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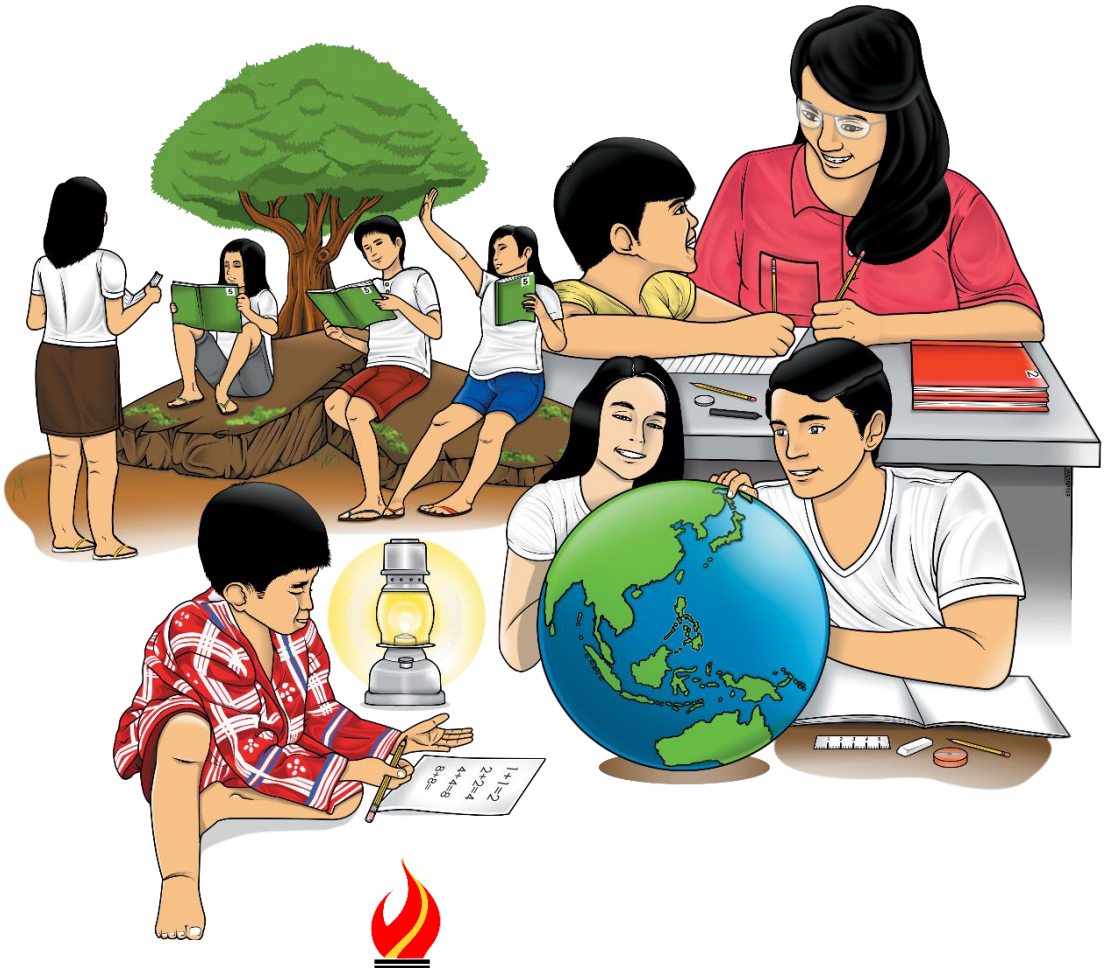
Mathematics

Quarter 3 – Module 9:
Solving Routine and Non-routine Problems Involving Perimeter



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Mathematics – Grade 4
Alternative Delivery Mode
Quarter 3 – Module 9: Solving Routine and Non-routine Problems Involving Perimeter
First Edition, 2020

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Mathematics

Quarter 3 – Module 9:
Solving Routine and Non-routine Problems Involving Perimeter

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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

Word problem involving perimeter is just an application of basic math skills but there are also some problems involving perimeter that are complicated. We have to follow a step by step solution, make an illustration, choose a formula and make use of different strategies to come up with the right answer.

