	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Reading bar charts with abbreviated scales and comparative bar charts	Students can read bar charts with abbreviated scales and comparative bar charts with an accuracy of 80% and above.	Students can read bar charts with abbreviated scales and comparative bar charts with an accuracy of 70–79%.	Students can read bar charts with abbreviated scales and comparative bar charts with an accuracy of 60–69%.	Students can read bar charts with abbreviated scales and comparative bar charts with an accuracy of less than 60%.
2. Drawing bar charts with abbreviated scales	Students can draw bar charts with abbreviated scales with an	Students can draw bar charts with abbreviated scales with an	Students can draw bar charts with abbreviated scales with an	Students can draw bar charts with abbreviated scales with an accuracy of less than 60%.

Evaluation Aspect	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	accuracy of 80% and above.	accuracy of 70–79%.	accuracy of 60–69%.	
3. Drawing comparative bar charts	Students can draw comparative bar charts with an accuracy of 80% and above.	Students can draw comparative bar charts with an accuracy of 70–79%.	Students can draw comparative bar charts with an accuracy of 60–69%.	Students can draw comparative bar charts with an accuracy of less than 60%.
4. Reading line graphs	Students can read line graphs with an accuracy of 80% and above.	Students can read line graphs with an accuracy of 70–79%.	Students can read line graphs with an accuracy of 60–69%.	Students can read line graphs with an accuracy of less than 60%.
5. Drawing line graphs	Students can draw line graphs with an accuracy of 80% and above.	Students can draw line graphs with an accuracy of 70–79%.	Students can draw line graphs with an accuracy of 60–69%.	Students can draw line graphs with an accuracy of less than 60%.
6. Using data from bar charts and line graphs to solve word problems	Students can use data from bar charts and line graphs to solve word problems with an accuracy of 80% and above.	Students can use data from bar charts and line graphs to solve word problems with an accuracy of 70–79%.	Students can use data from bar charts and line graphs to solve word problems with an accuracy of 60–69%.	Students can use data from bar charts and line graphs to solve word problems with an accuracy of less than 60%.

Chapter 4

Mathematics (M15101)

Content: Prohibited Truth

Time 9 hours

Content and standard of learning

Strand 1: Number and Algebra

Standard K 1.1:

Understand the diversity of number representations, number systems, numerical operations, results of operations, properties of operations, and their applications.

Grade level indicators

K 1.1 Grade 5/2: Demonstrate methods for solving word problems using the Rule of Three.

Learning Areas

- Natural numbers and zero; addition, subtraction, multiplication, and division
 - Solving word problems using the Rule of Three

Core Concepts

- Multiplication and division word problems express relationships between the quantities of two different items, each with two corresponding values.
- In problems where three quantities are given — two corresponding to one item and one corresponding to the other — it is possible to find the fourth quantity using the Rule of Three.
- Solving problems using the Rule of Three begins with understanding the problem, planning the solution, executing the plan, and verifying the result.
- The method for presenting solution steps using the Rule of Three may be:
 - Line 1: Write the relationship between the quantities of the two items as given in the problem, placing the unknown quantity on the right side.
 - Line 2: Find the value on the right side when the corresponding value on the left is set as one unit.
 - Line 3: Calculate the required value on the right side according to the problem's conditions.

Core Competencies

- Communication skills
- Critical thinking skills
- Problem-solving skills

Desirable Attributes

- Eagerness to learn
- Commitment to work

Assignments and Tasks

Assignment / Task	Criteria / Evaluation Points	Learning Activities
1. Worksheet on solving word problems using the Rule of Three	- Able to analyze and demonstrate methods to solve problems using the Rule of Three accurately	- Study the meaning, interpretation, and notation of percentages derived from fractions denominated by 100. - Study and discuss converting fractions with denominators that are multiples of 100 to percentages. - Study and analyze word problems involving multiplication and division (Rule of Three) and demonstrate solution methods.

Assessment Components

1. Knowledge: Achieve at least 60% score
2. Mathematical skills and processes: Achieve evaluation level 2 or higher
3. Desired attributes: Achieve evaluation level 2 or higher

Assessment Criteria:

Evaluation Aspect	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Analyzing and presenting the method for solving word problems using the Rule of Three	Students can analyze and present the method for solving word problems using the Rule of Three with an accuracy of 80% and above.	Students can analyze and present the method for solving word problems using the Rule of Three with an accuracy of 70–79%.	Students can analyze and present the method for solving word problems using the Rule of Three with an accuracy of 60–69%.	Students can analyze and present the method for solving word problems using the Rule of Three with an accuracy of less than 60%.

Chapter 5

Mathematics (M15101)

Content: percent

Time 17 hours

Content and standard of learning

Strand 1: Number and Algebra

Standard K 1.1:

Understand the diversity of number representations, number systems, numerical operations, resulting values, properties of operations, and their applications.

Grade level indicators

K 1.1 Grade 5/9: Demonstrate methods to solve percentage problems involving no more than two steps.

Learning Area

- Percentages
 - Reading and writing percentages
 - Solving percentage-related problems

Core Concepts

- Fractions having 100 as the denominator can be expressed in percentage form.
- A percentage can be represented as a fraction with denominator 100.
- To find the percentage of a natural number, express the percentage as a fraction over 100 and multiply by the number.
- Solving percentage problems begins by understanding the problem, planning the solution, executing the plan, and verifying the answer.
- Answers to percentage problems can be found by writing the percentage as a fraction or by using the rule of three.
- A price reduction expressed as a percentage represents the discount relative to the original price of 100 baht.
- Profit or loss expressed as a percentage represents the difference between a capital cost of 100 baht and the selling price.
- If the selling price exceeds the capital cost, there is a profit calculated as: Selling Price – Capital Cost.
- If the selling price is less than the capital cost, there is a loss calculated as: Capital Cost – Selling Price.
- If the selling price equals the capital cost, it is considered a break-even point.

Desirable Attributes

- Discipline
- Eagerness to learn
- Commitment to work

Assignments and Tasks

Assignment / Task	Criteria / Evaluation Points	Learning Activities
1. Worksheet on expressing quantities in percentage form	- Ability to express quantities as percentages accurately.	- Review converting fractions with denominator 100 into percentages. - Study and learn to express quantities as percentages.
2. Worksheet on calculating percentages of natural numbers	- Ability to calculate percentages of natural numbers.	- Study and practice calculating percentages of natural numbers, including explanation of procedures.
3. Worksheet on analyzing and demonstrating solutions to percentage problems	- Ability to analyze and demonstrate solution processes for percentage problems.	- Study and learn the steps to analyze percentage problems and demonstrate solution methods systematically.

Assessment Components

1. Knowledge: Achieve a score of at least 60%.
2. Mathematical skills and processes: Obtain evaluation results at Level 2 or higher.
3. Desired attributes: Obtain evaluation results at Level 2 or higher.

Assessment Criteria:

Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
1. Expressing quantities as percentages	Student can express quantities as percentages at 80% or above.	Student can express quantities as percentages between 70–79%.	Student can express quantities as percentages between 60–69%.	Student can express quantities as percentages below 60%.
2. Calculating percentages of natural numbers	Student can calculate percentages of natural numbers at 80% or above.	Student can calculate percentages between 70–79%.	Student can calculate percentages between 60–69%.	Student can calculate percentages below 60%.
3. Analyzing and demonstrating solutions to percentage problems	Student can analyze and demonstrate solution processes at 80% or above.	Student demonstrates solution process competence between 70–79%.	Student shows satisfactory solution process competence 60–69%.	Student has below 60% competency in analysis and demonstration of solutions.

Chapter 6

Mathematics (M15101)

Content: Parallel lines

Time 13 hours

Content and standard of learning

Strand 2: Measurement and Geometry

Standard K 2.2:

Understand and analyze geometric shapes, properties of geometric figures, relationships among geometric shapes, and geometric theorems, and apply them.

Grade level indicators

K 2.2 Grade 5/1: Construct a line or line segment parallel to a given line or line segment.

Learning Areas

- **Geometric Figures**
 - Perpendicular lines and their notation
 - Parallel lines and their notation
 - Construction of parallel lines, alternate angles, interior and exterior angles on the same side of a transversal line

Core Concepts

- Two lines in the same plane are parallel if they remain equidistant at all points.
- When a transversal line cuts two lines, if the alternate interior angles are equal, then the two lines are parallel.
- When a transversal cuts two lines, if the sum of interior angles on the same side of the transversal equals 180° , the two lines are parallel.
- To construct parallel lines with a specified distance apart, follow these steps:
 1. Draw one straight line.
 2. Mark two points on the line, and erect perpendiculars at these points of the given length.
 3. Draw a line passing through the endpoints of the two perpendiculars; this line will be parallel to the original line with the specified distance between them.
- To construct a line parallel to a given line passing through a point not on the line, there are three methods:
-

Method 1: Constructing with equal distance

1. Measure the shortest distance from the given point to the given line.
2. On the given line, select a point and erect a perpendicular at it with length equal to the measured distance, on the same side as the given point.
3. Draw a line through the given point and the endpoint of the perpendicular; this line is parallel to the given line.

Method 2: Constructing with equal alternate angles

4. Draw a line through the given point that intersects the given line.
5. At the given point (vertex), construct an alternate interior angle equal to the corresponding angle on the given line.
6. Draw another line through the given point along the arm of the constructed angle parallel to the original line.

