Learning Plan (Area and Perimeter of shapes)							
Subject	*Mathematics*	**Week**	*19*	**Duration**	*4 HRS*	**Form**	*1*
Strand	*Geometry Around Us*	**Sub-Strand**	*Measurement*				
Content Standard	*Demonstrate conceptual understanding of the measurement of perimeter and area of and quadrilaterals.*						
Learning Outcome(s)	*Identify and compare referents for SI and imperial area measurements, estimate perimeter and area of 2-D shapes and solve problems that involve of a given regular, composite, or irregular 2-D shapes.*						
Learning Indicator(s)	*a) Solve problems that involve identifying and comparing referents for SI and imperial area measurements of regular, composite and irregular 2-D shapes including decimal and fractional measurements and verify the solutions.* *b) Estimate the perimeter and area of a given regular, composite or irregular 2-D shapes.* *c) Solve a contextual problem that involves the perimeter and area of a regular, a composite or an irregular 2-D shape.*						
Essential Question(s)	*(A) How are referents for measuring used as benchmarks for comparing and quantifying lengths, distances, and other quantities?* *(B) How do different systems of measurement, such as the metric system and the imperial system, utilize referents to establish standardized units for measuring length, mass, volume, and time?* *(C) How can the concept of perimeter be applied to solve problems involving the measurement, design, and construction of geometric figures in real – world scenarios?*						
Pedagogical Strategies	*Experiential Learning, Problem – Based Learning, Collaborative Learning.*						
Teaching & Learning Resources	*Calculator, whiteboard, marker, Mathematics Teacher Manual (Page 49 – 56), NTS handbook, Concise Core Mathematics Textbook (Page 479 – 511), Rulers (Imperial and Metric), Tape Measures, Conversion Charts, Visual Aids showing referents, Geometric shape cut – outs, Case studies on the application of these shapes, Real – life images and videos,*						

Key Notes on Differentiation

Learning Tasks:

a) Learners solve problems on finding the perimeter and area of kites, rhombus, parallelogram and trapezium.

b) Learners solve real-life problems on perimeter and area of 2-D shapes

Pedagogical Approach 1: *Experiential learning:*

Learners to explore the immediate school environment to investigate referents for the measuring various items.

To differentiate:

a) Encourage shy learners to share their findings from the investigations.

b) Ensure full participation by differentiating the manner in which students go about their estimations and presentation formats. Allow for oral, written as well as use of IT tools for presentations.

Pedagogical Approach 2: Problem-based learning.

Learners to investigate the perimeter and area of kites, parallelogram, rhombus, and trapezoids using geodata/graphs. Learners to solve problems, using formulae for determining the perimeter/area of kites, parallelogram, rhombus, and trapezoids. Learners may use digital mathematics tools where applicable and available.

To differentiate:

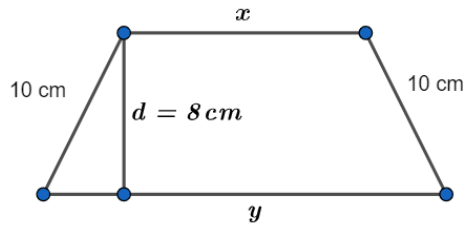
a) *Provide additional resources such as visual aids, manipulatives, or reference materials to assist students who may require extra support in understanding the concept of equal vectors. This can help make the task more accessible to all learners regardless of their ability level.*

b) *Instead of assigning fixed mixed-ability groups all the time, allow for flexibility in grouping based on students' strengths and weaknesses. You can observe during class activities and then regroup students, accordingly, ensuring that each group has a mix of abilities and can support one another effectively.*

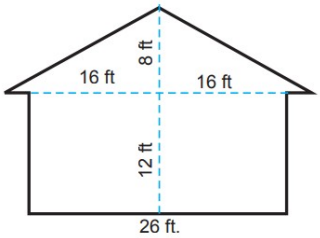
Key assessment

a) Assessment Level 2

The perimeter of the given trapezium is 104 cm. Find its area.



b) Assessment Level 3



Miss. Tackie wants to paint her house. To buy paint, she must know the area. What's the area of one side of Miss. Tackie's house?

c) Assessment Level 3

Jamila is building a deck outside her house with a rectangular area that has outer dimensions of 8m x 6m. She wants to have decorative floor tile patterns in a parallelogram shape inside the deck. Each parallelogram tile has one side measuring 1.2m and a perpendicular height of 0.8m against that side.

i. *What is the area of each parallelogram tile?*

ii. *If Jamila covers the entire inner deck area with these tiles, how many full tiles would she need?*

Keywords	*Metric System, Imperial System, Referents, Area, Perimeter, Kite, Rhombus, Parallelogram, Trapezium, Diagonals, Base, Height.*

Lesson 1

Main Lesson drawing on Concepts, Skills, and Competencies to reinforce as in the Subject Teacher Manual

Teacher Activity	***Learner Activity***

Starter ***Activity (e.g., 10 minutes)***

Teacher Activity:

Using PowerPoint illustration or slides, tell the history of "Syst ème Internationale d' Unit és", SI (Metric) and Imperial systems of measurement.