After going through this module, you are expected to: solve routine and non-routine problems in real-life situations involving perimeter of squares, rectangles, triangles, parallelograms, and trapezoids.

What I Know

A. Read the following items carefully. Solve each problem and choose the letter of your answer. Write your answers on a separate sheet of paper.

1. One side of an equilateral triangular park measures 20 m. What is the perimeter of the triangular park?
   A. 40 m B. 50 m C. 60 m D. 70 m

2. Francis walked around a small rectangular garden. The rectangular garden is 8 m long and 7 meters wide. What is the perimeter of the rectangular garden?
   A. 38 m B. 30 m C. 23 m D. 15 m

3. Jonel enclosed his vegetable garden with a fence. The four sides of the garden measures 10, 15, 17 and 9 meters. How long will be the fence?

   A. 25 m B. 32 m C. 42 m D. 51 m

4. One side of a square playground of Bacon West Central School in Sorsogon City, measures 35 meters. How many meters of chicken wire are needed to enclose the playground?

   A. 70 m B. 105 m C. 140 m D. 175 m

5. Josel bought a lot whose sides measure 23 m, 18 m, 23 m, and 18 m. What is the perimeter of the lot he bought?

   A. 82 m B. 75 m C. 54 m d. 41 m

B. Read the following items carefully. Solve the following problems by identifying what is asked, the given facts, the needed operation, the solution and the answer.

6. Rose will plant tomatoes 1 meter apart along the edges of an 8 m by 7 m rectangular garden. How many tomato plants are needed by Rose?

7. An equilateral triangle has a perimeter equal to the perimeter of a rectangle whose length is 15 cm and whose width is 9 cm. Find the measurement of the sides of the equilateral triangle.

8. The width of a rectangular swimming pool is 15 m. The length is twice the width. Find the perimeter of the pool.

9. A rectangle with a length of 80 cm and a width of 50 cm is to be cut into a square and a rectangle. Find the perimeter of the rectangle.

10. The floor plan of Mr. Cruz' house has the shape of two squares with sides 15 m and 6 m, respectively as shown in the given figure below. What is the perimeter of his floor plan?

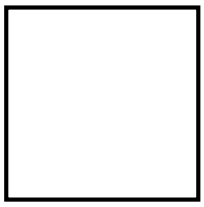
Are you done answering?
If yes, time to check. Please go to page 16 for the ***Answer Key***.

Lesson 1 Solving Routine and Non-routine Problems Involving Perimeter

What's In

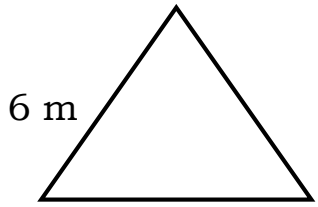
Find the perimeter of each figure. Write your answers on a separate sheet of paper.

1. 10 cm



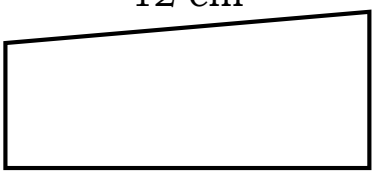
P = _____ cm

2.



P = _____ m

3. 12 cm



10 cm

P = _____ cm

4. 8 m

P = _____ m

5. 7 cm

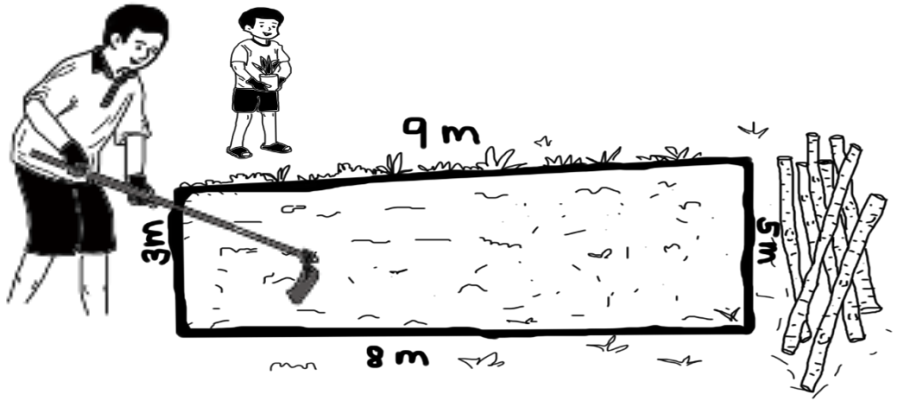
P = _____ cm

Are you done answering?
If yes, time to check. Please go to page 16 for the ***Answer Key***.

