

Preface

The learning of Mathematics imparts many skills that contribute to the development of the human mind. It trains the learner to think methodically and rationally, analyse various types of situations, anticipate and plan, make decisions and solve problems. Mathematics also serves as a tool that facilitates the gaining of knowledge related to science and technology. Mathematical skills and knowledge are indeed essential to enhance our standard and quality of living in the modern area.

The Basic Education Core Curriculum aims to inculcate the following five key competencies among students:

1. Communication Skill
2. Thinking Skill
3. Problem – Solving Skill
4. Applying Life Skill
5. Technological Application Skill

The learning areas in the study of mathematics are designed to enable students to acquire mathematical skills and knowledge according to their utmost potential. The learning areas are as follows:

- **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

Strands and Learning Standards

Strand 1: Numbers and Operations

- Standard M1.1: Understanding diverse methods of presenting numbers and their application in real life
- Standard M1.2: Understanding results of operations of numbers, relationships of operations, and application of operations for problem-solving
- Standard M1.3: Use of estimation in calculation and problem-solving
- Standard M1.4: Understanding of numerical system and application of numerical properties

Strand 2: Measurement

- Standard M2.1: Understanding of the basics of measurement; ability to measure and estimate the size of objects to be measured
- Standard M2.2: Solving measurement problems

Strand 3: Geometry

- Standard M3.1: Ability to explain and analyse two-dimensional and three-dimensional geometric figures
- Standard M3.2: Ability for visualisation, spatial reasoning and application of geometric models for problem-solving

Strand 4: Algebra

- Standard M4.1: Understanding and ability to analyse pattern, relation and function
- Standard M4.2: Ability to apply algebraic expressions, equations, inequalities, graphs and other mathematical models to

represent various situations as well as interpretation and application for problem-solving

Strand 5: Data Analysis and Probability

Standard M5.1: Understanding and ability to apply statistical methodology for data analysis

Standard M5.2: Application of statistical methodology and knowledge of probability for valid estimation

Standard M5.3: Application of knowledge of statistics and probability for decision-making and problem-solving

Strand 6: Mathematical Skills and Processes

Standard M6.1: Capacity for problem-solving, reasoning; communication and presentation of mathematical concept; linking various bodies of mathematical knowledge and linking mathematics with other disciplines; and attaining ability for creative thinking

For common understanding and correct interpretation, the curriculum prescribes various codes for learning standards and indicators. One example is shown below:

M 1.1 Gr 8/2	
M	Subject area of Mathematics
1.1	First subject area, Standard 1
Gr8/2	Indicator 2 for Grade 8 (Mathayom 2)

Learners' Quality

- Understand concepts of numbers, ratio, proportion, percentage, real numbers expressed in exponential notation with integer indices, square root and cube root of real numbers; can carry out operations involving integral numbers, fractions, decimals, exponents, square roots and cube roots of real numbers; can apply numerical knowledge in real life.

- Have knowledge and understanding of surface areas of prisms and cylinders, and volume of prisms, cylinders, pyramids, cones and spheres; can appropriately choose units of the various systems of measuring length, area, and volume; and can apply knowledge of measurement in real life.

- Can construct and explain stages of constructing two-dimensional geometric figures with compass and straight edge; can explain characteristics and properties of three-dimensional geometric figures, i.e., prisms, pyramids, cylinders, cones and spheres.

- Understand properties of congruence and similarities of triangles, parallels, Pythagoras' theorems and converse; can apply these properties for reasoning and problem-solving; and understand geometric transformation through translation, reflection and rotation.

- Can visualise and explain characteristics of two-dimensional and three-dimensional geometric figures.

- Can analyse and explain relationships of patterns, situations or problems; and can use single-variable linear equations, two-variable linear equation systems, single-variable linear inequality, and graphs in problem-solving.

- Can determine an issue, write questions about a problem or a situation, determine methods of study and collect and present data by utilizing pie charts or any other forms of presentation.

- Understand concepts of the measures of central tendency, arithmetic mean, median, and mode of non-frequency distribution data that can be chosen appropriately for application, as well as apply knowledge in considering statistical data and information.

- Understand the concepts of random sampling and probability; can apply knowledge of probability for projecting and for decision-making in various situations.

- Can apply diverse methods for problem-solving; avail 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 conclusion reached; can use mathematical language and symbols for communication; can communicate and present mathematical concepts accurately and clearly; can link various bodies of mathematical knowledge; can link mathematical knowledge, principles and processes with other disciplines; and have attained ability for creative thinking.

Yearly Teaching Plan

Mathematics

Grade 8 (Mathayom 2)

9 chapters

120 hours

Learning area	Duration (hours)
1. Rational and Irrational Numbers <ul style="list-style-type: none">• Rational numbers• Real numbers• Operations involving surds	10
2. Squares, Square Roots, Cubes and Cube Roots <ul style="list-style-type: none">• Squares• Square roots• Cubes• Cubes roots	13
3. Length and Area <ul style="list-style-type: none">• Length• Area of rectangles• Areas of triangles, parallelograms and trapeziums• Estimations of measurements	13
4. Ratio, Proportion and Percentages <ul style="list-style-type: none">• Ratio of two quantities• Proportion• Ration of three quantities• Relationship between percentages, fractions and decimals• Computations and problems involving percentages	21
5. Congruent Triangles <ul style="list-style-type: none">• Congruent triangles	7
6. Pythagoras' Theorem <ul style="list-style-type: none">• Relationship between the sides of a right-angled triangle• Converse of Pythagoras' Theorem	9

7. Transformations <ul style="list-style-type: none"> • Transformation • Translation • Reflection • Rotation • Isometry • Enlargement 	32
8. Statistics <ul style="list-style-type: none"> • Pie charts • Obtaining information from pie charts • Solving problems involving pie charts 	8
9. Probability <ul style="list-style-type: none"> • Probability scales • Probability 	7

Note: The hours needed for each subtopic can be changed when necessary.

The above allocated hours are just a suggestion. Total hours for this subject is as prescribed in the basic learning time structure, while the learners must attain the standard as prescribed in the learning standards and indicators.

Chapter 1 Rational and Irrational Numbers

Indicators and learning areas (10 hours)

Indicator	Learning Area
M1.1 Gr8/1 Write fractions in the form of decimals and write circulating decimals in form of fractions.	<ul style="list-style-type: none">• Rational numbers
M1.1 Gr8/2 Distribute prescribed real numbers and give examples of rational and irrational numbers.	<ul style="list-style-type: none">• Rational numbers• Real numbers
M1.4 Gr8/1 Explain relationships between real numbers, rational numbers, and irrational numbers.	<ul style="list-style-type: none">• Rational numbers• Real Numbers• Operations involving surds

Learning Objectives

Students will be taught to:

1. Understand what rational numbers are.
2. Convert recurring decimals into fractions and vice versa.
3. Understand what real numbers and irrational numbers are.
4. Understand what surds are and surds as irrational numbers.
5. Perform operations involving surds.

Learning Outcomes

Students will be able to:

1. Write fractions in decimal form and vice versa.
2. Understand what rational numbers are.
3. Understand what recurring decimals are.
4. Write fractions in recurring decimal form and vice versa.
5. Understand what real numbers, irrational numbers and surds are.
6. Simplify surds and rationalise the denominators of surds.
7. Perform operations involving surds.