Method 3: Constructing with interior angles on the same side summing to 180°

7. Draw a line through the given point intersecting the given line.
8. At the given point (vertex), construct interior angles on the same side of the transversal that sum to 180° .
9. Draw a line through the point along the arm of the angle parallel to the original line.
- 10.

Core Competencies

- Communication skills
- Reasoning skills
-

Desirable Attributes

- Discipline
- Eagerness to learn
- Commitment to work

Assignments and Tasks

Assignment / Task	Criteria / Evaluation Points	Learning Activities
1. Worksheet on perpendicular and parallel lines	- Identify pairs of parallel lines based on the distance between lines.	- Study and learn how to construct perpendicular and parallel lines using a protractor.
2. Worksheet on angles formed by a transversal intersecting a pair of lines	- Verify parallel lines by examining the equality of alternate interior angles.	- Study and learn about transversals, angles formed by transversals including alternate interior and exterior angles used to verify parallelism based on alternate angles.
3. Worksheet on properties of parallel lines	- Verify parallelism by examining the sum of interior angles on the same side of a transversal.	- Study and learn methods to verify parallel lines by measuring the sum of interior angles on the same side of a transversal using a protractor and a strip of paper.

Assignment / Task	Criteria / Evaluation Points	Learning Activities
4. Worksheet on constructing parallel lines at a specified distance	- Construct parallel lines with specified distance and through specified points.	- Study methods to construct parallel lines by the two methods, using a set square or protractor in combination with measurement tools.

Assessment Components

1. Knowledge: Achieve a score of at least 60%.
2. Mathematical skills and processes: Achieve level 2 or higher.
3. Desired attributes: Achieve level 2 or higher.

Assessment Criteria:

Evaluation Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
1. Identify pairs of lines that are parallel by considering the distance between the lines	Students correctly identify pairs of parallel lines by considering distance between lines at or above 80%.	Students identify pairs of parallel lines between 70–79%.	Students identify pairs of parallel lines between 60–69%.	Students identify pairs of parallel lines below 60%.
2. Verify parallel lines by consideration of alternate interior angles	Students correctly verify parallel lines by considering alternate interior angles at or above 80%.	Students verify parallel lines between 70–79%.	Students verify parallel lines between 60–69%.	Students verify parallel lines below 60%.
3. Verify parallel lines by considering the sum of interior angles on the same side of the transversal according to procedure	Students correctly verify parallel lines according to the angle sum procedure at or above 80%.	Students verify parallel lines between 70–79%.	Students verify parallel lines between 60–69%.	Students verify parallel lines below 60%.
4. Construct parallel lines with specified	Students construct parallel lines with specified distance	Students construct parallel lines	Students construct parallel lines	Students construct parallel

Evaluation Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
distance and passing through given points	and through specified points with at least 80% accuracy.	between 70–79% accuracy.	between 60–69% accuracy.	lines below 60% accuracy.

Chapter 7

Mathematics (M15101)

Time 24 hours

Content: Quadrilateral

Content and standard of learning

Strand 2: Measurement and Geometry

Standard K 2.1:

Understand the fundamentals of measurement; measure and estimate quantities and apply them.

Standard K 2.2:

Understand and analyze geometric shapes, properties of two-dimensional figures, relationships among geometric figures, and geometric theorems, and apply such knowledge.

Grade level indicators

- K 2.1 Grade 5/4: Demonstrate methods to solve problems related to the perimeter of quadrilaterals and the area of parallelograms and rhombuses.
- K 2.2 Grade 5/2: Classify quadrilaterals based on their properties.
- K 2.2 Grade 5/3: Construct various types of quadrilaterals when given side lengths and angles, or when given diagonal lengths.
-

Learning Areas

- **Two-dimensional Geometry**
 - Types and properties of quadrilaterals
 - Constructing quadrilaterals
- **Perimeter and Area**
 - Perimeter of quadrilaterals
 - Area of parallelograms and rhombuses
 - Solving problems involving the perimeter and area of parallelograms and rhombuses

Core Concepts

- **Square:** A quadrilateral with four right angles, all sides equal in length, pairs of opposite sides parallel, diagonals equal in length, bisecting each other at right angles.
- **Rectangle:** A quadrilateral with four right angles, opposite sides equal and parallel, adjacent sides unequal, diagonals equal in length and bisecting each other.
- **Rhombus:** A quadrilateral with no right angles, opposite angles equal, all sides equal in length, opposite sides parallel, diagonals bisecting each other perpendicularly.
- **Parallelogram:** A quadrilateral with opposite angles equal, opposite sides equal and parallel, diagonals bisecting each other.
- **Trapezoid:** A quadrilateral with exactly one pair of parallel sides.
- **Kite:** A quadrilateral with one pair of equal opposite angles, two pairs of adjacent equal sides, perpendicular diagonals, and only one diagonal bisected by the other.

- Constructing quadrilaterals requires understanding these properties, along with skills in measuring lengths and angles using tools such as protractors and compasses.
- **Area formulas:**
 - Area of parallelogram = base $\times$ height
 - Area of rhombus = base $\times$ height
- Problem solving involving perimeter and area is undertaken by following these steps:
 - Understand the problem
 - Plan a solution
 - Execute the plan
 - Verify the results

Core Competencies

- Communication skills
- Thinking skills
- Problem-solving skills

Desired Attributes

- Enthusiasm for learning
- Perseverance and dedication

Assignments and Tasks

Assignment / Task	Evaluation Criteria	Learning Activities
1. Worksheet on perpendicular and parallel lines	- Accurately identify pairs of parallel lines based on distance between them.	- Study and practice constructing perpendicular and parallel lines using a protractor.
2. Worksheet on angles formed by a transversal intersecting one pair of lines	- Verify parallelism by analyzing alternate interior angles.	- Study and learn about transversals and the angles they form (alternate interior, alternate exterior) that are used to verify parallelism.
3. Worksheet on properties of parallel lines	- Verify parallelism by analyzing the sum of interior angles on the same side of a transversal.	- Study and learn to verify parallel lines by measuring angle sums using protractors and paper strips.
4. Worksheet on constructing parallel lines with specified distances	- Construct parallel lines at given distances and through specified points accurately.	- Learn construction methods for parallel lines using set squares or protractors along with measuring tools.

Assessment Components

- Knowledge: Score at least 60%
- Mathematical skills and processes: Assessment at level 2 or higher
- Desired attributes: Assessment at level 2 or higher

Assessment Criteria:

Criterion	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
1. Identify pairs of parallel lines by considering distance between lines	Students identify pairs of parallel lines correctly at $\geq 80\%$ accuracy.	Students identify pairs of parallel lines at 70–79% accuracy.	Students identify pairs of parallel lines at 60–69% accuracy.	Students identify pairs of parallel lines below 60% accuracy.
2. Verify parallel lines by analyzing alternate interior angles	Students verify parallel lines by alternate interior angles correctly at $\geq 80\%$.	Students verify at 70–79%.	Students verify at 60–69%.	Students verify below 60%.
3. Verify parallelism by analyzing sum of interior angles on the same side	Students verify based on angle sums $\geq 80\%$.	Students verify at 70–79%.	Students verify at 60–69%.	Students verify below 60%.
4. Construct parallel lines at given distances and through given points	Students construct accurately at $\geq 80\%$.	Students construct at 70–79%.	Students construct at 60–69%.	Students construct below 60%.

Chapter 8

Mathematics (M15101)

Content: The volume and capacity of the rectangle

Time 17 hours

Content and standard of learning

Strand 2: Measurement and Geometry**Standard K 2.1:**

Understand the fundamentals of measurement; measure and estimate sizes of objects and apply this knowledge.

Standard K 2.2:

Understand and analyze geometric shapes, properties of geometric figures, relationships among geometric shapes, and geometric theorems, and apply such knowledge.

Grade level indicators

- K 2.1 Grade 5/3: Demonstrate methods to solve problems relating to the volume of rectangular prisms and the capacity of rectangular containers.
- K 2.2 Grade 5/4: Describe the characteristics of prisms.
-

Learning Area

- **Volume and Capacity**
 - Volume of rectangular prisms and capacity of rectangular containers
 - Relationships among milliliters, liters, cubic centimeters, and cubic meters
 - Problem solving involving volume of rectangular prisms and capacity of rectangular containers
- **Three-dimensional Geometry**
 - Characteristics and parts of prisms
 -

Core Concepts

- A prism is a solid three-dimensional geometric figure with two parallel and congruent polygonal bases. The lateral faces are parallelograms.
- Prisms are classified according to the shape of their bases.
- A rectangular prism is a prism all of whose faces are rectangles.
- A cube is a rectangular prism whose faces are all squares.
- A cube with side length 1 unit has a volume of 1 cubic unit.
- A cube with sides of 1 centimeter has a volume of 1 cubic centimeter.
- A cube with sides of 1 meter has a volume of 1 cubic meter.
- The volume of a rectangular prism can be calculated by:
- The capacity of a rectangular container corresponds to the volume of the space it encloses.
- Unit relationships:
 - 1 liter = 1,000 milliliters

- 1 liter = 1,000 cubic centimeters
- 1 cubic centimeter = 1 milliliter
- 1 cubic meter = 1,000 liters
- Problem solving involving volume and capacity should begin by understanding the problem, planning, executing, and verifying the solution.

