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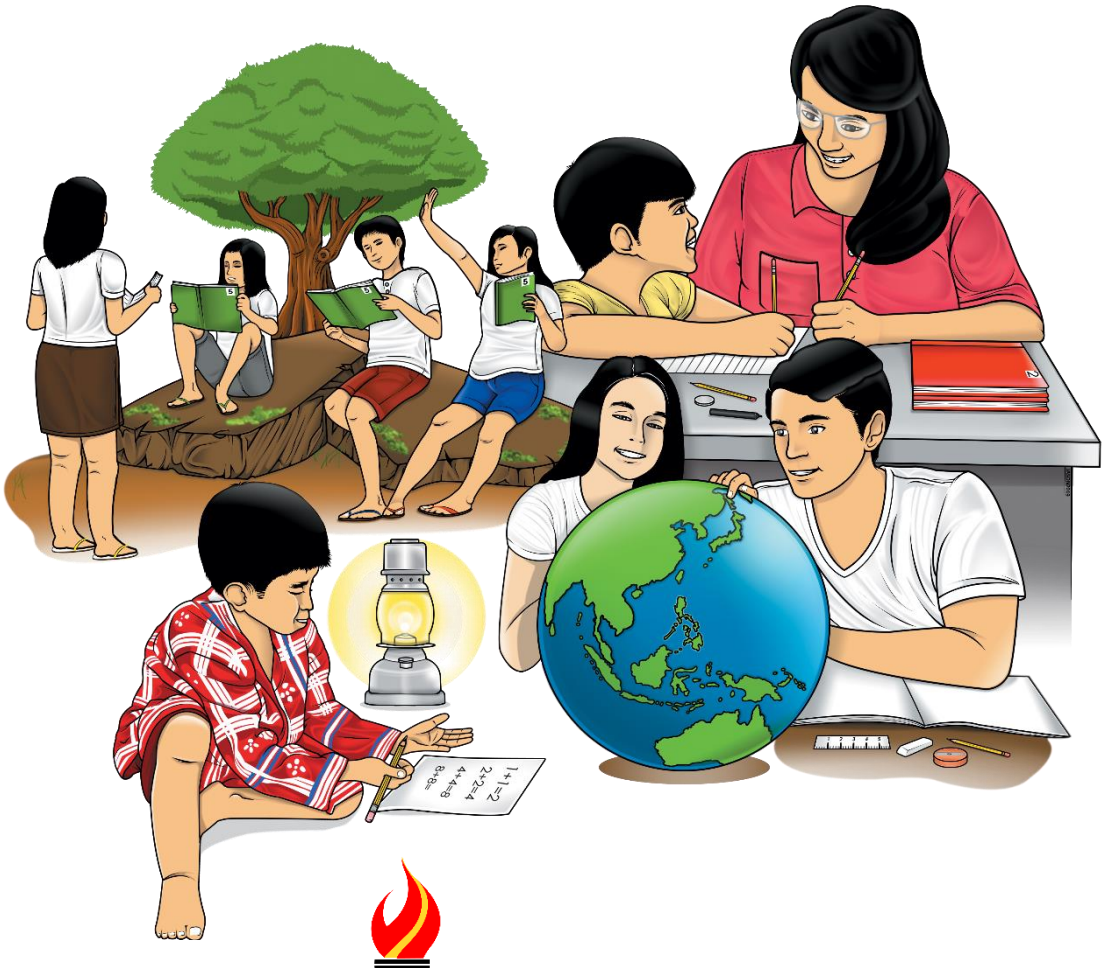
Mathematics

Quarter 3 – Module 10: Differentiating Perimeter from Area



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Mathematics

Quarter 3 – Module 10: Differentiating Perimeter from Area

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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

Area and perimeter are two important concepts in mathematics. Both have practical applications and are used in our day-to-day lives. Perimeter is the distance around a figure while area is the measure of the surface enclosed within a region.

Different shapes may have the same perimeter but different areas, or they may have the same area but different perimeters. Still, there are different shapes having the same area and perimeter.

At the end of this module, you should be able to differentiate perimeter from area.

What I Know

Read and answer each item carefully. Choose the letter of the correct answer.