Learning Areas

- Rational numbers
- Real numbers
- Operations involving surds

Teaching and Learning Activities

1st – 3rd hours (Rational numbers)

1. Guide the students to understand what rational numbers are.
2. Using Examples 1 and 2, guide them how to write numbers in the form of m/n .
3. Have a few volunteers do Questions 1 and 2 in Test Yourself 1.1.
4. Explain to students what recurring decimals are and the way to write them by using Example 3.
5. Using Example 4, guide students to convert recurring numbers into fractions.
6. Have a few students try out some questions in Questions 3 to 5 in the class. Discuss the answers with them.
7. Ask students to work on the exercises in this subtopic on pages 2 to 3 of the Workbook as their homework.

4th – 6th hours (Real numbers)

1. Explain to students what real numbers are.
2. Use Example 5 for further explanation.
3. Explain to students what irrational numbers are by using Example 6.
4. Ask students to work on Question 2 to test their understanding.
5. Guide students to understand what surds are.
6. Using Example 7, guide students to determine surds.
7. Have students work on Question 3 in Test Yourself 1.2.
8. Ask students to work on the exercises in this subtopic on pages 3 to 4 of the Workbook as their homework.

7th – 9th hours (Operations involving surds)

1. Explain to students the properties of surds by using Examples 8 to 11.
2. Have students work Questions 1 and 2 in Test Yourself 1.3. Discuss the answers with them.
3. Explain to students on how to rationalise the denominators by using Examples 12 and 13.
4. Have volunteers to work on Questions 3 and 4 in Test Yourself 1.3. Discuss the answers with them.
5. Ask students to work on the exercises in this subtopic on pages 4 to 7 of the Workbook as their homework.

10th hour (Conclusion)

1. Explain the mistakes shown in the Common Mistake column on page 11.
2. Ensure students understand the terms used in this chapter by referring to the Mathematical Terms column.
3. Revise the lesson using the Quick Revision column on page 12.

4. Randomly select 5 objective questions and 5 subjective questions from the Mastery Practice in the Textbook and have students solve them in the class. Have students work on the rest of the questions at home.
5. Ask students to do the Enrichment Exercises in the Workbook to test their understanding of this chapter as their homework.

Emphasized Characteristics:

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

Learning Materials:

- Focus Smart Textbook Mathematics M2
- Focus Smart Workbook Mathematics M2



Learning Outcome Form

Name-Surname:

No.

Mathayom:

Date:

Chapter 1 Rational and Irrational Numbers

Explanation: Summary of learning outcomes

Contents that you need for teacher to explain further:
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Feeling after learning this chapter:
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Knowledge gained from this chapter:
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Chapter 1
Rational and
Irrational Numbers

Contents that you like the most in this chapter (give your reason):
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Exercises that you like and want to be selected as the outstanding work:
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Application of knowledge from this chapter on your daily life:
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Chapter 2 Squares, Square Roots, Cubes and Cube Roots

Indicators and learning areas (13 hours)

Indicator	Learning Area
M1.1 Gr8/3 Explain and specify square roots and cube roots of real numbers.	<ul style="list-style-type: none">• Squares
M1.2 Gr8/1 Find square root and cube root of integral numbers by separating factors for the purpose of problem-solving as well as be aware of validity of the answers.	<ul style="list-style-type: none">• Square roots• Cubes• Cube roots
M1.2 Gr8/2 Explain results of finding square root and cube root of integral numbers, fractions and decimals, and express the relationship between exponents and roots of real numbers	
M1.3 Gr8/1 Find estimates of square root and cube root of real numbers, which can be applied for problem-solving, as well as be aware of validity of the answers.	

Learning Objectives

Students will be taught to:

1. Understand what squares and square roots are.
2. Estimating square roots of positive numbers.
3. Solving problems involving squares and square roots.
4. Understand what cubes and cube roots are.
5. Estimating cube roots of numbers.
6. Solving problems involving cubes and cube roots.

Learning Outcomes

Students will be able to:

1. Understand what squares and square roots are.
2. Determine the squares of numbers.
3. Determine the square roots of perfect squares, fractions and decimals.
4. Estimate squares and square roots of numbers
5. Solve problems involving squares and square roots.
6. Understand what cubes and cube roots are.
7. Determine cubes and cube roots of integers.
8. Estimate cubes and cube roots of numbers.
9. Solve problems involving cubes and cube roots.

Learning Areas

1. Squares
2. Square roots
3. Cubes
4. Cube roots

Teaching and Learning Activities

1st – 3rd hours (Squares)

1. Revise the meaning of squares by asking them to work out Questions 1 and 2 in Test Yourself 2.1.
2. Guide students to determine the squares of numbers and mixed numbers by using Examples 3 and 4.
3. Ask students to work out Questions 3 and 4 in Test Yourself 2.1.
4. Guide students to estimate the squares of numbers by using
 - Approximation
 - Determining the range
5. Use Examples 5 and 6 as samples.

6. Ask students to try Questions 5 and 6 in Test Yourself 2.1. Discuss the answers with them.
7. Explain to students what perfect squares are by using Examples 7 and 8.
8. Ask them to try Questions 7 and 8 in Test Yourself 2.1.
9. Using Example 9, guide students to solve problems involving squares of numbers.
10. Ask them to try Questions 9 to 11 in Test Yourself 2.1.
11. Have students work on the exercises in this subtopic on pages 10 to 14 of the Workbook as their homework.

4th – 6th hours (Square roots)

1. Refresh students' memory of what square roots are by asking them to do Question 1 in Test Yourself 2.2.
2. Guide them to determine the square roots of perfect squares, fractions and decimals.
3. Ask them to try Questions 2 to 4 in Test Yourself 2.2. Discuss the answers with them.
4. Test students' understanding of the relationship between squares and square roots by asking them to try Questions 5 to 7 in Test Yourself 2.2.
5. Guide students to estimate square roots of positive numbers by
 - Approximation
 - Determining the range
6. Use Example 11 and 12 as samples.
7. Have volunteers try Questions 8 and 9 in Test Yourself 2.2. Discuss answers with them.
8. Guide them to solve problems involving squares and square roots by using Examples 13 and 14.
9. Have students work on Questions 10 to 12 in Test Yourself 2.2.
10. Ask students to work on the exercises in this subtopic on pages 14 to 17 of the Workbook as their homework.

7th – 9th hours (Cubes)

1. Refresh students' memory of what cubes are by asking them to do Questions 1 to 3 in Test Yourself 2.3. Discuss the answers with them.
2. Guide students on how to estimate cubes by using Example 16 and 17.
3. Have volunteers try Questions 4 and 5 in Test Yourself 2.3.
4. Using Example 18, help students to solve problems involving cubes.
5. Test their understanding by asking them to work on Questions 4 and 5 in Test Yourself 2.3.
6. Ask students to work on the exercises in this subtopic on pages 18 to 20 of the Workbook as their homework.

10th – 12th hours (Cube roots)

1. Refresh students' memory of what cube roots are by asking them to do Question 1 in Test Yourself 2.4.
2. Guide students to determine the cube roots of integers, fractions and decimals by using Examples 19 to 21.
3. Have a few students work on Questions 2 to 4 in Test Yourself 2.4. Discuss the answers with them.
4. Show students how to estimate cube roots of numbers by using Examples 22 and 23.
5. Ask them to work on Questions 5 and 6 in Test Yourself 2.4.
6. Guide students to solve problems involving cubes and cube roots by using Example 24.
7. Have two students try Questions 7 and 8 in Test Yourself 2.4. Discuss the answers with them.
8. Guide students to compute operations involving squares, square roots, cubes and cube roots by using Example 25.
9. Have a few volunteers work on Question 9 in Test Yourself 2.4.
10. Ask students to work on the exercises in this subtopic on pages 20 to 24 of the Workbook as their homework.