-

Core Competencies

- Communication skills
- Critical thinking skills
- Problem-solving skills

-

Desired Attributes

- Discipline
- Eagerness to learn
- Perseverance and dedication

Assignments and Tasks

Assignment / Task	Criteria / Assessment Points	Learning Activities
1. Worksheet on characteristics and parts of prisms	- Ability to describe the characteristics and parts of prisms accurately	- Review two-dimensional and three-dimensional geometric figures. - Study the characteristics and parts of prisms. - Practice paper folding to create various three-dimensional shapes.
2. Worksheet on calculating volume and capacity of rectangular prisms	- Ability to calculate volume and capacity of rectangular prisms correctly	- Study the formulas for volume and capacity of rectangular prisms. - Practice calculating volume and capacity with demonstration of solution methods.
3. Worksheet on relationships among volume and capacity units	- Ability to describe relationships among units of volume and capacity	- Study and learn unit conversions and relationships between volume and capacity units.
4. Worksheet on solving problems involving volume and capacity of rectangular prisms	- Ability to solve volume and capacity problems for rectangular prisms correctly	- Study and practice solving word problems related to volume and capacity with systematic solution explanations.

Assessment Components

1. Knowledge: Achieve a minimum score of 60%.
2. Mathematical skills and processes: Achieve evaluation level 2 or higher.
3. Desired attributes: Achieve evaluation level 2 or higher.

Assessment Criteria:

Evaluation Criterion	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
1. Describe characteristics and parts of prisms	Student accurately describes characteristics and parts of prisms $\geq 80\%$	Student adequately describes at 70–79%	Student minimally describes at 60–69%	Student describes less than 60%
2. Calculate volume and capacity of rectangular prisms	Student correctly calculates $\geq 80\%$	Student calculates at 70–79%	Student calculates at 60–69%	Student calculates less than 60%
3. Describe relationships among units of volume/capacity	Student correctly describes relationships $\geq 80\%$	Student describes at 70–79%	Student describes at 60–69%	Student describes less than 60%
4. Solve problems on volume and capacity of rectangular prisms	Student correctly solves problems $\geq 80\%$	Student solves problems at 70–79%	Student solves problems at 60–69%	Student solves problems less than 60%

Grade 6 Unit Design Framework

Chapter 1

Mathematics (M16101)

Content: Greatest common divisor and Least common multiple

Time: 19 hours

Strand 1: Numbers and Algebra

Standard M1.1: Understand various representations of numbers, number systems, operations on numbers, the results and properties of operations, and apply them appropriately.

Grade level indicators

M1.1 Gr6/4 Find GCD greatest common divisor numbers not exceeding 3

M1.1 Gr6/5 Find LCM least common multiple numbers not exceeding 3

M1.1 Gr6/6 Analyse and show method of finding answers to problems G.C.D. And L.C.M

Learning Objective

Students will be taught to :

1. Factors, Prime Numbers, Prime Factors and Factorization.
2. G.C.D. greatest common divisor and L.C.M. least common multiple
3. Analyse and show method of finding answers to problems G.C.D. And L.C.M

Content

- The greatest common factor (LCM) of two or more numbers is the largest number that divides those numbers exactly.
- The least common multiple (LCM) of two or more numbers is the smallest number that is exactly divisible by those numbers.
- Solving problems using knowledge about LCM and GCF starts with understanding the problem, planning a solution, implementing the plan, and checking.
-

Key competencies of learners

- Thinking ability
- Problem solving ability
-

Desirable Characteristics:

- Eager to learn
- Committed to work

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Finding Factors and Factorization	- Find the factors of a whole number. Prime numbers, prime factors and factorization correctly according to the specified criteria.	- Study and learn to find the factors of prime numbers Prime factors and Factorization
2. Worksheet on Finding The Greatest Common Factor (GCD)	- Find the greatest common factor (GCD) of no more than 3 whole numbers correctly according to the specified criteria.	- Study and learn to find the lowest common factor (GCD) by finding the common factor by factoring and by dividing
3. Worksheet on finding the least common multiple (LCM)	- Find the least common factor (LCM) of no more than 3 whole numbers according to the specified criteria.	- Study and learn to find the least common multiple by finding the common product by factoring and by dividing
4. Worksheet on problems on finding the greatest common divisor (GCD) and finding the least common multiple (LCM)	- Show how to find the answer to the problem using knowledge about the greatest common factor (GCD) and the least common multiple (LCM) correctly according to the specified criteria.	- Study and learn to find the answer to the problem of finding the greatest common divisor (GCD) and finding the least common multiple (LCM).

Assessment Includes:

1. Knowledge: Students must score at least 60 percent up.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or above.
3. Desirable Characteristics: Assessment result must be at Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Find the factors of a whole number Prime numbers Prime factors and factorization	Students can be able find factors of whole numbers, prime numbers, prime factors, and factorization at 80% or more.	Students can be able find factors of whole numbers, prime numbers, prime factors, and factorization at 70-79%	Students can be able find factors of whole numbers, prime numbers, prime factors, and factorization at 60-69%	Students can be able find factors of whole numbers, prime numbers, prime factors, and factorization less than 60%
2. Finding the greatest common factor (GCD) of no more than 3 integers	Students can be able to find the greatest common factor (LCM) of no more than 3 whole numbers at 80% or more.	Students can be able to find the greatest common factor (LCM) of no more than 3 whole numbers at 70-79%	Students can be able to find the greatest common factor (LCM) of no more than 3 whole numbers at 60-69%	Students can be able to find the greatest common factor (LCM) of no more than 3 whole numbers less than 60%.
3. Finding the least common factor (LCM) of no more than 3 whole numbers	Students can be able to find the least common factor (LCM) of no more than 3 whole numbers at 80% or more.	Students can be able to find the least common factor (LCM) of no more than 3 whole numbers at 70-79%	Students can be able to find the least common factor (LCM) of no more than 3 whole numbers at 60-69%	Students can be able to find the least common factor (LCM) of no more than 3 whole numbers less than 60%.
4. Shows how to find the answer to a problem using knowledge about greatest common divisor (GCD) and least common multiple (LCM).	Students can be able to find the answer to a problem using knowledge about greatest common divisor (GCD) and least common multiple (LCM) at 80% or more.	Students can be able to find the answer to a problem using knowledge about greatest common divisor (GCD) and least common multiple (LCM) at 70-79%	Students can be able to find the answer to a problem using knowledge about greatest common divisor (GCD) and least common multiple (LCM) at 60-69%	Students can be able to find the answer to a problem using knowledge about greatest common divisor (GCD) and least common multiple (LCM) less than 60%.

Chapter 2

Mathematics (M16101)

Content: Fraction

Time: 17 hours

Strand 1: Numbers and Algebra

Standard M1.1: Understand various representations of numbers, number systems, operations on numbers, the results and properties of operations, and apply them appropriately.

Grade level indicators

M1.1 Gr6/1 Compare and order fractions and mixed numbers from different situations.

M1.1 Gr6/7 Find the results of mixed addition, subtraction, multiplication and division of fractions and mixed numbers.

M1.1 Gr6/8 Shows how to find the answer to fraction and mixed number problems in 2-3 steps.

Learning Objective

Students will be taught to :

1. Comparing and ordering fractions and mixed numbers using knowledge of least common multiples.
2. Adding and subtracting fractions and mixed numbers using knowledge of least common multiples.
3. Mixed addition, subtraction, multiplication and division of fractions and mixed numbers

Content

- Comparing fractions with different denominators, you must first make the denominators the same, perhaps by making them equal to the least common multiple of the denominators, and then compare them.
- Comparing mixed numbers, first compare the whole numbers of the mixed numbers. If the whole numbers are equal, then compare the fractions.
- Comparing fractions to mixed numbers, you can either write the mixed numbers as improper fractions or write the improper fractions as mixed numbers and then compare them.
- Adding or subtract fractions with different denominators, you must first make the denominators the same, perhaps by making the least common multiple of the denominators equal, and then find the sum or difference.
- Adding mixed numbers can be done by adding whole numbers to whole numbers and fractions to fractions. If the sum of the fractions is an improper fraction, make it a mixed number and then add the whole numbers of the mixed number to the sum of the whole numbers.
- Mixing numbers can be subtracted by subtracting whole numbers from whole numbers, and fractions from fractions. If the minuend is smaller than the subtracted fraction,

distribute the difference of the whole numbers by 1, write it as a fraction, add the minuend to the minuend, and then find the difference.

- Adding and subtracting mixed numbers. Mixed numbers can be written as improper fractions and then the sum or subtraction is found. Conventions on the order of computations with more than one step.

Step 1: Calculate in parentheses (if any).

Step 2: Multiply or divide, calculating from left to right.

Step 3: Add or subtract, calculating from left to right.

Solving problems involving addition, subtraction, multiplication, and division of fractions and mixed numbers in 2-3 steps: Start by understanding the problem, planning a solution, following the plan, and checking.