1. For a closed figure, what do we look at when we want to know its area?
   a. outside the closed figure
   b. its outline
   c. inside the closed figure
   d. either outside or inside the closed figure

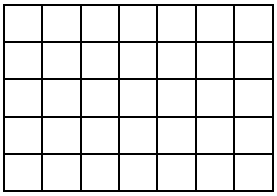
2. If you have to build a fence around your backyard, what will you measure to find the amount of fencing material you would need?
   a. side b. perimeter c. area d. volume

3. For a closed figure, what do we look at when we want to know its perimeter?
   a. its corners
   b. its outline
   c. its inside/surface
   d. either outside or inside the closed figure

4. Mang Ramon wants to surround his rectangular flower garden with a wooden fence. What does he need to measure to find how much wooden fence he needs?
   a. area
   b. volume
   c. perimeter
   d. side

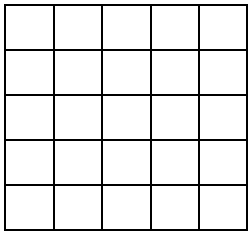
5. Which of the following statements best describes the relation between the number of linear units along the outline of a figure and the number of square units enclosed in its outline?
   a. They are the same.
   b. The number of linear units is greater than the number of square units
   c. The number of linear units is less than the number of square units.
   d. There is no relation as the number of linear units along the outline of a figure may be less than, equal to, or greater than the number of square units enclosed within the outline of the figure.

6. The shape shown has an area of 35 square units. What is its perimeter?
   a. 30 units
   b. 20 units
   c. 25 units
   d. 24 units



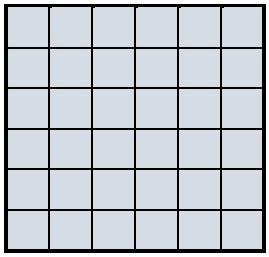
7. What is the area of a square with a perimeter of 20 units?

a. 20 sq units
b. 25 sq units
c. 30 sq units
d. 35 sq units



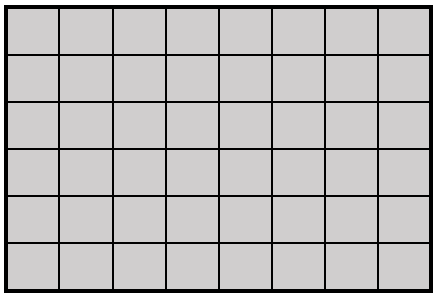
8. What is the area of a square with a perimeter of 24 units?

a. 34 square units
b. 35 square units
c. 32 square units
d. 36 square units



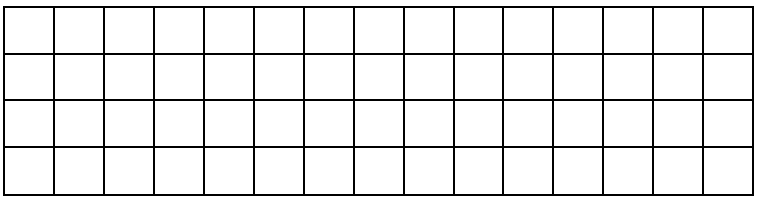
9. The shape shown has an area of 48 square units. What is its perimeter?

a. 26 units
b. 28 units
c. 30 units
d. 36 units



10. What is the perimeter of the rectangle below which has an area of 60 square meters?

a. 38 meters
b. 40 meters
c. 36 meters
d. 42 meters



Are you done answering?
If yes, time to check. Please go to page 14 for the ***Answer Key***.

Lesson 1 Differentiating Perimeter from Area

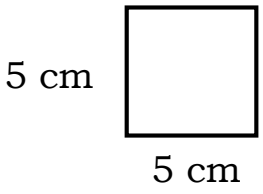
What's In

A. Matching type: Match the terms in Column A with their descriptions in column B. Choose the letter of the correct answer.

A	B
_____1. side	a. the longer side of a rectangle
_____2. length	b. a line that is part of the outline of a geometric figure
_____3. width	c. the shorter side of a rectangle

B. Find the perimeter of each figure. Use the formula.

4.