13th hour (Conclusion)

1. Explain the mistakes shown in the Common Mistake column on page 34.
2. Ensure students understand the terms used in this chapter by referring to the Mathematical Terms column.
3. Revise the lesson using the Quick Revision column on page 35.
4. Randomly select 5 objective questions and 5 subjective questions from the Mastery Practice in the Textbook and have students solve them in the class. Have students work on the rest of the questions at home.
5. Ask students to do the Enrichment Exercises in the Workbook to test their understanding of this chapter as their homework.

Emphasized Characteristics

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

Learning Materials

- Focus Smart Textbook Mathematics M2
- Focus Smart Workbook Mathematics M2



Learning Outcome Form

Name-Surname:

No.

Mathayom:

Date:

Chapter 2 Squares, Square Roots, Cubes and Cube Roots

Explanation: Summary of learning outcomes

Contents that you need for teacher to explain further:
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Feeling after learning this chapter:
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Knowledge gained from this chapter:
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Chapter 2
Squares, Square
Roots, Cubes and
Cubes Roots

Contents that you like the most in this chapter (give your reason):
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Application of knowledge from this chapter on your daily life:
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Exercises that you like and want to be selected as the outstanding work:
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Chapter 3 Length and Area

Indicators and learning areas (13 hours)

Indicators	Learning Areas
M2.1 Gr8/1 Compare measuring units for length and area of the same and different systems and choose appropriate measuring units.	<ul style="list-style-type: none">• Length• Area of rectangles
M2.1 Gr8/2. Appropriately estimate time, distance, area, volume and weight, and explain the method used for estimation. M2.1 Gr 8/3 Appropriately choose estimation for measurement in various situations.	<ul style="list-style-type: none">• Estimations of measurements
M2.2 Gr8/1 Apply knowledge of length and area for problem-solving in various situations.	<ul style="list-style-type: none">• Length• Area of rectangles• Area of triangles parallelograms and trapeziums

Learning Objectives

Students will be taught to:

1. Understand units of length.
2. Solve problems involving lengths.
3. Understand units of area.
4. Find and solve problems involving areas of rectangles, triangles, parallelograms and trapeziums.
5. Estimate measurements.

Learning Outcomes

Students will be able to:

1. Use appropriate units for lengths.
2. Convert units of lengths.
3. Calculate and solve problems involving lengths.
4. Understand and use appropriate units for areas.
5. Estimate areas using grid paper.
6. Find area of a rectangle.
7. Solve problems involving areas of rectangles.
8. Identify the heights and bases of triangles, parallelograms and trapeziums.
9. Find areas of triangles, parallelograms and trapeziums.
10. Solve problems involving areas of triangles, parallelograms and trapeziums.
11. Estimate measurements.

Learning Areas

1. Length
2. Area of rectangles
3. Areas of triangles, parallelograms and trapeziums
4. Estimations of measurement

Teaching and Learning Activities

1st – 3rd hours (Length)

1. Refresh students' memory of what length and units of lengths are.
2. Briefly explain the units of length used in the British system and the modern metric system too.

3. Explain that we need to use appropriate units when measuring different lengths such as the length between two cities, the length of a table and the length of an eraser.
4. Guide students to measure lines in Examples 1 and 2.
5. Have two students work on Question 1 in Test Yourself 3.1.
6. Refresh students' memory on the relationship between the units of measurements of length.
7. Use Examples 2 and 3 for further explanation.
8. Test students' understanding of conversion of length units by asking them to do Questions 2 to 4 in Test Yourself 3.1.
9. Guide students on how to perform calculations involving length by using Examples 4 and 5.
10. Have a few students work on Questions 5 and 6 in Test Yourself 3.1. Discuss the answers with them.
11. Using Examples 6 and 7, guide students to solve problems involving length.
12. Have three volunteers try Questions 7 to 9 in Test Yourself 3.1. Discuss the answers with them.
13. Ask students to work on the exercises in this subtopic on pages 27 to 31 of the Workbook as their homework .

4th – 6th hours (Area of rectangle)

1. Refresh students' memory what area is.
2. Briefly explain the units of area used in the British system and the modern metric system too.
3. Explain that we need to use appropriate units when measuring different areas such as the area of a shopping centre, the area of a table and the area of an eraser.
4. Use Example 8 to explain to students how to find areas of shapes drawn on grid.

5. Test students' understanding by asking them to do Question 1 in Test Yourself 3.2.
6. Guide students on how to find area of rectangles by using Example 9.
7. Have a few students work on Questions 2 and 3 in Test Yourself 3.2.
8. Using Example 10, solve the problem with students.
9. Get students to solve problems related to areas of rectangles in Questions 4 and 5 in Test Yourself 3.2.
10. Ask students to work on the exercises in this subtopic on pages 32 to 34 of the Workbook as their homework.

7th – 10th hours (Areas of triangles, parallelograms and trapeziums)

1. Guide students to identify the heights and bases of triangles, parallelograms and trapeziums by using the diagrams in page 48 in the Textbook.
2. Use Example 1 and Question 1 in Test Yourself 3.3 to test students' understanding.
3. Guide students to find areas of right-angled triangles, triangles, parallelograms, trapeziums and figures made up of triangles, parallelograms or trapeziums by using Examples 12 to 14.
4. Test their understanding by asking them to do Questions 2 to 4 in Test Yourself 3.3
5. Ask students to work on the exercises in this subtopic on pages 35 to 39 of the Workbook as their homework.

11th – 12th hours (Estimation of measurements)

1. Explain the meaning of estimation in measuring objects.
2. Explain and show the body parts that we can use to measure the lengths and volume of objects such as our height, hand span, our foot and the length of our arm out-stretched.
3. Ask students to use their body parts to measure the length and volume of some objects in the classroom.

4. Explain and show how we can estimate weight of objects by comparing them with an object that its weight is known.
5. Explain and show how to measure time using a multi-ball pendulum and dripping of water.
6. Test students' understanding by asking them to carry out the task in Questions 1 and 2 in Test Yourself 3.4.
7. Ask students to work on the exercises in this subtopic on pages 39 to 40 of the Workbook as their homework.

13th hour (Conclusion)

1. Explain the mistakes shown in the Common Mistake column on page 57.
2. Ensure students understand the terms used in this chapter by referring to the Mathematical Terms column.
3. Revise the lesson using the Quick Revision column on page 58.
4. Randomly select 5 objective questions and 5 subjective questions from the Mastery Practice in the Textbook and have students solve them in the class. Have students work on the rest of the questions at home.
5. Ask students to do the Enrichment Exercises in the Workbook to test their understanding of this chapter as their homework.

Emphasized Characteristics

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

Learning Materials

- Focus Smart Textbook Mathematics M2
- Focus Smart Workbook Mathematics M2
- Multi-ball pendulum



Learning Outcome Form

Name-Surname:

No.....