Key competencies of learners

- Thinking ability
- Problem solving ability

Desirable Characteristics:

- Disciplined
- Eager to learn

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Comparing and Ordering Fractions	- Compare and sort fractions and mixed numbers from different situations correctly according to the specified criteria.	- Brainstorming, finding ways summary of methods for comparing and ordering fractions
2. Worksheet on Addition Subtraction of fractions and Mixed numbers	- Find the sum and difference of fractions and mixed numbers correctly according to the specified criteria.	- Study and learn by doing addition, subtraction, fractions and mixed numbers from the diagram.
3. Worksheet on mixed addition, subtraction, multiplication and division of fractions and mixed numbers	- Find the results of the mixed addition, subtraction, multiplication and division of fractions and mixed numbers correctly according to the specified criteria	- Study, learn, discuss together Add, subtract, multiply, and divide mixed fractions and mixed numbers
4. Worksheet on Addition, Subtraction, Multiplication	- Shows how to find the answer to fraction and mixed number problems in 2-3 steps	- Collaborative analysis of problems and demonstrating

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
Division and Mixed Addition, Subtraction, Multiplication and Division of Fractions and Mixed Numbers	Correctly according to the specified criteria	how to solve them to find the answers of problems involving addition, subtraction, multiplication, division, and mixed addition, subtraction, multiplication, and division of fractions and mixed numbers

Assessment Includes:

1. Knowledge: Students must score at least 60 percent up.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or above.
3. Desirable Characteristics: Assessment result must be at Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Comparing and sort fractions and mixed numbers in different situations.	Students can be able to comparing and sort fractions and mixed numbers in different situations at 80% or more.	Students can be able to comparing and sort fractions and mixed numbers in different situations at 70-79%	Students can be able to comparing and sort fractions and mixed numbers in different situations at 60-69%	Students can be able to comparing and sort fractions and mixed numbers in different situations less than 60%
2. Finding the sum and difference of fractions and mixed numbers	Students can be able to find the sum and difference of fractions and mixed numbers at 80% or more.	Students can be able to find the sum and difference of fractions and mixed numbers at 70-79%	Students can be able to find the sum and difference of fractions and mixed numbers at 60-69%	Students can be able to find the sum and difference of fractions and mixed numbers less than 60%.
3. Finding the results of mixed addition,	Students can be able to find the results of mixed	Students can be able to find the results of mixed	Students can be able to find the results of mixed	Students can be able to find the results of mixed

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
subtraction, multiplication, and division of fractions and mixed numbers	addition, subtraction, multiplication, and division of fractions and mixed numbers at 80% or more.	addition, subtraction, multiplication, and division of fractions and mixed numbers at 70-79%	addition, subtraction, multiplication, and division of fractions and mixed numbers at 60-69%	addition, subtraction, multiplication, and division of fractions and mixed numbers less than 60%.
4.Show how to find the answer to fraction and mixed number problems 2 – 3 steps	Students can be able to Show how to find the answer to fraction and mixed number problems 2 – 3 steps at 80% or more.	Students can be able to Show how to find the answer to fraction and mixed number problems 2 – 3 steps at 70-79%	Students can be able to Show how to find the answer to fraction and mixed number problems 2 – 3 steps at 60-69%	Students can be able to Show how to find the answer to fraction and mixed number problems 2 – 3 steps less than 60%.

Chapter 3

Mathematics (M16101)

Content: Decimal

Time: 15 hours

Strand 1: Numbers and Algebra

Standard M1.1: Understand various representations of numbers, number systems, operations on numbers, the results and properties of operations, and apply them appropriately.

Grade level indicators

M1.1 Gr6/9 Find the quotient of decimals where the divisor and quotient are not more than 3 decimal places.

M1.1 Gr6/10 Shows how to find the answer to a three-step problem involving addition, subtraction, multiplication and division of decimals.

Learning Objective

Students will be taught to :

1. Find the relationship between fractions and decimals
2. Show the division of decimals
3. Solve problems involving decimals (including foreign exchange)

Content

- Division of decimals or whole numbers by decimals with no more than 3 decimal places can be done by writing the decimal as a fraction and finding the quotient, then writing the quotient as a decimal, making the divisor a whole number by multiplying both the numerator and the divisor by 10, 100 or 1,000, and then finding the quotient
- Solving problems involving addition, subtraction, multiplication, and division of decimals in 3 steps: Start by understanding the problem, planning a solution, executing the plan, and checking.

Key competencies of learners

- Thinking ability
- Problem solving ability

Desirable Characteristics:

- Disciplined
- Eager to learn

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on writing fractions in decimal form.	- Write decimals as fractions and Write fractions as decimals correctly according to the specified criteria.	- Writing decimals as fractions and writing fractions as decimals
2. Worksheet on dividing decimals	- Find the quotient of decimals where the divisor and quotient are not more than 3 decimal places correctly according to the specified criteria.	- Division of fractions by fractions division of whole numbers by fractions and division of decimals by whole numbers
3. Worksheet on currency exchange	- Able to exchange currency in accordance with the specified criteria	- Applying knowledge of multiplication and division of decimals to real life. Consider currency exchange. Insert related words in currency exchange. And introduce other popular currencies.
4. Worksheet on Decimal Division Problems	- Shows how to find the answer to a three-step problem involving addition, subtraction, multiplication, and division of decimals, correctly according to the specified criteria.	- Analyze the given decimal problem and the generated decimal problem. Write a symbolic sentence. Show the solution to find the answer and be aware of the reasonableness of the answer obtained.

Assessment Includes:

1. Knowledge: Students must score at least 60 percent up.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or above.
3. Desirable Characteristics: Assessment result must be at Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Writing decimals as fractions and writing fractions in decimal form.	Students can be able to Write decimals as fractions and writing fractions in decimal form at 80% or more.	Students can be able to Write decimals as fractions and writing fractions in decimal form at 70-79%	Students can be able to Write decimals as fractions and writing fractions in decimal form at 60-69%	Students can be able to Write decimals as fractions and writing fractions in decimal form less than 60%
2. Finding the quotient of decimals where the divisor and quotient are decimals with no more than 3 decimal places	Students can be able to find the quotient of decimals where the divisor and quotient are decimals with no more than 3 decimal places at 80% or more.	Students can be able to find the quotient of decimals where the divisor and quotient are decimals with no more than 3 decimal places at 70-79%	Students can be able to find the quotient of decimals where the divisor and quotient are decimals with no more than 3 decimal places at 60-69%	Students can be able to find the quotient of decimals where the divisor and quotient are decimals with no more than 3 decimal places less than 60%.
3. Currency exchange	Students can be able to exchange Currency at 80% or more.	Students can be able to exchange Currency at 70-79%	Students can be able to exchange Currency at 60-69%	Students can be able to exchange Currency less than 60%.
4. Shows how to find the answer to a three-step problem involving addition, subtraction, multiplication, and division of decimals.	Students can be able to Shows how to find the answer to a three-step problem involving addition, subtraction, multiplication, and division of	Students can be able to Shows how to find the answer to a three-step problem involving addition, subtraction, multiplication, and division of	Students can be able to Shows how to find the answer to a three-step problem involving addition, subtraction, multiplication, and division of	Students can be able to Shows how to find the answer to a three-step problem involving addition, subtraction, multiplication, and division of

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	decimals. at 80% or more.	decimals at 70-79%	decimals at 60-69%	decimals less than 60%.

Chapter 4

Mathematics (M16101)

Content: Percentage and ratio

Time: 20 hours

Strand 1: Numbers and Algebra

Standard M1.1: Understand various representations of numbers, number systems, operations on numbers, the results and properties of operations, and apply them appropriately.

Grade level indicators

M1.1 Gr6/2 Write a ratio to compare two quantities from a text or situation, where each quantity is a counting number.

M1.1 Gr6/3 Find the ratio that is equal to the given ratio.

M1.1 Gr6/11 Show how to find the answer to a ratio problem.

M1.1 Gr6/12 Shows how to find the answer to a percentage problem in 2 - 3 steps.

Learning Objective

Students will be taught to :

1. Write Ratio, Equivalent Ratio, and Scale
2. Solve Ratio and Scale Problems
3. Solve Percentage Problems

Content

- Solving percentage problems starts with understanding the problem, planning the solution, implementing the plan, and checking.
- A relationship that shows a comparison of two or more quantities, which may have the same or different units, is called a ratio.
- Writing a comparison of quantities in the form of a ratio, if the units are the same, it is not common to write the units. If the units are different, the units will be written.
- Finding a ratio that is equal to a given ratio, either multiply each number in the ratio by the same number greater than 1 or divide each number in the ratio by the same number greater than 1.
- Solving problems about ratios and scales starts with understanding the problem, planning the solution, implementing the plan and checking.

Key competencies of learners

- Thinking ability
- Ability to use life skills
- Communication skills

Desirable Characteristics:

- Eager to learn
- Be honest
- Committed to work

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Problems with percentages	- Solve percentage problems in 2-3 steps correctly according to the specified criteria.	- Review knowledge about finding percentages or percentages. Teach problem solving. Percentage or percentage 1 Step Analyze the problem. Understand what the problem is asking and what the problem says to connect to finding the answer using the rule of three. - Teach percentage problems or percentages 2-3 steps, analyze the problem, understand what the problem is asking and what the problem says to connect to finding the answer using the rule of three.
2. Worksheet on Ratio and Scale	- Write a ratio to compare two quantities and find the ratio that is equal to the specified ratio correctly according to the specified criteria.	- Use short real-life situations to introduce the conversation to learn about ratios, comparing two quantities, and finding the ratio that is equal to a given ratio.
3. Worksheet on Problems about ratios and scales	- Solve ratio and scale problems correctly according to the specified criteria.	Review ratios that are equal to the given ratios. Use problem situations about ratios and scales. To train students to think systematically. Use the relationship between multiplication and division to get the same ratios. division of decimals to real life.