Learner Activity:

Learners pay attention, listen to the history of the two systems of measurement and take key notes.

Introductory Activity (e.g., 15 minutes)	***Introductory Activity***
*Using talk for learning, define REFERENT (**as a concrete object that that approximates a measurement)**, give examples of referent for both Imperial and Metric units and show their respective images.*	*Learners pay attention, take key notes, asks questions for clarity and understanding.*
Activity 1 (e.g. 35 minutes)	***Activity 1***
Using talk for learning, Explain the differences between the Imperial and Metric Systems, highlight the common units of measurement used in each system and show examples of how these units are used in different contexts (e.g., miles vs. kilometres, pounds vs. kilograms)	*Learners pay attention, take key notes, asks questions for clarity and understanding.*
Activity 2 (e.g., 50 minutes)	***Activity 2***
❖ *Using talk for learning, demonstrate how to convert between units in the Imperial and Metric systems using examples.* ❖ *Using talk for learning, explain the importance of conversion in real – world contexts, such as international trade, Science, and engineering.* ❖ *In mixed ability and gender groupings, provide learners with objects to measure using both imperial and metric units.*	• *Learners follow along with the demonstration of conversion between units in the imperial and metric systems.* • *Learners take keynote on the impact and influence, conversion has on real – world contexts, such as international trade, Science, and engineering.* • *Learners measure objects given to them using both systems, record and compare results to understand the practicality of each system.*
***Hint:** Guide learners through the process of estimating, measuring, and recording their findings*	

Assessment DoK aligned to the Curriculum and Subject Teacher Manual

Assessment Level 3:

1. Estimate the length of the following objects using a referent and explain how you determined the answer.
(a) height of a door

(b) width of a whiteboard
(c) length of a keyboard
(d) height of a light switch
(e) height of an electrical outlet

2. Estimate the total distance you would walk during a typical day at school. In groups of two or three, use referents to explore your individual routes throughout the building for a particular day in your school cycle. Once completed, share your results with the others in your class and discuss the strategies used to obtain your distances.

3. Which distance below is the longest?
(A) 0.7 in. (B) 1000 yd. (C) 1km (D) 910m

4. The GPS in your car is set in miles. It estimates the distance to your destination to be 188 miles.
(a) How many kilometres are you from your destination?
(b) If the speed you are traveling is registered as 45 mph, how many km/h is this?
(c) Given this information, what is the estimated time of arrival (ETA) if the current time is 10:20 a.m. and you maintain your average speed?

Lesson Closure
In completing this part, refer to the Essential Questions to check that learning has taken place.

Activity: 10 minutes

(a) Conclude by summarizing key points discussed during the lesson about how different measurement systems work together in our daily lives.

(b) Encourage learners to think about situations where they might need to convert between these two systems.

Reflection & Remarks

(a) Assess the effectiveness of the pedagogical strategies used.

(b) Note which areas were challenging for students so adjustments can be made for future lessons (e.g., more practice on specific types of problems).

Lesson 2

Main Lesson drawing on Concepts, Skills, and Competencies to reinforce as in the Subject Teacher Manual

Teacher Activity	***Learner Activity***

Starter ***Activity (e.g., 10 minutes)***

Teacher Activity:

Display various images of kites, rhombus, parallelograms, and trapeziums found in real – life (e.g., floor tiles, kites, architectural designs) and ask learners to identify the shapes and discuss where they have seen these shapes in their surroundings.

Learner Activity:

Learners participate by identifying shapes and sharing their observations.

Introductory activity (e.g., 10 minutes) *Introduce the concept of area and perimeter by revisiting basic shapes like rectangles and triangles and then transition to discussing the properties of kites, rhombus, parallelogram, and trapezium.*	***Introductory activity*** *Learners take notes and ask clarifying questions.*
Activity 1 (e.g., 25 minutes) ❖ *Using talk for learning, present and derive the formulas for calculating the area and perimeter of each shape.* ❖ *Solve examples on the board, demonstrating the step – by – step process for each shape and assign other examples to learners to work on them.*	***Activity 1*** • *Learners record the formulas and key points discussed.* • *Learners follow along with the demonstration and then work individually on example problems assigned to them.*
Activity 2 (e.g., 25 minutes) ❖ *In mixed ability and gender groupings, present each group a set of different shaped cut-outs (kites, rhombuses, parallelograms, and trapeziums), task each group to use referents for both imperial and metric systems, to measure the dimensions of the provided cut – outs shapes and then calculate the area and perimeter for each shape using the formulas discussed earlier.* ***Hint:*** *Teacher moves around to supervise and offer help where necessary.*	***Activity 2*** • *Learners in each group receives a set of different shaped cut – outs, measure their dimensions and calculate the area and perimeter of each shape using the already discussed formulas.*
Activity 3 (e.g. 40 minutes) ❖ *Solve problems that involve identifying and comparing referents for SI and imperial area measurements of regular, composite, and irregular two-dimensional shapes including decimal and fractional measurements and verify solutions.*	***Activity 3*** • *Learners follow along with the solutions to the problems, take key notes on each step and ask questions to clear any doubt.*