Mathayom:

Date:

Chapter 3 Length and Area

Explanation: Summary of learning outcomes

Contents that you need for teacher to explain further:

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Feeling after learning this chapter:

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Knowledge gained from this chapter:

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**Chapter 3
Length and Area**

Application of knowledge from this chapter on your daily life:

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Exercises that you like and want to be selected as the outstanding work:

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Contents that you like the most in this chapter (give your reason):

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Chapter 4 Ratio, Proportion and Percentage

Indicators and learning areas (21 hours)

Indicators	Learning Areas
M1.1 Gr8/4 Apply knowledge of ratio, fraction and percentage to solve problems	<ul style="list-style-type: none">• Ratio of two quantities• Proportion• Ratio of three quantities• Relationship between percentages, fractions and decimals• Computation and problems involving percentages

Learning objectives

Students will be taught to:

1. Understand the meaning of ratios and proportion.
2. Perform simple calculations and solve problems involving ratios and proportions.
3. Understand the relationship between percentages, fractions and decimals.
4. Convert fractions and decimals into percentage and vice versa.
5. Perform simple calculation and solve problems involving percentages.

Learning Outcomes

Students will be able to:

1. Compare two quantities.
2. Determine whether given ratios are equivalent.
3. Simplify ratios to the lowest terms.
4. State ratios related to a given ratio.
5. State whether two pairs of quantities are a proportion.
6. Determine if two quantities are proportional, given their values.
7. Find the value of a quantity, given the ratio of the two quantities and the value of another quantity.
8. Find the value of a quantity, given the ratio and the sum of the two quantities.
9. Find the sum of two quantities, given their ratio and the difference between the quantities.
10. Solve problems involving ratios and proportions.
11. Compare three quantities.
12. Determine whether given ratios are equivalent.
13. Simplify a ratio of three quantities to the lowest term.
14. State the ratio of any two quantities, given the ratio of three quantities.
15. Find the ratio of $a:b:c$, given the ratio of $a:b$ and $b:c$.
16. Find the values of the other two quantities, given the ratio of three quantities and the value of one of the quantities.
17. Find the value of each quantity in a ratio.
18. Find the sum of three quantities, given the ratio and the difference between two of the three quantities.
19. Solve problems involving ratio of the quantities.
20. Express percentages as the numbers of parts in every 100.
21. Change fractions and decimals into percentages and vice versa.
22. Find the percentage of a quantity.

23. Find the percentage of a number out of the other.

24. Find the number represented by a percentage.

25. Find the percentage increase or decrease.

26. Solving problems involving percentages.

Learning Areas

- Ratio of two quantities
- Proportion
- Ratio of three quantities
- Relationship between percentages, fractions and decimals
- Computations and problems involving percentages

Teaching and Learning Activities

1st – 3rd (Ratio of two quantities)

1. Guide students on how to compare two quantities using Example 1.
2. Test students' understanding by asking them to do Question 1 in Test Yourself 4.1.
3. Using Example 2, show students how to determine if the given ratios are equivalent or having the same value.
4. Have four students work on Question 2 in test Yourself 4.1. Discuss the answers with them.
5. Guide students on how to simplify ratios to the lowest terms by using Example 3.
6. Ask six students to try Question 3 in Test Yourself 4.1.
7. Using Example 4, guide students to state related ratios from given ratios.
8. Test their understanding by asking them to work on Question 4 in test Yourself 4.1.
9. Ask students to work on the exercises in this subtopic on pages 43 and 44 of the Workbook as their homework.

4th – 7th hours (Proportion)

1. Explain how to determine if two pairs of ratios are a proportion by using Example 5.
2. Test students' understanding by asking them to do Question 1 in Test Yourself 4.2.
3. Using Example 6, guide students on how to determine if a given quantity is proportional to another quantity.
4. Have four volunteers to do Question 2 in Test Yourself 4.2. Discuss the answers with them.
5. Using Examples 7 to 13, guide students on how to find values of a quantity when given certain information and to solve problems involving ratios and proportions.
6. Spend time with students to solve Questions 3 to 10 in Test Yourself 4.2.
7. Ask students to work on the exercises in this subtopic on pages 45 to 47 of the Workbook as their homework.

8th – 12th hours (Ratio of three quantities)

1. Using Example 14, guide students on how to compare three quantities in the same unit.
2. Test students' understanding by asking them to do Question 1 in Test Yourself 4.3. Discuss the answers with them.
3. Guide students to determine if the given ratios are equivalent by using Example 15.
4. Have four students work on Question 2 in Test Yourself 4.3. Discuss the answers with them.
5. Using Example 16, show students how to simplify a ratio of three quantities to the lowest term
6. Have four students work on Question 3 in Test Yourself 4.3.

7. Guide students to state the ratio of any two quantities when the ratio of three quantities is given by using Example 17.
8. Have students work on Question 4 in Test Yourself 4.3.
9. Show students how to find the ratio of $a:b:c$ when the ratio of $a:b$ and $b:c$ are given. Use Example 18. Remind them of LCM.
10. Get two students to work on Question 5 in Test Yourself 4.3. Discuss the answers with them.
11. Guide students to find values of the other two quantities when the ratio of three quantities and the value of one quantity are given, by using Example 19.
12. Test students' understanding by asking them to try Questions 6 and 7 in Test Yourself 4.3. Discuss the answers with them.
13. Using Examples 20 and 21, teach students to find the value of each quantity in a ratio.
14. Ask students to do Questions 8 and 9 in Test Yourself 4.3. Discuss the answers with them.
15. Show students on how to find the three quantities when the ratio and the difference between two of the three quantities are given, by using Example 22.
16. Test students' understanding by asking them to do Question 10 and 11 in Test Yourself 4.3.
17. Using Examples 23 and 24, guide students to solve problems involving ratio of three quantities.
18. Have three students work on Questions 12 to 14 in Test Yourself 4.3. Discuss the answers with them.
19. Ask students to work on the exercises in this subtopic on pages 47 to 52 of the Workbook as their homework.

13th – 15th hours (Relationship between percentages, fractions and decimals)

1. Using Examples 25 to 29, guide students on how to convert fractions and decimals into percentages and vice versa.
2. Have students work on Questions 1 to 6 in Test Yourself 4.4. Discuss the answers with students.
3. Ask students to work on the exercises in this subtopic on pages 53 to 54 of the Workbook as their homework.

16th – 20th hours (Computation and problems involving percentages)

1. Guide students to find percentage of a quantity by using Examples 30 and 31.
2. Have students work on Questions 1 to 3 in Test Yourself 4.5. Discuss answers with them.
3. Using Examples 32 and 33, guide students to find percentage of a number out of another.
4. Ask students to work on Questions 4 and 5 in Test Yourself 4.5. Discuss the answers with them.
5. Show students how to find numbers presented by a percentage by using Examples 34 and 35.
6. Have three volunteers try Questions 6 to 8 in Test Yourself 4.5. Discuss answers with them.
7. Using Examples 36 and 37, guide students to find the percentage of increase and decrease.
8. Have two students answer Questions 9 and 10 in Test Yourself 4.5. Discuss answers with them.
9. Solve the problems in Examples 38 to 43 together with students.
10. Test their understanding by asking them to do Questions 11 to 13 Test Yourself 4.5. Discuss the answers with them.

11. Ask students to work on the exercises in this subtopic on pages 54 to 56 of the Workbook as their homework.

21st hour (Conclusion)

1. Explain the mistakes shown in the Common Mistake column on page 92.
2. Ensure students understand the terms used in this chapter by referring to the Mathematical Terms column.
3. Revise the lesson using the Quick Revision column on page 93.
4. Randomly select 5 objective questions and 5 subjective questions from the Mastery Practice in the Textbook and have students solve them in the class. Have students work on the rest of the questions at home.
5. Ask students to do the Enrichment Exercises in the Workbook to test their understanding of this chapter as their homework.