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
		Consider currency exchange. Insert related words in currency exchange. And introduce other popular currencies.

Assessment Includes:

1. Knowledge: Students must score at least 60 percent up.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or above.
3. Desirable Characteristics: Assessment result must be at Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1 Solving Percentage Problems in 2-3 Steps	Students can be able to solving Percentage Problems in 2-3 Steps at 80% or more.	Students can be able to solving Percentage Problems in 2-3 Steps at 70-79%	Students can be able to solving Percentage Problems in 2-3 Steps at 60-69%	Students can be able to solving Percentage Problems in 2-3 Steps less than 60%
2. Write a ratio to compare 2 quantities and find the ratio that is equal to the given ratio.	Students can be able to write a ratio to compare 2 quantities and find the ratio that is equal to the given ratio at 80% or more.	Students can be able to write a ratio to compare 2 quantities and find the ratio that is equal to the given ratio at 70-79%	Students can be able to write a ratio to compare 2 quantities and find the ratio that is equal to the given ratio at 60-69%	Students can be able to write a ratio to compare 2 quantities and find the ratio that is equal to the given ratio less than 60%.
3. Solve problems involving ratios and scales.	Students can be able to solve problems	Students can be able to solve problems involving ratios	Students can be able to solve problems involving ratios	Students can be able to solve problems

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	involving ratios and scales at 80% or more.	and scales at 70-79%	and scales at 60-69%	involving ratios and scales less than 60%.

Chapter 5

Mathematics (M16101)

Content: Mathematical pattern

Time: 9 hours

Strand 1: Numbers and Algebra

Standard M1.2: Understand and analyze patterns, relations, functions, sequences, and series, and apply them.

Grade level indicators

M1.2 Gr6/1 Show how to think and find answers to problems about patterns.

Learning Objective

Students will be taught to :

1. Solve problems with patterns

Content

- A pattern is a relationship that shows common characteristics of a set of numbers, geometric shapes, or other things.
- Solving problems with patterns Start by understanding the problem. Find the numbers or things that are related to each other in the pattern. Consider the relationships in the pattern to lead to what the problem requires.

Key competencies of learners

- Ability to use life skills
- Communication skills

Desirable Characteristics:

- Disciplined
- Eager to learn
- Committed to work

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Patterns and relationships	- Tell the relationship of numbers or geometric shapes in the form correctly according to the specified criteria.	- Finding the relationship of numbers in the pattern Consider the Fibonacci numbers.

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
		Consider together how to arrange the glasses. It is recommended to write the numbers to show the numbers to help observe the relationships that occur.
2. Worksheet on Solving problems with patterns	- Solve problems with the form correctly according to the specified criteria.	- Consider the problem situation together by drawing illustrations to help identify the relationship more easily. - Analyze the relationship between the numbers that occur in relation to the pattern.

Assessment Includes:

1. Knowledge: Students must score at least 60 percent up.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or above.
3. Desirable Characteristics: Assessment result must be at Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1 Tell the relationship of numbers or geometric shapes in a diagram	Students can be able to tell the relationship of numbers or geometric shapes in a diagram at 80% or more.	Students can be able to tell the relationship of numbers or geometric shapes in a diagram at 70-79%	Students can be able to tell the relationship of numbers or geometric shapes in a diagram at 60-69%	Students can be able to Tell the relationship of numbers or geometric shapes in a diagram less than 60%
2. Solving problems with patterns	Students can be able to Solve problems with patterns at 80% or more.	Students can be able to Solve problems with patterns at 70-79%	Students can be able to Solve problems with patterns at 60-69%	Students can be able to Solve problems with patterns less than 60%.

Chapter 6

Mathematics (M16101)

Content: Triangle

Time: 20 hours

Strand 2: Measurement and Geometry

Standard M2.2: Understand and analyze geometric figures, their properties, relationships among.

Grade level indicators

M2.2 Gr6/1 Classify triangles based on their properties.

M2.2 Gr6/2 Construct a triangle given the length of the sides and the measure of the angles.

Learning Objective

Students will be taught to :

1. Know types and properties of triangles.
2. Know interior angles of a polygon.
3. Make triangle formation.
4. Write perimeter and area of polygons.
5. Solve problems about the perimeter and area of polygons.

Content

- Types of triangles classified by the size of the angles are acute triangles, right triangles, and obtuse triangles. A triangle with all the angles being acute is called a right triangle. A triangle with 1 obtuse angle is called an obtuse triangle.
- Types of triangles are classified according to the length of the sides into equilateral triangles, isosceles triangles and equilateral triangles. A triangle that has all sides of equal length is called an equilateral triangle. A triangle that has two sides of equal length is called an equilateral triangle. A triangle with sides of different lengths is called an isosceles triangle, and a triangle with sides of different lengths is called an isosceles triangle.
- Triangle construction is the construction of a triangle based on the characteristics or properties of each type of triangle, which requires skills in measuring length, measuring angles, and constructing angles using geometric tools.
- Solving problems about the perimeter and area of a triangle can use the following
 - Step 1 Understand the problem
 - Step 2 Plan a solution
 - Step 3 Execute the plan
 - Step 4 Check

Key competencies of learners

- Communication ability
- Ability to use life skills
- Ability to use technology

Desirable Characteristics:

- Disciplined
- Live simply
- Committed to work

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Types and properties of triangles	- Tell the type and properties of triangles correctly according to the specified criteria.	- Review the characteristics of triangles, introduce the definition and naming of triangles. - Classification of triangles based on the size of their angles. - Classification of triangles based on side lengths
2. Worksheet on Parts of a triangle	- State the parts of a triangle correctly according to the specified criteria	- Introduce the base, base angle, vertex angle and the sides supplementing the vertex angle of a triangle using a piece of paper cut into a triangle to illustrate the explanation.
3. Worksheet on Creation Triangle	- Create a triangle according to the specifications Correctly	- Review the characteristics of each type of triangle and how to use a compass. - Analyze what the problem requires and What the problem specifies, draw a rough shape according to the requirements, then plan and organize the steps to create a triangle together.
4. Worksheet on the circumference of triangles	- Find the perimeter of a triangle correctly according to the specified criteria.	- Review finding the perimeter of a quadrilateral, then consider finding the

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
		perimeter of a triangle together.
5. Worksheet on Area of Triangles	- Find the area of a triangle correctly according to the specified criteria.	- Review finding the area of a parallelogram, then do an activity finding the area of a triangle.
6. Worksheet on Triangle Problems	- Shows how to find the answer to problems about the area and perimeter of a triangle.	- tell what the question asks and what the question says from the situation of the problem about the area and the perimeter of a triangle to lead to planning and finding the answer.

Assessment Includes:

1. Knowledge: Students must score at least 60 percent up.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or above.
3. Desirable Characteristics: Assessment result must be at Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Tell the types and properties of triangles	Students can be able to Tell the types and properties of triangles at 80% or more.	Students can be able to Tell the types and properties of triangles at 70-79%	Students can be able to Tell the types and properties of triangles at 60-69%	Students can be able to Tell the types and properties of triangles less than 60%
2. State the parts of a triangle.	Students can be able to State the parts of a triangle at 80% or more.	Students can be able to state the parts of a triangle at 70-79%	Students can be able to state the parts of a triangle at 60-69%	Students can be able to state the parts of a triangle less than 60%.

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
3. Create a triangle according to the specifications.	Students can be able to Create a triangle according to the specifications at 80% or more.	Students can be able to Create a triangle according to the specifications at 70-79%	Students can be able to Create a triangle according to the specifications at 60-69%	Students can be able to Create a triangle according to the specifications less than 60%.
4. Find the perimeter of a triangle.	Students can be able to find the perimeter of a triangle at 80% or more.	Students can be able to find the perimeter of a triangle at 70-79%	Students can be able to find the perimeter of a triangle at 60-69%	Students can be able to find the perimeter of a triangle less than 60%.
5. Find the area of a triangle.	Students can be able to find the area of a triangle at 80% or more.	Students can be able to find the area of a triangle at 70-79%	Students can be able to find the area of a triangle at 60-69%	Students can be able to find the area of a triangle less than 60%.
6. Shows how to find the answer to problems about the area and perimeter of a triangle.	Students can be able to shows how to find the answer to problems about the area and perimeter of a triangle at 80% or more.	Students can be able to shows how to find the answer to problems about the area and perimeter of a triangle at 70-79%	Students can be able to shows how to find the answer to problems about the area and perimeter of a triangle at 60-69%	Students can be able to shows how to find the answer to problems about the area and perimeter of a triangle less than 60%.

Chapter 7

Mathematics (M16101)

Content: Polygon

Time: 17 hours

Strand 2: Measurement and Geometry

Standard M2.1: Understand measurement fundamentals; measure and estimate the size of objects, and apply such knowledge.

Grade level indicators

M2.1 Gr6/2 Shows how to find the answer to a problem about the perimeter and area of a polygon.

Learning Objective

Students will be taught to :

1. Know Interior angles of a polygon.
2. Know Perimeter and area of polygons.
3. Solve problems about the perimeter and area of polygons Write perimeter and area of polygons.