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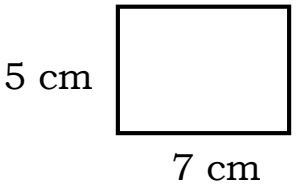
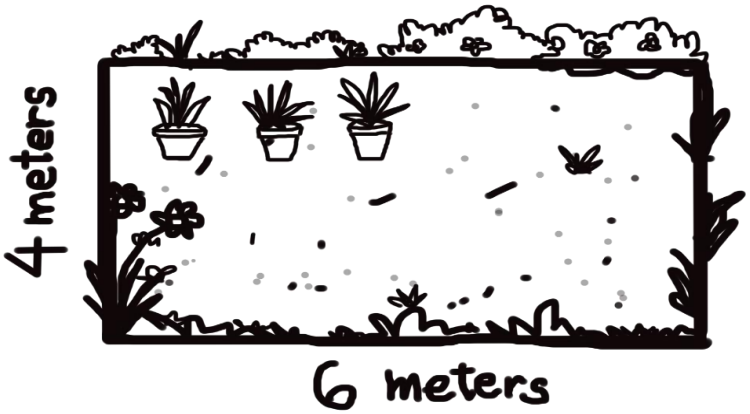


Are you done answering?
If yes, time to check. Please go to page 14 for the ***Answer Key***.

What's New

Teacher Pat wants to know how many square meters of carpet grass will be needed to cover the 6 meters by 4 meters rectangular garden in the school yard and the exact length of fencing materials needed to enclose it. She doesn't want to waste money by ordering more than the materials needed or by ordering too little. She asked Criselda to find the area and the perimeter of the garden. But the problem is, she cannot differentiate perimeter from area.

Below is an illustration of the rectangular garden. Let us help Teacher Pat solve the problem.



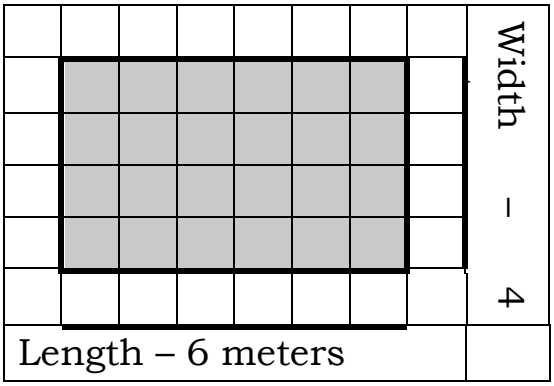
What is It

Before we continue with the discussion, let us first understand the meaning of perimeter and area of a certain shape or plane figure.

Perimeter is the distance around a closed figure. If the figure is formed by straight lines, the perimeter is the sum of all the lengths of these lines. The straight lines are referred to as the **sides** of the figure.

Area is the measure of the region or surface a figure encloses.

To better understand these two concepts and their difference, let's use the figure below.



The figure is a graph/grid sheet representation of the rectangular garden measuring 6 meters by 4 meters.

The outline or border is where Teacher Pat is to put the fence. The shaded portion is the part of the garden that needs to be covered with carpet grass.

The whole length of the outline or the border is the **perimeter** of the rectangular garden and is also the length of the fence Teacher Pat needs to enclose the garden.

To find its perimeter, count the number of linear units along the border or outline of the rectangle. Clearly, there are 20 linear units along the outline of the rectangle. Therefore, the perimeter of the rectangular garden is 20 units or 20 meters.

Observe that we could have gotten the perimeter of the rectangular garden by adding twice the length and twice the width. Twice 6 meters is 12 meters; and twice 4 meters is 8 meters. The sum is, of course, 20 meters.

While we have used the term perimeter here to refer to the distance around the closed figure, it may also be used to refer to the outline or the border of the closed figure.

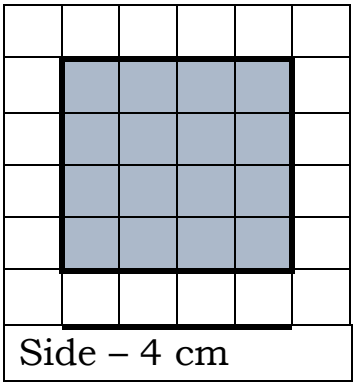
The **area** of this rectangular garden, on the other hand, is the amount of surface enclosed within the rectangle. For Teacher Pat, this is what needs to be covered with carpet grass.