Emphasized Characteristics

1. Thinking skill
2. Problem-solving skill

Learning Materials

- Focus Smart Textbook Mathematics M2
- Focus Smart Workbook Mathematics M2



Learning Outcome Form

Name-Surname:

No.

Mathayom:

Date:

Chapter 4 Ratio, Proportion and Percentage

Explanation: Summary of learning outcomes

Contents that you need for teacher to explain further:
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Feeling after learning this chapter:
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Knowledge gained from this chapter:
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Chapter 4
Ratio, Proportion
and Percentage

Contents that you like the most in this chapter (give your reason):
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Application of knowledge from this chapter on your daily life:
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Exercises that you like and want to be selected as the outstanding work:
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Chapter 5 Congruent Triangles

Indicators and learning areas (7 hours)

Indicators	Learning Areas
M3.2 Gr8/1 Use properties of congruence of triangles and those of parallels for reasoning and problem-solving.	<ul style="list-style-type: none">Congruent triangles

Learning Objectives

Students will be taught to:

1. Understand what congruent triangles.
2. Test for congruent triangles.

Learning Outcomes

Students will be able to:

1. Understand what congruent triangles means.
2. Identify congruent triangles by applying
 - (a) 'Side-Side-Side' test
 - (b) 'Side-angle-Side' test
 - (c) 'Angle-Side-Angle' test

Learning Areas

- Congruent triangles

Teaching and Learning Activities

1st – 6th hours (Congruent triangles)

1. Explain to students the meaning of congruence and its symbol.
2. Explain how we denote a pair of congruent triangles. Emphasize the order of the corresponding sides or angles.

3. Using Example 1, show students how to find values of a pair of congruent triangles.
4. Test students' understanding by asking them to answer Question 1 in Test Yourself 5.1.
5. Guide students on how to test and confirm if a pair of triangles is congruent by using 'side-side-side' test, 'side-angle-side' test and 'angle-side-angle' test. Using Example 2 to 4.
6. Have six students determine if the triangles in Questions 2 to 4 are congruent. Discuss the answers with them.
7. Ask students to work on the exercises in this subtopic on pages 60 to 63 of the Workbook as their homework.

7th hour (Conclusion)

1. Explain the mistakes shown in the Common Mistake column on page 105.
2. Ensure students understand the terms used in this chapter by referring to the Mathematical Terms column.
3. Revise the lesson using the Quick Revision column on page 105.
4. Randomly select 5 objective questions and 5 subjective questions from the Mastery Practice in the Textbook and have students solve them in the class. Have students work on the rest of the questions at home.
5. Ask students to do the Enrichment Exercises in the Workbook to test their understanding of this chapter as their homework.

Emphasized Characteristics

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

Learning Materials

- Focus Smart Textbook Mathematics M2
- Focus Smart Workbook Mathematics M2



Learning Outcome Form

Name-Surname:

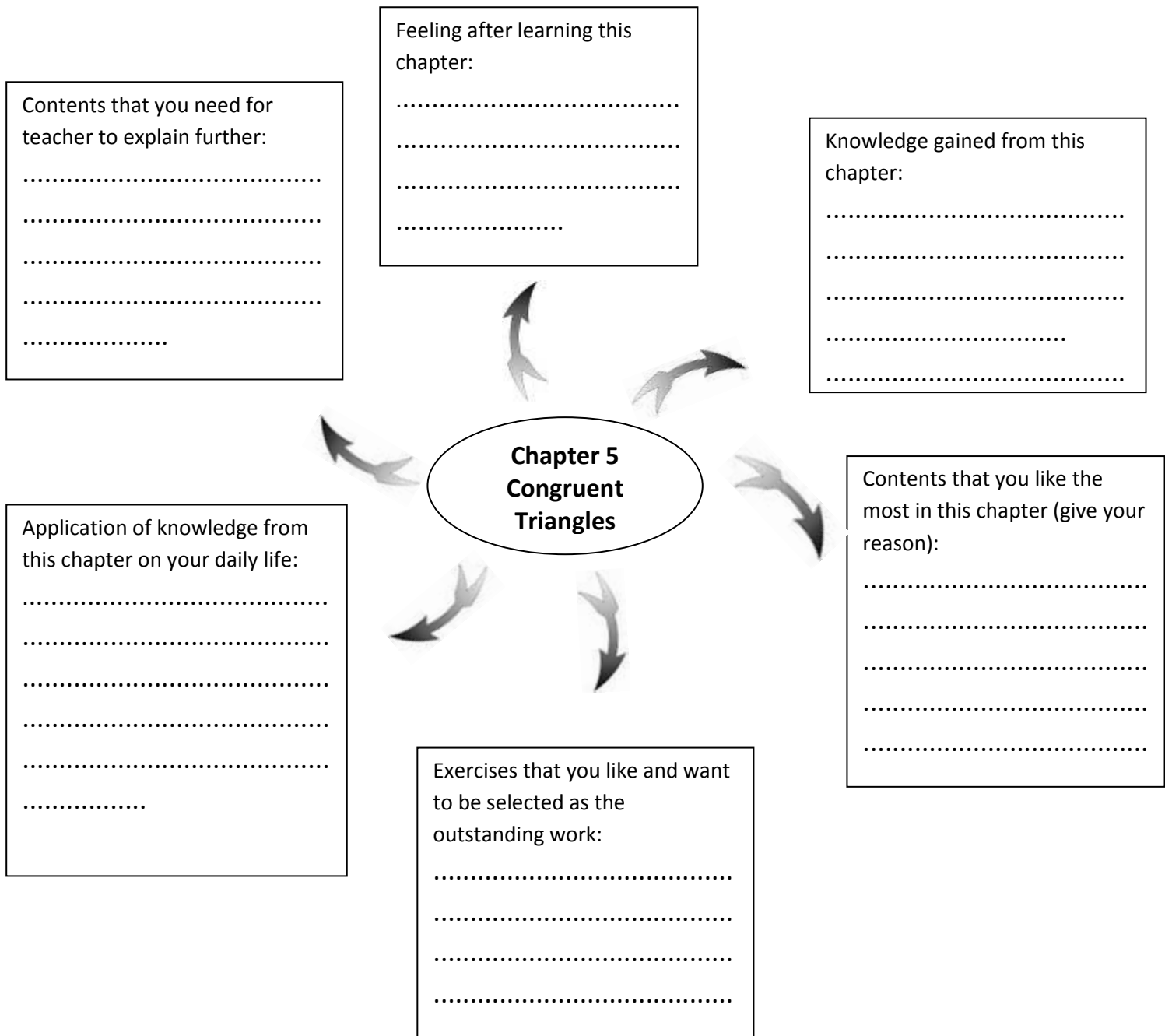
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Date:

Chapter 5 Congruent Triangles

Explanation: Summary of learning outcomes



Chapter 6 Pythagoras' Theorem

Indicators and learning areas (9 hours)

Indicators	Learning Areas
M3.2 Gr8/2 Use Pythagoras' Theorem and converse for reasoning and problem-solving.	<ul style="list-style-type: none">• Relationship between the sides of a right-angled triangle• Converse of Pythagoras' Theorem

Learning Objectives

Students will be taught to:

1. Understand the relationship between the sides of a right-angled triangle.
2. Understand Pythagoras' Theorem.
3. Solve problems involving converse of Pythagoras' Theorem.