Content

- A polygon is a closed figure on a plane, with all sides being line segments.
Classification of polygons based on the number of sides of the figure.
- A regular polygon is a polygon in which all sides are of equal length and all angles are of equal measure.
- To find the sum of the interior angles of a polygon, add the measures of all the interior angles or divide the polygon into non-overlapping triangles and multiply the number of triangles divided by 180
- To find the area of a polygon, divide the polygon into triangles and squares, find the area of each, and then add up the total area.
- Solving problems about perimeter and area of polygons starts with understanding the problem, planning the solution, executing the plan and checking.

Key competencies of learners

- Communication ability
- Ability to use life skills
- Ability to use technology

Desirable Characteristics:

- Disciplined
- Live simply
- Committed to work

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Characteristics of polygons	- Describe the characteristics of polygons correctly and completely	- Review the differences between closed and open shapes by drawing a diagram. Description Then, consider the characteristics of polygons together.
2. Worksheet on Interior angles of a polygon	- Find the sum of the measures of the interior angles of a polygon according to the specified criteria.	- Find the sum of the measures of the interior angles of a polygon using a protractor. Measure the measures of all the angles and add them together.
3. Worksheet on Perimeter of a polygon	- Show how to find the perimeter of a polygon correctly.	- Shows how to find the perimeter of a polygon by adding together the lengths of all its sides.
4. Worksheet on Area of Polygon	- Shows how to correctly find the area of a polygon.	- Review the characteristics of trapezoids, introduce parallel sides and heights, and demonstrate together how to find the area of a polygon.
5. Worksheet on Polygon Problems	- Show how to find the correct answer to problems about the perimeter of a polygon and the area of a polygon.	- Consider and plan together to solve problems about the perimeter of a polygon and find the area of a polygon and draw a rough sketch to support the planning.

Assessment Includes:

1. Knowledge: Students must score at least 60 percent up.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or above.
3. Desirable Characteristics: Assessment result must be at Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Describe the characteristics of polygons.	Students can be able to describe the characteristics of polygons at 80% or more.	Students can be able to describe the characteristics of polygons at 70-79%	Students can be able to .describe the characteristics of polygons at 60-69%	Students can be able to describe the characteristics of polygons less than 60%
2. Find the sum of the measures of the interior angles of a polygon.	Students can be able to find the sum of the measures of the interior angles of a polygon at 80% or more.	Students can be able to find the sum of the measures of the interior angles of a polygon at 70-79%	Students can be able to find the sum of the measures of the interior angles of a polygon at 60-69%	Students can be able to find the sum of the measures of the interior angles of a polygon less than 60%.
3. Shows how to find the perimeter of a polygon.	Students can be able to shows how to find the perimeter of a polygon at 80% or more.	Students can be able to shows how to find the perimeter of a polygon at 70-79%	Students can be able to shows how to find the perimeter of a polygon at 60-69%	Students can be able to shows how to find the perimeter of a polygon less than 60%.
4. Shows how to find the area of a polygon.	Students can be able to shows how to find the area of a polygon at 80% or more.	Students can be able to shows how to find the area of a polygon at 70-79%	Students can be able to shows how to find the area of a polygon at 60-69%	Students can be able to shows how to find the area of a polygon less than 60%.
5. Show how to find the answer to problems about	Students can be able show how to find the answer to problems about	Students can be able show how to find the answer to problems about	Students can be able show how to find the answer to problems about	Students can be able show how to find the answer to problems about

Assessment Item	Assessment Criteria			
	excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
the perimeter of a polygon and the area of a polygon..	the perimeter of a polygon and the area of a polygon at 80% or more.	the perimeter of a polygon and the area of a polygon at 70-79%	the perimeter of a polygon and the area of a polygon at 60-69%	the perimeter of a polygon and the area of a polygon less than 60%.

Chapter 8

Mathematics (M16101)

Content: Circle

Time: 20 hours

Standard M2.1: Understand measurement fundamentals; measure and estimate the size of objects, and apply such knowledge.

Grade level indicators

M2.1 Gr6/3 Shows how to find the answer to problems about the circumference and area of a circle.

Learning Objective

Students will be taught to :

1. Know parts of a circle Know Perimeter and area of polygons.
2. Create a circle.
3. Know circumference and area of a circle.
4. Solve problems about circumference and area of circles.

Content

- A circle is a closed figure in a plane in which every point on the curve is the same distance from a fixed point. This point is the center of the circle. The closed curve that forms the edge of the circle is called the circumference.
- A line segment that passes through the center and has two endpoints on the circumference is called the diameter.
- The distance between the center and any point on the circumference is called the radius in a circle, there can be many diameters, each of equal length.
- To construct a circle using a compass, we must define the center and the radius of the circle. When we divide the circumference by the diameter of the same circle, we get a constant value of approximately 3.14. Replace this constant with π .
- Area of a circle = πr^2 where r represents the length of the radius solving problems about the circumference and area of a circle starts with understanding the problem, planning how to solve it, implementing the plan and checking.

Key competencies of learners

- Communication ability
- Ability to use life skills
- Ability to use technology

Desirable Characteristics:

- Disciplined
- Live simply
- Committed to work

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Parts of a circle	- Correctly identify the parts of a circle.	- Activity to learn about parts of a circle by drawing a curve around the edge of an object that has a circle as a component on paper. Then explore the length and number of radii of the circle.
2. Worksheet on creating a circle	- Create a circle as specified.	- Creating circles with paper strips and creating circles using a compass.
3. Worksheet on Length of circumference	- Find the correct length of the circumference.	- Finding the circumference length and analyzing the relationship between the circumference length and the diameter length.
4. Worksheet on area of circle	- Find the correct area of the circle.	- Find the area of a circle and consider the relationship between the area of a circle and the area of a rectangle, and the relationship between the length of the radius of the circle and the width of the rectangle, and the length of the circumference and the length of the rectangle.
5. Worksheet on Problems about the length of circumference and area of circles	- Shows how to find the correct answer to problems about the circumference and area of a circle.	- Shows how to find the answer to a problem about the circumference and area of a circle in a given situation.

Assessment Includes:

1. Knowledge: Students must score at least 60 percent up.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or above.
3. Desirable Characteristics: Assessment result must be at Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Tell the parts of a circle	Students can be able to tell the parts of a circle at 80% or more.	Students can be able to tell the parts of a circle at 70-79%	Students can be able to tell the parts of a circle at 60-69%	Students can be able to tell the parts of a circle less than 60%
2. Creating a circle	Students can be able to create a circle at 80% or more.	Students can be able to create a circle at 70-79%	Students can be able to create at 60-69%	Students can be able to create less than 60%.
3. Find the length of circumference	Students can be able to find the length of circumference at 80% or more.	Students can be able to find the length of circumference at 70-79%	Students can be able to find the length of circumference at 60-69%	Students can be able to find the length of circumference less than 60%.
4. Find the area of circle	Students can be able to find the area of circle at 80% or more.	Students can be able to find the area of circle at 70-79%	Students can be able to find the area of circle at 60-69%	Students can be able to find the area of circle less than 60%.
5. Solve problems about the length of circumference and area of circles	Students can be able to solve problems about the length of circumference and area of circles at 80% or more.	Students can be able to solve problems about the length of circumference and area of circles at 70-79%	Students can be able to solve problems about the length of circumference and area of circles at 60-69%	Students can be able to solve problems about the length of circumference and area of circles less than 60%.

Chapter 9

Mathematics (M16101)

Content: 3 Dimensional geometric figure

Time: 13 hours

Strand 2: Measurement and Geometry

Standard M2.1: Understand measurement fundamentals; measure and estimate the size of objects, and apply such knowledge.

Standard M2.2 Understand and analyze geometric figures, their properties, relationships among figures, geometric theorems, and apply them

Grade level indicators

M2.1 Gr6/1 Shows how to find the answer to a problem about the volume of a three-dimensional geometric figure consisting of a rectangular prism

M2.2 Gr6/3 Describe the characteristics of different types of three-dimensional geometric shapes.

M2.2 Gr6/4 Identify three-dimensional geometric figures composed of nets and identify nets of three-dimensional geometric figures.

Learning Objective

Students will be taught to :

1. Know sphere, cylinder, cone, pyramid.
2. Net of cylinder, cone, prism, pyramid
3. The volume of a three-dimensional geometric figure composed of right-angled rectangles.
4. Solving problems on the volume of three-dimensional geometric shapes consisting of rectangular prisms

Content

- A prism is a three-dimensional solid geometric figure with two bases, which are equal polygons and lie in parallel planes. The sides are parallelograms. Types of prisms classified by the polygon that is the cross-section or base. The number of sides of a prism is equal to the number of sides of the polygon that is the cross-section or base. The total number of faces of a prism is equal to the number of cross-sections or bases plus the number of sides.
- A pyramid is a three-dimensional solid geometric shape with a polygonal base, a vertex that is not in the same plane as the base, and triangular sides. Types of pyramids classified by the base polygon, the number of sides of the pyramid is equal to the number of sides of the base polygon. The total number of faces of the pyramid is equal to the number of bases plus the number of sides.
- Solving problems about the volume or capacity of three-dimensional geometric shapes consisting of right rectangles, starting from understanding the problem, planning a solution, executing the plan, and checking.