What's New

Read the problem below and answer the questions that follow on a separate sheet of paper.

The Barangay Chairman of San Isidro encouraged each household to participate in the Community Project "Clean and Green Program." The Dechavez family decided to convert their vacant lot into a vegetable garden. They decided to surround it with barb wires to protect the plants from stray animals. How many meters of fencing materials will they buy given the measurement of the vacant lot below.



What does the problem ask for?
What shall we do to solve the problem?
What is the answer to the problem?

What is It

The problem presented is an example of a **Routine Word Problem. Routine problems** are simple practical word problems.

To analyze and solve the given problem, we will use the 4-step plan.

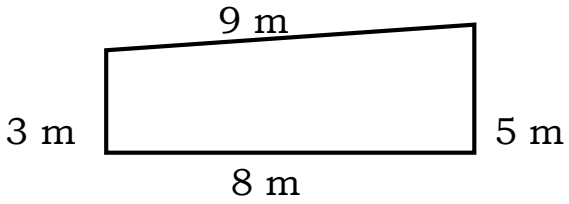
A. Understand the Problem.

1. Know what is asked in the problem.
   The distance around the vacant lot.

2. Know the given facts or data.
   Measurement of the sides: 3 m, 9 m, 8 m, 5 m

B. Plan

1. Draw or illustrate to visualize the problem. *(optional)*



3. Determine the operation or formula to use.
   Formula: P = s + s + s + s

C. Solve to carry out the plan.

Solve using the formula.

P = s + s + s + s
= 3 m + 9 m + 8 m + 5 m
P = 25 m

D. Check and Look back.

What is the final answer to the problem?

Answer: The perimeter or the fencing materials needed is 25 m.

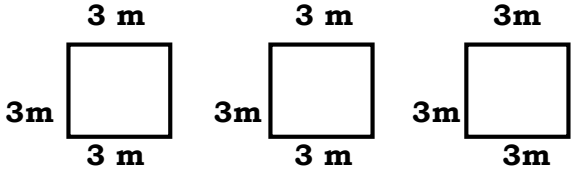
Let us study another example, a non-routine problem.

One side of a square table measures 3 m. If three tables are placed end to end, what will be the perimeter of the new table?

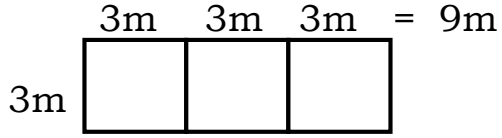
A non-routine problem is any complex problem that requires some degree of creativity to solve. Some routine problems require multiple steps. These problems can also be solved in multiple ways or using different strategies.

Strategies that can be used include: Listing/Table Method, Guess and Check, Drawing/Diagram, Using patterns, etc.

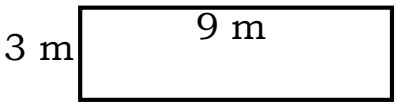
- Let us solve the problem by drawing or illustrating the picture.



- By placing it end to end, it would look like this:



- The new table formed is rectangular in shape, the new dimensions are: length = 9 m, width = 3 m

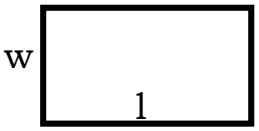
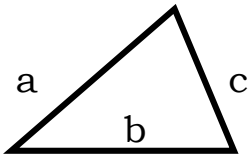
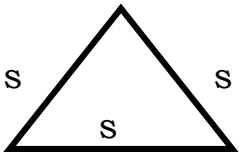
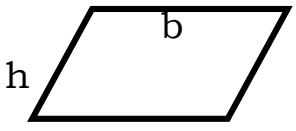


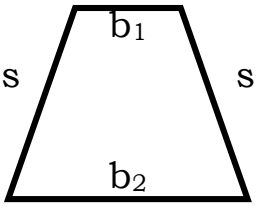
- Let us substitute the given values in the formula:

  P = 2 x (l + w)
  = 2 x (9 m + 3 m)
  = 2 x 12 m
  P = 24 m

Therefore, the perimeter of the new table is 24 m.