Learning Outcomes

Students will be able to:

1. Identify the hypotenuse of a right-angled triangle.
2. Understand the relationship between the lengths of the sides of a right-angled triangle.
3. Find the length of the unknown side of a right-angled triangle.
4. Find the lengths of sides in geometric shapes.
5. Solve problems involving Pythagoras' Theorem.
6. Determine whether a triangle is a right-angled triangle.
7. Solve problems involving converse of Pythagoras' Theorem.

Learning Areas

- Relationship between the sides of a right-angled triangle.
- Converse of Pythagoras' Theorem.

Teaching and Learning Activities

1st – 4th hours (Relationship between the sides of a right-angled triangle)

1. Explain to students which side of a right-angled triangle is the hypotenuse.
2. Using Example 1 and Question 1 in Test Yourself 6.1, test students' understanding of hypotenuse.
3. Explain the Pythagoras' theorem to students by using Example 2.
4. Have four students try Questions 2 in Test Yourself 6.1. Discuss answers with them.
5. Guide students to find the length of unknown side of right-angled triangles and the lengths of sides of geometric shapes by using Examples 3 and 4.
6. Have eight volunteers work on Questions 3 to 5 in Test Yourself 6.1.
7. Using Examples 5 and 6, show students how to solve problems involving Pythagoras' theorem.
8. Have two students solve Questions 6 and 7 in test Yourself 6.1. Discuss the answers with them.
9. Ask students to work on the exercises in this subtopic on pages 66 to 69 of the Workbook as their homework.

5th – 8th hours (Converse of Pythagoras' theorem)

1. Explain what converse of Pythagoras' theorem means.
2. Using Examples 7 and 8, guide students on how to determine types of triangles with given lengths of the sides.
3. Test students' understanding by asking them to work on Questions 1 to 4 in Test Yourself 6.2. Discuss the answers with them.

4. Show students how to solve problem using Example 9.
5. Get a volunteer to solve the problem in Question 5 in Test Yourself 6.2.
6. Ask students to work on the exercises in this subtopic on pages 69 to 71 of the Workbook as their homework.

9th hour (Conclusion)

1. Explain the mistakes shown in the Common Mistake column on page 116.
2. Ensure students understand the terms used in this chapter by referring to the Mathematical Terms column.
3. Revise the lesson using the Quick Revision column on page 116.
4. Randomly select 5 objective questions and 5 subjective questions from the Mastery Practice in the Textbook and have students solve them in the class. Have students work on the rest of the questions at home.
5. Ask students to do the Enrichment Exercises in the Workbook to test their understanding of this chapter as their homework.

Emphasized Characteristics

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

Learning Materials

- Focus Smart Textbook Mathematics M2
- Focus Smart Workbook Mathematics M2



Learning Outcome Form

Name-Surname:

No.

Mathayom:

Date:

Chapter 6 Pythagoras' Theorem

Explanation: Summary of learning outcomes

**Chapter 6
Pythagoras'
Theorem**

Contents that you need for teacher to explain further:
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Feeling after learning this chapter:
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Knowledge gained from this chapter:
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Application of knowledge from this chapter on your daily life:
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Exercises that you like and want to be selected as the outstanding work:
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Contents that you like the most in this chapter (give your reason):
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Chapter 7 Transformations

Indicators and learning areas (32 hours)

Indicators	Learning Areas
M3.2 Gr8/3 Understand and apply geometric transformation through translation, reflection and rotation.	<ul style="list-style-type: none">• Transformation• Translation• Reflection
M3.3 Gr8/4 Identify images from translation, reflection and rotation of models, and explain the method of obtaining the images when given such models and images.	<ul style="list-style-type: none">• Rotation• Isometry• Enlargement
M4.2 Gr8/2 Find coordinates of points and explain characteristics of geometric figures obtained from translation, reflection and rotation on the plane of the rectangular coordinate system.	

Learning Objectives

Students will be taught to:

1. Understand what transformations are.
2. Understand what translations, reflections and rotations are.
3. Solve problems involving translation, reflections and rotations.
4. Understand what isometry and enlargement are.
5. Solve problems involving enlargement.

Learning Outcomes

Students will be able to:

1. Identify a transformation.
2. Identify the object and its image in a transformation.
3. Identify a translation.

4. Determine the image of an object under a translation.
5. Describe a translation.
6. State the properties of a translation.
7. Determine the coordinates of the image or the object under a translation.
8. Solving problems involving translations.
9. Identify a reflection.
10. Determine the image of an object under a reflection in a given line.
11. State the properties of a reflection.
12. Determine the image of an image or the axis of a reflection.
13. Determine the coordinates of the images or the object under a reflection.
14. Describe a reflection.
15. Solve problems involving reflections.
16. Identify a rotation.
17. Determine the image of an object under a rotation.
18. State the properties of a rotation.
19. Determine the image or the centre, angle and direction of a rotation.
20. Determine the coordinates of the image or the object under a rotation.
21. Describe a rotation.
22. Solve problems involving rotations.
23. Identify a rotation.
24. Determine whether a given transformation is an isometry.
25. Form patterns using isometry.
26. Identify an enlargement.
27. Understand scale factors of enlargements.
28. Determine the centre of enlargement.
29. Determine the image of an object, given the centre of enlargement and the scale factor.
30. State the properties of enlargement.

31. Calculate the scale factor and the length of the side of the image/object under an enlargement.
32. Understand the relationship between the areas of the image and its object.
33. Solve problems involving enlargement.

Learning Areas

- Transformation
- Translation
- Reflection
- Rotation
- Isometry
- Enlargement

Teaching and Learning Activities

1st – 2nd hours (Transformation)

1. Using Example 1, explain what transformation is.
2. Test students' understanding of transformation by asking them to try Question 1 in Test Yourself 7.1.
3. Explain what object and image are in transformation.
4. Test students' understanding by asking them to do Example 2 and Question 2 in Test Yourself 7.1.
5. Ask students to work on the exercises in this subtopic on page 76 of the Workbook as their homework.

3rd – 8th hours (Translation)

1. Using Example 3, explain what translation is.
2. Have four students determine translation in Question 1 in Test Yourself 7.2.

3. Guide students to determine the image of an object under a translation by using Example 4.
4. Have four volunteers try Question 2 in Test Yourself 7.2.
5. Emphasize that to describe a translation always starts with a horizontal movement and follows by the vertical movement.
6. Using Example 5, further explain how to describe a translation.
7. Have four volunteers describe the translations in Question 3 in Test Yourself 7.2.
8. Explain the properties of a translation.
9. Test students' understanding by asking them to do Question 4 in Test Yourself 7.2.
10. Using Examples 6 and 7, guide students on how to determine the coordinates of the image or object under a translation.
11. Have students try Questions 5 and 6 in Test Yourself 7.2.
12. Show students how to solve problems involving translation by using Examples 8 and 9.
13. Ask five students to solve the problems in Questions 7 to 9 in Test Yourself 7.2.
14. Ask students to work on the exercises in this subtopic on pages 76 to 79 of the Workbook as their homework.