Key competencies of learners

- Communication ability
- Ability to use life skills
- Ability to use technology

Desirable Characteristics:

- Disciplined
- Live simply
- Committed to work

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Characteristics and parts of three-dimensional geometric shapes	- Correctly describe the characteristics and parts of 3D geometric shapes.	- Review the types of 3D geometric shapes using models of 3D geometric shapes and give examples of things around you that have 3D geometric shapes.
2. Worksheet on Net of 3D geometric shapes	- Identify the net of three-dimensional geometric shapes and three-dimensional geometric shapes that are composed of nets correctly.	- Introduce the characteristics and total number of faces of each type of 3D geometric shape. - State the characteristics of each face of the model of each type of 3D geometric shape and draw illustrations to illustrate the explanation.
3. Worksheet on Volume and capacity of geometric shapes Three-dimensional	- Find the volume and capacity of three-dimensional geometric shapes consisting of right-angled rectangles correctly.	- Review the formulas for finding the volume and capacity of rectangular prisms. Then, together, tell how to find the volume of the given shapes, and draw a diagram to show Finding the volume and capacity.

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
		of three-dimensional geometric shapes.
4. Worksheet on Three-dimensional geometric problem solving	- Correctly solve problems on the volume or capacity of three-dimensional geometric shapes consisting of right-angled rectangles	- Together, tell what the question asks and what the question tells from the given situation to lead to planning and finding the answer to solve the problem of volume or capacity of three - dimensional geometric shapes consisting of right-angled rectangles.

Assessment Includes:

1. Knowledge: Students must score at least 60 percent up.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or above.
3. Desirable Characteristics: Assessment result must be at Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1.Tell characteristics and parts of three-dimensional geometric shapes	Students can be able to tell characteristics and parts of three-dimensional geometric shapes at 80% or more.	Students can be able to tell characteristics and parts of three-dimensional geometric shapes at at 70-79%	Students can be able to tell characteristics and parts of three-dimensional geometric shapes at at 60-69%	Students can be able to tell characteristics and parts of three-dimensional geometric shapes at less than 60%
2. Create Net of 3D geometric shapes	Students can be able to Create Net of 3D geometric	Students can be able to Create Net of 3D	Students can be able to Create Net of 3D geometric	Students can be able to Create Net of 3D geometric

Assessment Item	Assessment Criteria			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
	shapes at 80% or more.	geometric shapes 70-79%	shapes at 60-69%	shapes less than 60%.
3. Know the volume and capacity of geometric shapes Three-dimensional	Students can be able know the volume and capacity of geometric shapes Three-dimensional at 80% or more.	Students can be able know the volume and capacity of geometric shapes Three-dimensional at 70-79%	Students can be able know the volume and capacity of geometric shapes Three-dimensional at 60-69%	Students can be able know the volume and capacity of geometric shapes Three-dimensional less than 60%.
4. Solve Three-dimensional geometric problem solving	Students can be able to solve Three-dimensional geometric problem solving at 80% or more.	Students can be able to solve Three-dimensional geometric problem solving at 70-79%	Students can be able to solve Three-dimensional geometric problem solving at 60-69%	Students can be able to solve Three-dimensional geometric problem solving less than 60%.

Chapter 10

Mathematics (M16101)

Content: Presentation of information

Time: 10 hours

Strand 3: Statistics and Probability

Standard M3.1: Understand statistical processes and use statistical knowledge to solve problems.

Grade level indicators

M3.1 Gr6/1 Use the information from the pie chart to find the answer to the problem.

Learning Objective

Students will be taught to :

1. Read a circle Chart Net of cylinder, cone, prism, pyramid

Content

- A pie chart is a form of data presentation in which the area of a circle is divided into sections based on the amount of each piece of data. It is usually expressed as a percentage, or percent, with the sum of all the pieces of data being 100%.
- Solving problems with circle charts starts with understanding the problem, planning the solution, implementing the plan and checking it.

Key competencies of learners

- Communication ability
- Ability to use life skills
- Ability to use technology

Desirable Characteristics:

- Disciplined
- Live simply
- Committed to work

Workpiece and Task Responsibilities

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
1. Worksheet on Reading a Circle Chart	- Read circle charts correctly	- Consider reading a circle chart together. Explain the characteristics of a circle chart, which is a way to present data using circles.
2. Worksheet on Solving Pie Chart Problems	- Use the data from the pie chart to find the correct answer to the problem.	- Consider the given problem situation and then jointly state what the problem asks, what the problem says, and how to

Workpiece / Task Responsibility	Assessment Criteria / Indicators	Learning Activities
		find the answer from the given situation..

Assessment Includes:

1. Knowledge: Students must score at least 60 percent up.
2. Mathematical Skills and Processes: Assessment result must be at Level 2 or above.
3. Desirable Characteristics: Assessment result must be at Level 2 or above.

Assessment Criteria

Assessment Item	Assessment Criteria			
	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)
1. Reading a Circle Chart	Students can be able reading a Circle Chart at 80% or more.	Students can be able reading a Circle Chart at 70-79%	Students can be able reading a Circle Chart at 60-69%	Students can be able reading a Circle Chart at less than 60%
2. Solving Pie Chart Problems	Students can be able to solving Pie Chart Problems at 80% or more.	Students can be able to solving Pie Chart Problems 70- 79%	Students can be able to solving Pie Chart Problems at 60- 69%	Students can be able to solving Pie Chart Problems less than 60%.

Assessment and Evaluation of Learning Outcomes

Baansankamphaeng School has established criteria for assessing and evaluating students' learning outcomes in Mathematics, under the Mathematics subject group. The assessment covers three main aspects: knowledge, skills/processes, and desirable characteristics, in accordance with the Basic Education Core Curriculum B.E. 2551 (2008). The purposes of assessment and evaluation are to:

Promote student development

Determine academic achievement

The school has defined the following guidelines for assessment and evaluation:

1. Forms of Assessment and Evaluation

1.1 Pre-Assessment

Assessment of students' readiness and prior knowledge

Evaluation of students' understanding of topics prior to instruction

1.2 Formative Assessment (During Instruction)

Individual communication-based assessment

Performance-based assessment

Authentic assessment

Portfolio assessment

1.3 Summative Assessment (Post-Instruction)

End-of-lesson assessment

End-of-year assessment

Learning outcome evaluations are conducted based on learning indicators, with a ratio of coursework to final exam scores set at 70:30.

2. Methods of Assessment and Evaluation

To accurately reflect students' competencies and actual characteristics, a variety of methods and tools are used, including:

2.1 Testing

This method evaluates students' knowledge, thinking abilities, and progress in learning. Various test formats are used, such as multiple-choice, short-answer, essay, fill-in-the-blank, true/false, and matching.

2.2 Observation

Observation is used to assess students' behaviors, emotions, interactions, group work relationships, cooperation, planning, perseverance, problem-solving methods, working skills, and use of tools and equipment during learning and activities. Teachers may conduct observations at any time, either formally—with predetermined times and target individuals—or informally as general observations. Observation tools are developed by analyzing the components to be observed, setting criteria and indicators for observation, and using instruments such as checklists and rating scales.

2.3 Interviewing

Interviewing involves conversation and questioning to gather information that may not be clearly visible through students' behaviors in project work, group activities, or daily routines. Informants in the interview may include the student, peers, or even parents. Interviews can be conducted formally—with scheduled date, time, and specific topics—or informally through general, spontaneous conversation. Informal interviews can help build good rapport and often yield more accurate, realistic information. Teachers should prepare guiding questions in advance to ensure focused discussions.

2.4 Performance Assessment

Performance assessment involves evaluating students' actions and execution of tasks, such as the creation of projects or products, demonstrations, or displays of skills and abilities reflected in the students' work. Teachers must prepare assessment tools including assessment criteria, components, and instruments such as scoring rubrics, rating scales, and checklists.

2.5 Scoring Rubric

A scoring rubric is used to analyze the components and assessment criteria in order to describe the quality of student work or actions in levels—whether qualitative, quantitative, or skill-based. Rubrics serve as a guide for evaluation and provide important information to teachers, parents, and other stakeholders about what the student has learned, how well they perform, and the quality of their work. The assessment can be done as a holistic score or by evaluating individual components.

2.6 Portfolio Assessment

Portfolio assessment evaluates students' ability to produce work by integrating knowledge, experiences, efforts, feelings, and personal opinions. It involves the collection, selection, reflection, and evaluation of student work. This type of assessment reflects management skills, creativity, and evidence of students' learning achievements and potential within the subject area.

3. Assessment and Evaluation of Tasks / Student Work

Tools used include:

Observation forms	Interview forms / Questionnaires
Activity sheets	Worksheets / Tests

4. Instruments for Assessing Tasks / Student Work

Observation forms	Interview forms / Questionnaires
Activity sheets	Worksheets / Tests

5. Evaluators

Subject teachers	Students themselves
Peers	Parents

6. Assessment Criteria for the Mathematics Learning Area

Assessment results in the Mathematics Learning Area must combine scores from three aspects: knowledge, skills/processes, and desirable characteristics. The final achievement is classified into the following grade levels:

Level 4	= Score 80 – 100
Level 3.5	= Score 75 – 79
Level 3	= Score 70 – 74
Level 2.5	= Score 65 – 69
Level 2	= Score 60 – 64
Level 1.5	= Score 55 – 59
Level 1	= Score 50 – 54
Level 0	= Score 0 – 49

7. Pass Criteria for the Mathematics Learning Area

7.1 Students must attend at least 80% of the total instructional time.

7.2 Students must pass at least 65% of the learning indicators, with a minimum score of 50% for each indicator.

7.3 Students must receive a minimum achievement level of 1 or higher in the Mathematics Learning Area.

7.4 Students must achieve a pass level in the assessment of reading, analytical thinking, and writing within the Mathematics Learning Area.