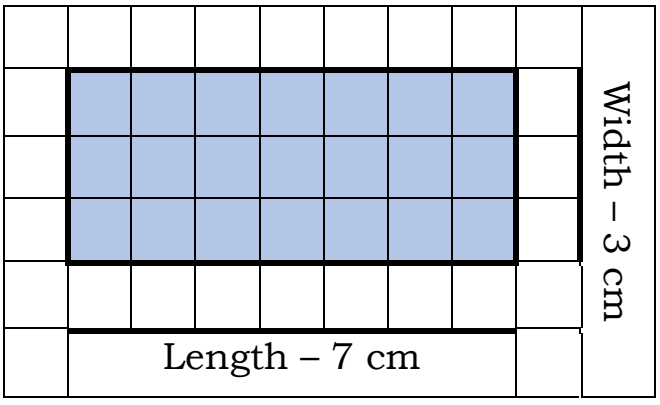
To find the area of the garden, count the number of square units enclosed within the rectangle. We can count 24 square units enclosed within the rectangle. Therefore, the area of the rectangular garden is 24 square units, or 24 square meters.

Observe that we could have gotten the area of the rectangular garden by multiplying its length and width. The product of 6 meters and 4 meters is, of course, 24 square meters.

Teacher Pat therefore needs 20 meters of fence to enclose the garden and 24 square meters of carpet grass to cover it.

Let us look at the square and the rectangle below as we try to observe how their perimeters and areas relate to the length of their sides.





The table below shows us the lengths of the sides of the figures and their perimeter and areas.

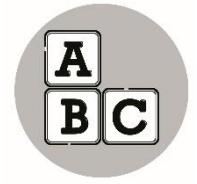
Figure	**Side**	**Length**	**Width**	**Perimeter**	**Area**
Square	4 cm	-	-	16 cm	16 cm
Rectangle	-	7 cm	3 cm	20 cm	21 cm

Observe that:

- For the **square:** The **perimeter** is **4 times the length of one side**. This is because all its four sides are of the same length. The **area**, on the other hand, is the **square of the length of one side**.

- For the **rectangle**, the **perimeter** is the **sum of twice its length and twice its width**. This is because the two pairs of opposite sides have the same length. The **area**, on the other hand, is the **product of the length and width**.

Are the above observations true for all squares and rectangles? Why?



What's More

Differentiate perimeter from area by filling-in the table below using the different phrases and statements that follow.

Basis	**Area**	**Perimeter**
Meaning	1.	2.
Unit of measurement	3.	4.
No. of dimensions	5.	6.
Example	7.	8.

a. Amount of surface enclosed within a closed figure.
b. Square units
c. Linear units
d. Distance around a closed figure
e. One
f. Two
g. The number of square units of grass to cover a garden
h. Length of fence required to enclose a garden.

Are you done answering?
If yes, time to check. Please go to page 14 for the ***Answer Key***.

What I Have Learned

The differences between perimeter and area are:

- Perimeter is the distance around a closed figure or the length of the outline of a closed figure. Area is the measurement of the amount of surface enclosed within the closed figure.
- Perimeter is expressed in linear units; area in square units
- Perimeter involves only one dimension; area involves two dimensions.

What I Can Do

Write A if the statement talks about area and P if it talks about perimeter.

1. Aling Juana wants to build a fence around her lemon orchard.

2. Mang Mario covered his living room with wooden tiles.
3. Rissa wants to put some lace around the edges of her neckerchief.
4. The interior decorator painted the entire wall in his favorite color.
5. Darrel surrounded the flower garden with bamboo sticks.
6. She covered the stain on the table with a fresh coat of paint.

Are you done answering?
If yes, time to check. Please go to page 14 for the ***Answer Key***.

Assessment

Read each item carefully. Choose the letter of the correct answer.

1. Which of the following statements best describes the difference between perimeter and area?
    a. Area is the measurement of the surface enclosed within a closed figure while perimeter is the distance around the closed figure.
    b. Area is the distance around a closed figure while perimeter is the measure of the surface enclosed within the closed figure.
    c. Area is measured by counting the linear units along the outline of a closed figure while perimeter is measured by counting the number of square units enclosed in the figure.
    d. Area and perimeter have the same measurement.