9th - 14th hours (Reflection)

1. Explain what reflection is.
2. Use Example 10 and have four students try Question 1 in Test Yourself 7.3.
3. Guide students to determine the image of an object under a reflection in a given time by using Example 11. Emphasize the steps taken.
4. Have a volunteer try Question 2 in Test Yourself 7.3. Discuss the answers with them.

5. Explain the properties of a reflection to students and go through Question 3 in Test Yourself 7.3 with them.
6. Using Examples 12 to 14, guide students how to determine the image of an object or the axis of reflection.
7. Have eight students work on Questions 4 and 5 in Test Yourself 7.3. Discuss the answers with them.
8. Show students how to determine the coordinates of the image or the object under a reflection by using Examples 15 and 16.
9. Work out Questions 6 and 7 in Test Yourself 7.3 with students.
10. Emphasize that in order to describe a reflection, the axis of reflection should be stated. Use Example 17.
11. Have four volunteers work on Question 8 in Test Yourself 7.3.
12. Using Example 18, guide students to solve problems involving reflections.
13. Have students work on Questions 9 and 10 in Test Yourself 7.3. Discuss the answers with them.
14. Ask students to work on the exercises in this subtopic on pages 79 to 81 of the Workbook as their homework.

15th – 20th hours (Rotation)

1. Explain what rotation and centre of rotation are.
2. Use Example 19 to further explain rotation.
3. Ask students to try Question 1 in Test Yourself 7.4.
4. Guide students to determine the image of an object under a rotation by using Example 20.
5. Ask four students to try out Question 2 in Test Yourself 7.4.
6. Explain the properties of a rotation and use Question 3 in Test Yourself 7.4 to test their understanding.
7. Using Examples 21 to 23, guide students to determine the image, angle and direction of a rotation.

8. Have students work on Questions 4 and 5 in Test Yourself 7.4.
Discuss the answers with them.
9. Show students on how to determine the coordinates of the image or the object under a rotation by using Examples 24 and 25.
10. Have students try Questions 6 and 7 in Test Yourself 7.4.
11. Emphasize that in order to describe a rotation, the angle, direction and centre of rotation must be stated.
12. Use Example 26 to explain further.
13. Get students to try Questions 8 and 9 in Test Yourself 7.4. Discuss the answers with them.
14. Guide students to solve problems involving rotations by using Example 27.
15. Have a volunteer try Question 10 in Test Yourself 7.4. Discuss the answers with them.
16. Ask students to work on the exercises in this subtopic on pages 82 to 86 of the Workbook as their homework.

21st – 25th hours (Isometry)

1. Explain what isometry means. Use Example 28 and Question 1 in Test Yourself 7.5 to test their understanding.
2. Guide students to determine whether a given transformation is an isometry and to form patterns using isometry.
3. Use Questions 2 and 3 in Test Yourself 7.5 to test their understanding.
4. Ask students to work on the exercises in this subtopic on page 86 of the Workbook as their homework.

26th – 31st hours (Enlargement)

1. Explain what enlargement is. Use Example 29.
2. Test students' understanding by asking them to do Question 1 in Test Yourself 7.6. Discuss the answers with them.

3. Explain to students what scale factor of enlargement is by using Example 30.
4. Have four students try Question 2 in Test Yourself 7.6.
5. Explain how to obtain the centre of enlargement by using Example 31.
6. Test students' understanding by asking them to work on Question 3 in Test Yourself 7.6.
7. Guide students on how to determine the image of an object when the centre of enlargement and the scale factor are given. Use Example 32.
8. Ask six students to work on Question 4 in Test Yourself 7.6. Discuss the answers with them.
9. Explain the properties of enlargement to students. Use Example 33.
10. Have students do Questions 5 and 6 in Test Yourself 7.6.
11. Remind students how the formula for scale factor. Guide them how to calculate the scale factor and the length of the side if the image or object under an enlargement. Use Example 34.
12. Have students work on Questions 7 to 9 in Test Yourself 7.6.
13. Explain to students the relationship between the areas of the image and its object, using Examples 35 and 36.
14. Have students try Questions 10 to 12 in Test Yourself 7.6. Discuss the answers with them.
15. Guide students to solve problem involving enlargement by using Example 37.
16. Test their understanding by asking them to work on Questions 13 and 14 in Test Yourself 7.6.
17. Ask students to work on the exercises in this subtopic on pages 87 to 94 of the Workbook as their homework.

32nd hour (Conclusion)

1. Explain the mistakes shown in the Common Mistake column on page 165.
2. Ensure students understand the terms used in this chapter by referring to the Mathematical Terms column.
3. Revise the lesson using the Quick Revision column on page 166.
4. Randomly select 5 objective questions and 5 subjective questions from the Mastery Practice in the Textbook and have students solve them in the class. Have students work on the rest of the questions at home.
5. Ask students to do the Enrichment Exercises in the Workbook to test their understanding of this chapter as their homework.

Emphasized Characteristics

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

Learning Materials

- Focus Smart Textbook Mathematics M2
- Focus Smart Workbook Mathematics M2
- Grid paper



Learning Outcome Form

Name-Surname:

No.

Mathayom:

Date:

Chapter 7 Transformations

Explanation: Summary of learning outcomes

Chapter 7 Transformations

Contents that you need for teacher to explain further:
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Feeling after learning this chapter:
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Knowledge gained from this chapter:
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Contents that you like the most in this chapter (give your reason):
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Exercises that you like and want to be selected as the outstanding work:
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Application of knowledge from this chapter on your daily life:
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Chapter 8 Statistics

Indicators and learning areas (8 hours)

Indicators	Learning Areas
M5.1 Gr8/1 Read and present data by using pie-charts.	<ul style="list-style-type: none">• Pie charts• Obtaining and interpreting information from pie charts• Solving problems involving pie charts

Learning Objectives

Students will be taught to:

1. Construct pie charts.
2. Obtain and interpret information from pie charts.
3. Solving problems involving pie charts.

Learning Outcomes

Students will be able to:

1. Construct pie charts with given information.
2. Obtain and interpret information from pie charts.
3. Solve problems involving pie charts.

Learning Areas

- Pie charts
- Obtaining and interpreting information from pie charts
- Solving problems involving pie chart
- Equality

Teaching and Learning Activities

1st – 2nd hours (Constructing pie charts)

1. Emphasize the steps to construct a pie chart.
2. Use Example 1 to explain further.
3. Test students' understanding by asking them to try Questions 1 to 3 in Test Yourself 8.1. Discuss the answers with them.
4. Ask students to work on the exercises in this subtopic on pages 99 to 100 of the Workbook as their homework.

3rd – 5th hours (Obtaining and interpreting information from pie charts)

1. Use Example 2 to show how to obtain information from pie charts and interpret the information.
2. Test students' understanding by having them to do Questions 1 and 2 in Test Yourself 8.2. Discuss the answers with them.
3. Ask students to work on the exercises in this subtopic on page 100 of the Workbook as their homework.

6th – 7th hours (Solving problems involving pie charts)

1. Guide students to solve problems involving pie charts by using Examples 3 and 4.
2. Have students work on Questions 1 and 2 in test Yourself 8.3. Discuss the answers with them.
3. Ask students to work on the exercises in this subtopic on pages 101 to 103 of the Workbook as their homework.

8th hour (Conclusion)

1. Explain the mistakes shown in the Common Mistake column on page 182.
2. Ensure students understand the terms used in this chapter by referring to the Mathematical Terms column.
3. Revise the lesson using the Quick Revision column on page 183.