7.5 Students must achieve a pass level in the assessment of desirable characteristics within the Mathematics Learning Area.

Glossary

Glossary

Probability distribution

A probability distribution describes a random variable by showing all possible values and the probabilities of each value occurring.

Approximation

An approximation is a value that is not exact but sufficiently accurate for practical use. For example, approximating 25.20 as 25, 178 as 180, or 18.45 as 20 to simplify calculations. The resulting value is called an approximated value.

Estimation

Estimation is the process of calculating an approximate result by first approximating each number involved in a problem and then performing the necessary operations. Rounding may or may not be used depending on the context or appropriateness of the situation.

Geometric transformation

Geometric transformation refers to changes in a figure's position or size. Transformations that preserve shape and size include translation, reflection, and rotation. Transformations that change the size while keeping a similar shape are called dilatations (enlargement or reduction).

Exploration, Investigation, and Conjecture of Geometric Properties

This process encourages learners to construct knowledge independently through geometry-based activities. Teachers should provide tasks where students apply their prior knowledge to explore, observe patterns, and make conjectures about geometric properties. Students should then verify the correctness of their conjectures, possibly through further study or comparison with known geometric theorems. Assessment can be based on students' participation in these activities.

Demonstrating Problem-Solving Methods

This involves expressing the ideas, methods, or steps used to solve a problem. It may include drawing diagrams, writing simple explanations, or providing detailed step-by-step solutions.

Solving Mixed Operations (Addition, Subtraction, Multiplication, Division)

This refers to solving problems involving more than one operation, such as:

$$(4 + 7) - 3 = \bullet$$

$$(18 \div 2) + 9 = \bullet$$

$$(4 \times 25) - (3 \times 20) = \bullet$$

The above are examples of problems with mixed operations. The term does not apply to single-operation problems.

$$(4 + 7) - 3 = \bullet$$

This is a two-step addition problem.

$$(4 \times 25) - (3 \times 20) = \bullet$$

This is a three-step multiplication problem.

Spatial Reasoning

Spatial reasoning refers to the use of knowledge and understanding of the properties of geometric shapes and the relationships between them to reason, explain phenomena, or solve geometric problems.

Data

Data refers to facts or accepted information about a particular topic, gathered through collection. It may consist of textual or numerical information.

Number Sense

Number sense is an intuitive understanding of numbers, including:

Understanding numbers as quantities (e.g., 5 pencils) and as ordinals (e.g., fifth place in a race).

Recognizing multiple relationships between numbers (e.g., 8 is one more than 7 but two less than 10).

Understanding the magnitude or value of a number compared to others (e.g., 8 is close to 4 but much less than 100).

Understanding the effects of operations on numbers (e.g., $65 + 42$ should be more than 100 because $60 + 40 = 100$).

Using prior experience to evaluate the reasonableness of a number (e.g., A report stating that a first-grade student is 250 cm tall is likely inaccurate).

Part-Whole Relationship

The part-whole relationship refers to representing a number as a combination of two or more parts whose sum equals the original number. For example, 8 can be written as:

2 and 6

3 and 5

0 and 8

1, 2, and 5

Number

"Number" is an undefined term (a primitive concept) used to represent quantities. There are many types of numbers, such as counting numbers, integers, fractions, and decimals.

Missing Number or Missing Shape

A missing number or shape is a value or figure that, when placed into the blank in a pattern, maintains the relationship or rule of the pattern.

Example:

3 5 7 9 11 ____ → The missing number is 13

→ The missing shape is the one that completes the visual pattern

Unknown Value (Variable)

An unknown value is a symbol used to represent a quantity that is not yet known in a symbolic statement. The unknown can appear in any part of the statement.

At the primary school level, the value of an unknown can often be found using the relationships of addition and subtraction or multiplication and division.

Examples:

$$\underline{\hspace{1cm}} + 333 = 999$$

$$18 \times n = 54$$

$$120 = A \div 9$$

$$789 - 156 = \bullet$$

Numeral

A numeral is a symbol used to represent a number.

Examples:

The number of mangosteens can be written in different numeral systems:

Thai numeral: ๗

Hindu-Arabic numeral: 7

Roman numeral: VII

All the numerals represent the same quantity, though the symbols are different.

One-Way Table

A one-way table is a table that categorizes data based on a single characteristic.

Example: Number of students by grade level at a school

Grade Level	Number of Students
Grade 1	65
Grade 2	70
Grade 3	69
Grade 4	62
Grade 5	72
Grade 6	60
Total	398

Problem Solving

Problem solving is a process that students should learn, practice, and develop into a skill in order to construct new knowledge. It enables students to think in diverse ways, apply and adapt different problem-solving methods appropriately, verify and reflect on their processes, and cultivate habits such as being proactive, persistent, and confident in dealing with problems both inside and outside the classroom.

Moreover, problem solving is a fundamental skill that students can apply in real-life situations. To effectively promote students' learning in problem solving, teachers should present stimulating and engaging mathematical situations or problems that encourage the application of mathematical knowledge, problem-solving steps and processes, and a variety of strategies.

Mathematical Communication and Representation

Communication is the exchange of ideas and the creation of understanding between individuals through various means such as listening, speaking, reading, writing, observing, and using gestures.

Mathematical communication involves not only regular communication channels but also the use of mathematical symbols, variables, tables, graphs, equations, inequalities, functions, or models to convey meaning.

Mathematical communication and representation are essential skills and processes that help students clearly and effectively express their understanding, mathematical ideas, and thought processes to others. Participation in discussions, writing to share knowledge and opinions, and exchanging experiences while being open to others' perspectives helps students learn mathematics more meaningfully, understand more deeply, and retain knowledge longer.

Connections in Mathematics

Making connections in mathematics is a process that requires critical thinking, analysis, and creativity. It involves relating mathematical knowledge, content, and principles in a logical way to skills and processes across mathematical topics and to real-world applications. This helps in solving problems and learning more complex or complete concepts.

Connecting mathematical knowledge allows for solving problems in multiple and more efficient ways, giving more meaning to students' mathematical learning.

Connecting mathematics with other disciplines involves relating mathematical knowledge, skills, and processes with content and concepts in other subjects such as science, astronomy, genetics, psychology, and economics. This makes learning mathematics more engaging, meaningful, and allows students to see the importance of mathematics in real life.

When students recognize these connections, they can see the relationships between mathematical content and between mathematics and other disciplines, leading to deeper understanding, better retention, and a clearer perception of mathematics as valuable, interesting, and useful in everyday life.

Reasoning

Reasoning is a mathematical thinking process that involves analysis and creativity in gathering facts, statements, concepts, and mathematical situations, then identifying patterns, relationships, or connections to develop new conclusions or understandings.

Reasoning

Pattern

A pattern is a relationship that shows common characteristics among a set of numbers, geometric figures, or other objects.

Examples:

- | | | | | | | |
|-----|-----------------|-----------------|-----------------|-----------------|-----------------|---------------|
| (1) | 1, | 3, | 5, | 7, | 9, | 11 |
| (2) | $\frac{1}{2}$, | $\frac{1}{4}$, | $\frac{1}{8}$, | $\frac{1}{2}$, | $\frac{1}{4}$, | $\frac{1}{8}$ |
| (3) | | | | | | |

Geometric Figure

A geometric figure is a shape consisting of points, straight lines, curves, planes, etc., at least one of these elements.

Examples of one-dimensional geometric figures include lines, line segments, and rays.

Examples of two-dimensional geometric figures include circles, triangles, and quadrilaterals.

Examples of three-dimensional geometric figures include spheres, cubes, prisms, and pyramids.

Digit

A digit is a basic symbol used to write numerals representing quantities. The most commonly used number system today is the decimal (base-10) system. To write any number in the decimal system, ten digits are used.

Digits used in Hindu-Arabic numerals are 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.

Digits used in Thai numerals are also 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.

Straightedge

A straightedge is a tool or device used to draw straight lines, such as line segments and rays. Normally, a straightedge does not have measurement markings. However, in teaching, a ruler may be used as a substitute for a straightedge, with the assumption that it has no measurement marks.

Single Unit and Compound Unit

Quantities obtained from measurement may use a single unit, such as “an orange weighs 12 kilograms,” or a compound unit, such as “a fish weighs 1 kilogram and 200 grams.”

Unit

A standard unit is a measurement unit generally accepted by everyone. For example, kilometer, meter, and centimeter are standard units for length measurement. Kilogram, gram, and milligram are standard units for weight measurement.

Ratio

A ratio is a relationship that compares two quantities, which may have the same or different units. The ratio of quantity a to quantity b is written as $a : b$.

Producers

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Ms. Pareena	Pongthammachat
Ms. Suchanan	Srijai
Ms. Kotchakorn	Chairawang
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