❖ *In mixed ability and gender groupings, assign similar problems to learners.* ***Hint:*** *Teacher moves around to supervise and offer help where necessary.* ❖ *Using Case Studies or videos, discuss how the area and perimeter of these shapes (Kite, Rhombus, Parallelogram and Trapezium) are used in different professions, such as architecture and engineering.*	• *Learners in their respective groups collaborate to solve the assigned problems and share their solutions to the class.* • *Learners pay attention and contribute to the discussion.*

Assessment DoK aligned to the Curriculum and Subject Teacher Manual

Assessment Level 1:

1. Write down the formulas each for the area and perimeter of a kite, rhombus, parallelogram, and trapezium.

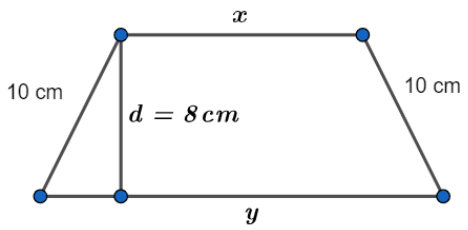
Assessment Level 2:

1. Calculate the area and perimeter for each shape given specific dimensions:
(a) Kite with diagonals of lengths 10cm and 8cm.
(b) Rhombus with side length of 6cm.
(c) Parallelogram with base of 5cm and height of 4cm.
(d) Trapezium with parallel sides measuring 7cm and 5cm, height of 3cm.

2. A rhombus has sides measuring 5m each and one angle measuring 60^o*. Calculate its area in square metres* (m^2) *and convert it to square feet* (ft^2)*.*

3. A parallelogram has a base measuring $8/3\,m$ *and height measuring* $4/5\,m$*. Calculate its area in square metres* (m^2)*.*

4. The perimeter of the given trapezium is 104 cm. Find its area.



Assessment Level 3:

1. A kite has diagonals of 6cm and 8cm. If the length of one diagonal is doubled, how does this affect the area of the kite?

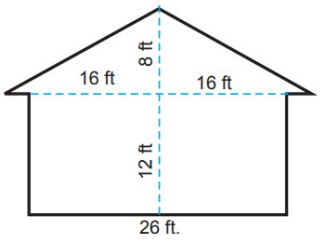
2. Compare the areas and perimeters of two parallelograms, one with a base of 10cm and height of 6cm, and another with a base of 12cm and height of 5cm.

3. Jamila is building a deck outside her house with a rectangular area that has outer dimensions of 8m x 6m. She wants to have decorative floor tile patterns in a parallelogram shape inside the deck. Each parallelogram tile has one side measuring 1.2m and a perpendicular height of 0.8m against that side.

i. What is the area of each parallelogram tile?

ii. If Jamila covers the entire inner deck area with these tiles, how many full tiles would she need?

4.



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Assessment Level 4:

1. A landscape architect is designing a park that includes various sections shaped like kites, rhombuses, parallelograms, and trapeziums. The total area available for landscaping is limited to an acre (approximately $4046.86\,m^2$*). The architect needs to allocate space efficiently among these shapes while ensuring they meet specific aesthetic requirements. Assuming he decides on allocating areas as follows based on design preferences:*
Kite section should cover about one – fifth,
Rhombus section should cover one – fourth,
Parallelogram section should cover one – third,
Trapezium section should cover remaining space.
Calculate how much area will be allocated to each shape.

2. A park designer needs to create a kite – shaped garden. The garden must have an area of 100 square metres, and the lengths of the diagonals must be in the ratio 3:4. Design the garden by calculating the required dimensions and determine the length of fencing required if the sides of the kite are all equal.

Lesson Closure

In completing this part, refer to the Essential Questions to check that learning has taken place.

Activity: 10 minutes

(a) Review the key properties and formulas of the shapes (Kite, Rhombus, Parallelogram and Trapezium) and their applications.

(b) Assign homework involving the area and perimeter of these shapes in more complex contexts.

(c) Encourage learners to reflect on how the lesson relates to real – life situations.

Reflection & Remarks

(a) Reflect on how well the learners grasped the concepts and participated in group work.
(b) Note any adjustments needed for future lessons, such as additional examples or differentiated instruction for learners who need more support.