4. Randomly select 5 objective questions and 5 subjective questions from the Mastery Practice in the Textbook and have students solve them in the class. Have students work on the rest of the questions at home.
5. Ask students to do the Enrichment Exercises in the Workbook to test their understanding of this chapter as their homework.

Emphasized Characteristics

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

Learning Materials

- Focus Smart Textbook Mathematics M2
- Focus Smart Workbook Mathematics M2



Learning Outcome Form

Name-Surname:

No.

Mathayom:

Date:

Chapter 8 Statistics

Explanation: Summary of learning outcomes

Chapter 8 Statistics

Contents that you need for teacher to explain further:
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Feeling after learning this chapter:
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Knowledge gained from this chapter:
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Contents that you like the most in this chapter (give your reason):
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Exercises that you like and want to be selected as the outstanding work:
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Application of knowledge from this chapter on your daily life:
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Chapter 9 Probability

Indicators and learning areas (7 hours)

Indicators	Learning Areas
M5.2 Gr8/1 Can explain that, among events described: - which will definitely happen; - which will definitely not happen; - which are more likely to happen.	<ul style="list-style-type: none">• Probability scales• Probability

Learning Objectives

Students will be taught to:

1. Understand what probability scales are.
2. Understand probability.

Learning Outcomes

Students will be able to:

1. Scale a probability on a scale.
2. Understand what an experiment, an outcome and sample space are.

Learning Areas

- Probability scales
- Probability

Teaching and Learning Activities

1st – 3rd hours (Probability scale)

1. Remind students what probability scale is and also the terms that are used to describe how probable the event is.
2. Use Examples 1 and 2 to explain further.
3. Test students' understanding by asking them to try Questions 1 to 4 in Test Yourself 9.1. Discuss the answers with them.

4. Ask students to work on the exercises in this subtopic on page 106 of the Workbook as their homework.

4th – 6th hours (Probability)

1. Explain to students what experiment, outcome, sample space and event are.
2. Guide them by using Examples 3 to 5.
3. Test students' understanding by asking them to try Questions 1 to 6 in Test Yourself 9.1. Discuss the answers with them.
4. Ask students to work on the exercises in this subtopic on pages 107 and 108 of the Workbook as their homework.

7th hour (Conclusion)

1. Explain the mistakes shown in the Common Mistake column on page 193.
2. Ensure students understand the terms used in this chapter by referring to the Mathematical Terms column.
3. Revise the lesson using the Quick Revision column on page 194.
4. Randomly select 5 objective questions and 5 subjective questions from the Mastery Practice in the Textbook and have students solve them in the class. Have students work on the rest of the questions at home.
5. Ask students to do the Enrichment Exercises in the Workbook to test their understanding of this chapter as their homework.

Emphasized Characteristics

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

Learning Materials

- Focus Smart Textbook Mathematics M2
- Focus Smart Workbook Mathematics M2



Learning Outcome Form

Name-Surname:

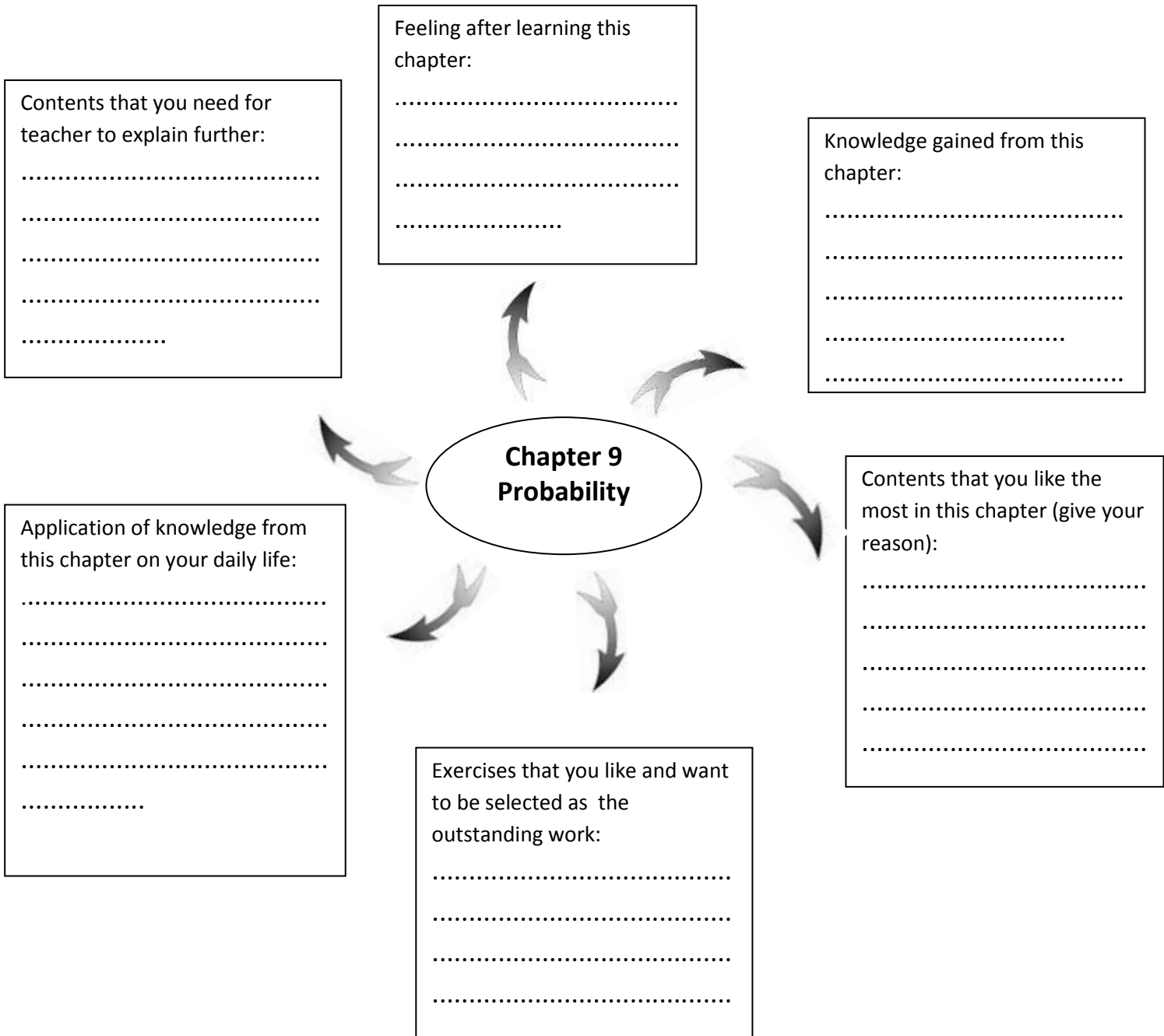
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Date:

Chapter 9 Probability

Explanation: Summary of learning outcomes



Notes: Strand 6: Mathematical Skills and Processes is inculcated in all the chapters appearing in the textbook and workbooks of Primary Education Plus Series. Through them, students will learn to:

- ❖ Apply diverse methods for problem-solving.
- ❖ Appropriately apply mathematical knowledge, skills and processes for problem-solving in various situations.
- ❖ Suitably provide reasoning for decision-making and appropriately present the conclusions reached.
- ❖ Accurately use mathematical language and symbols for communication of concepts and presentation.
- ❖ Link various bodies of mathematical knowledge, and link mathematics with other disciplines.
- ❖ Attain ability for creative thinking.