Here are the equations/formulas for the Perimeter of different plane figures.

Figures	Formula
Square	P = s + s + s + s or P = 4 x s or P = 4s
 Rectangle	P = l + l + w + w P = (2 x l) + (2 x w) P = 2l + 2w
 Triangle	P = a + b + c
 Equilateral Triangle	P = s + s + s or P = 3 x s or P = 3s
 Parallelogram	P = b + b + h + h or P = (2 x b) + (2 x h) or P = 2b + 2h



Trapezoid

$P = b_1 + b_2 + s + s$

Let's try another sample problem.

Raymund uses his free time in reading books. If his rectangular book has a length of 20 cm and a width of 15 cm, what is the perimeter of the book?

1. What is asked?
   The perimeter of the book.

2. What are the given facts?
   length is 20 cm, width is 15 cm

3. What is the operation or formula to be used?
   Multiplication & Addition: P = 2 x (l + w)

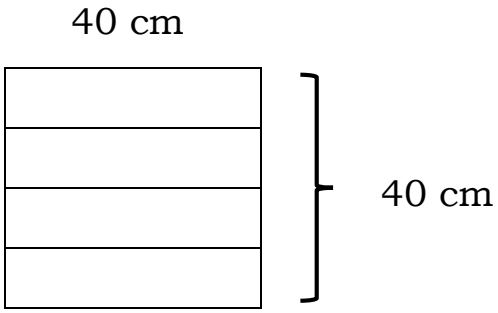
4. Show your solution.
   P = 2 x (l + w)
   = 2 x (20 cm + 15 cm)
   = 2 x 35 cm
   P = 70 cm

5. What is the final answer?
   The perimeter of the book is 70 cm.

Let us solve the next problem using illustration.

A square is formed by 4 identical rectangles. Find the perimeter of each rectangle if the perimeter of the square is 160 cm.

Illustration and Solution:



side of square = 160 ÷ 4
= 40 cm

Width of each rectangle = 40 ÷ 4
= 10 cm

Perimeter of the rectangle = 2 x (l + w)
= 2 x (40 cm + 10 cm)
= 2 x 50 cm
= 100 cm

Answer: The perimeter of each rectangle is 100 cm.

What's More

Solve the following problems. Use the four-step plan to solve the problems. Use a separate sheet of paper for your answers.

1. The four sides of a trapezoid measures 30 cm, 20 cm, 45 cm and 20 cm. What is the perimeter of the trapezoid?

2. Narlyn jogs around a rectangular park that measures 125 m by 80 m. How far is the distance covered by Narlyn if she goes around the park twice?

3. Mr. Reyes puts a rectangular fence around his *kalamansi* orchard to keep stray animals from destroying his plants. The longer side of his fence measures 44 m, while the shorter is 26 m. The posts in the garden fence were placed 2 m apart. How many posts would Mr. Reyes use to put up the perimeter fence?

Are you done answering?
If yes, time to check. Please go to page 16 for the ***Answer Key***.

What I Have Learned

How do we solve routine and non-routine word problems involving perimeter?

To solve **routine problems** involving perimeter of plane figures, we have to follow the four-step plan:

UNDERSTAND
- Know what is asked.
- Know the given facts.

PLAN
- Draw or illustrate to visualize the problem. (optional)
- Determine the operation or formula to use.

SOLVE
- Solve using the formula.

CHECK AND LOOK BACK
- Write the correct answer.

Non-routine problems can be solved by drawing a picture, using a number line, making a table, and others.

What I Can Do

Solve the following problems.

1. Karen has a square cartolina whose sides measure 60 cm each. She cuts the cartolina into two equal rectangles. Find the perimeter of one piece of rectangle.