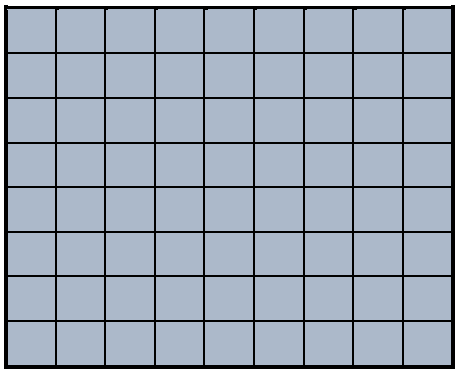
2. How does area differ from perimeter when it comes to measurement?
    a. Measurement of perimeter is expressed in square units while area is expressed in linear units.
    b. Measurement of area is expressed in square units while perimeter is expressed in linear units.
    c. Area, in terms of the number of square units, is always less than perimeter, in terms of linear units.
    d. Area, in terms of the number of square units, is always equal to perimeter, in terms of the number of linear units.

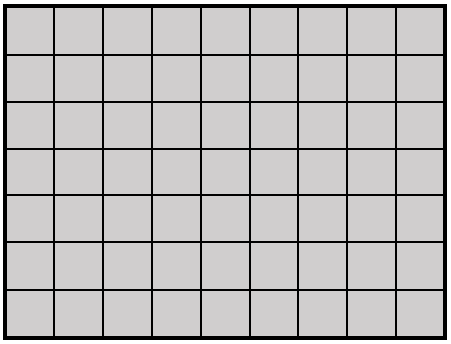
3. How does area differ from perimeter when it comes to dimensions?
    a. Perimeter has two dimensions while area has only one dimension.
    b. Both perimeter and area have two dimensions.
    c. Perimeter has two dimensions while area has no dimensions.
    d. Perimeter has only one dimension while area has two dimensions.

4. Which of the following statements uses the measurement of both area and perimeter?
    a. the capacity of a box and the length of a table.
    b. the length of the stage and the width of the classroom.
    c. space amount of surface covered by the garden and the length of fence required to enclose the garden.
    d. the height of the building and the length of the door.

Find the area and the perimeter of the following figures by counting the corresponding units.

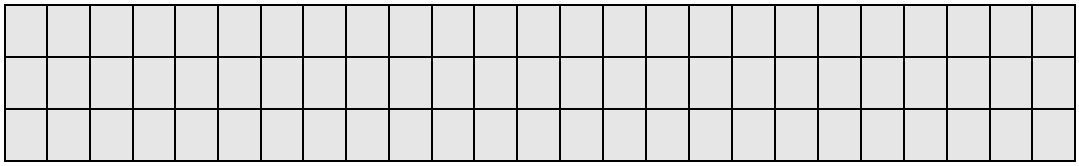
1 linear unit —— 1 square unit ⊣□





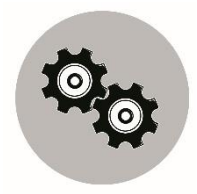
5. Area _____
6. Perimeter _____

7. Area _____
8. Perimeter _____



9. Area _____
10. Perimeter _____

Are you done answering?
If yes, time to check. Please go to page 14 for the ***Answer Key***.



Additional Activities

Using a graphing paper,

1. Draw a square which is 11 units on each side and showing the number of square units enclosed.
2. Determine the perimeter by counting the linear units along the outline of the square; and the area by counting the square units enclosed within the outline of the square.
3. Draw any rectangle and indicate its length and width.
4. Determine the perimeter and the area of your rectangle by counting the linear units along its outline and the square units within the outline of the rectangle.
5. Write the relationship between the length of a square and its perimeter and also its area.

Are you done answering? If yes, time to check. Please go to page 14 for the ***Answer Key***.

Answer Key

What I Know

1. c
2. b
3. b
4. c
5. d
6. d
7. b
8. d
9. b
10. a

What's In

1. b
2. a
3. c
4. 28 m
5. 30 m

Basis for Comparison	**Area**	**Perimeter**
Meaning	Amount of surface enclosed in a closed figure	Distance around a figure.
Unit of measurement	Square units	Linear unit
No. of dimensions	Two	One
Example	The number of square units of grass to cover a garden	Length of fence required to enclose the garden.

What I can Do

1. P
2. A
3. P
4. A
5. P
6. A

Assessment

1. a
2. b
3. b
4. c
5. 72 sq m
6. 34 m
7. 63 sq m
8. 32 m
9. 75 sq m
10. 56 m

Additional Activities

1. (Illustration or drawing of a square that has 11 units on each side.)
2. Area = 121 sq units
   Perimeter = 44 units

3-4. (answers may vary)

5. The perimeter of a square is four times the length of a side of the square. The area of a square is the length of a side of the square multiplied by itself.

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