2. A rectangle has a length of 30 cm and a width smaller by 5 cm. What is its perimeter?

Are you done answering?
If yes, time to check. Please go to page 16 for the ***Answer Key***.

Assessment

Solve each problem by following the correct step.

1. Anna loves chocolates. She ate a rectangular chocolate with a length of 11 cm and a width of 7 cm. What is the perimeter of the chocolate?

2. Johnny plays around a rectangular table. The table is 3 m by 5 m. He runs his toy car around the table five times. What is the distance covered by the toy car?

3. The three sides of a triangle measure 20 cm, 32 cm and 50 cm. What is the perimeter of the triangle?

4. Twelve light posts are placed around a square park. There are 4 light posts along each side of the park. If the distance between the light posts are 10 meters, what is the distance around the park?

5. Tina's garden is shaped like a trapezoid whose sides are 5 meters, 7 meters, 10 meters and 15 meters respectively. What is the measurement of the fence which surrounds the garden?

6. The perimeter of an isosceles triangle is 55 cm. One of the equal sides is 17 cm. How long is the base?

7. A square is cut into 4 identical rectangles. Find the perimeter of each rectangle if the perimeter of the square is 48 cm.

8. Neo and Mike has an equilateral triangular colored paper each whose measures of each side are 15 cm. They want to make a square kite and combine the 2 colored papers. What is the perimeter of the kite?

9. Nine identical small squares were put together to form a bigger square. The perimeter of each small square is 20 cm. Find the perimeter of the big square.

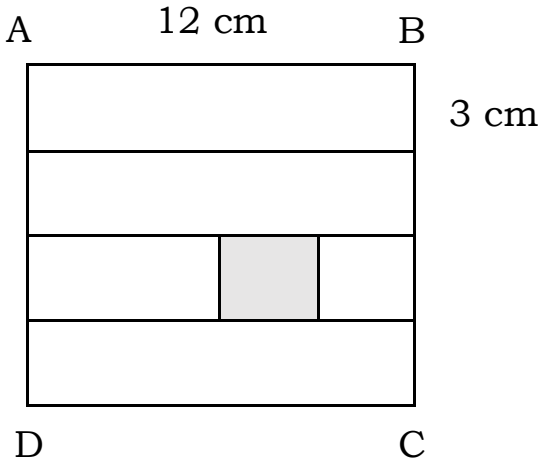
10. Joey bought a square lot. The measurement of the side is 80 m. He divided it into two equal parts. The resulting 2 lots are rectangular. He gave one lot to his brother. What is the perimeter of the remaining lot?

Are you done answering?
If yes, time to check. Please go to page 16 for the ***Answer Key***.

Additional Activities

Read and answer the problem below. Please write your four-step solution and illustration on your answer sheet.

Square ABCD is formed by 4 identical rectangles. The length and width of each rectangle are 12 cm and 3 cm, respectively. Inside of the figure is a rectangle, find the side of the small rectangle and its perimeter.



Are you done answering?
If yes, time to check. Please go to page 16 for the ***Answer Key***.

Answer Key

What I Know

1. C
2. B
3. D
4. C
5. A
6. 30 plants
7. 16 cm
8. 90 m
9. 160 cm
10. 72 m

What's In

1. 40 cm
2. 18 m
3. 31 cm
4. 24 m
5. 22 cm

What's More

1. 115 cm
2. 820 m
3. 70 posts

What I Can Do

1. 180 cm
2. 110 cm

Assessment

1. 36 cm
2. 80 m
3. 102 cm
4. 120 m
5. 37 m
6. 21 cm
7. 30 cm
8. 60 cm
9. 60 cm
10. 240 m

Additional Activities

1. Side of the small rectangle: w =3 cm

1 = 4 cm

2. Perimeter of the small rectangle = 14 cm

References

Tabilang, Alma R. et. Al. *Mathematics 4 Teacher's Guide.* Department of Education. 2015. pp. 248-251.

Tabilang, Alma R. et. Al. *Mathematics 4 Learner's Material.* Department of Education. 2015. pp. 188-191,

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