K-G3 Basic

G4-G7 Advanced

Helping With Math

GRADES

Problem Solving:
Measurement, Perimeter, and Area

Suitable for students
aged 4-12

The first Monday of October every year is World Habitat Day!

This pack is suitable for learners aged 4 to 12 years old or kindergarten to 7th graders. The content covers fact files and relevant basic and advanced activities of measurement, perimeter, and area topics that aim to develop and strengthen the learners' problem-solving skills.

Problem Solving As a Mathematics Skill

Problem-solving skills refer to the ability to identify a problem, determine its origin, and figure out all possible solutions to solve the problem. These are also a set of skills where you could formulate a variety of unique ways to solve a problem.

IMPORTANCE OF PROBLEM-SOLVING SKILLS

Mathematics aids us to understand the world and to provides an effective way of building mental discipline. Math encourages logical reasoning, critical thinking, creative thinking, abstract or spatial thinking, problem-solving ability, and even effective communication skills.

Problem solving...

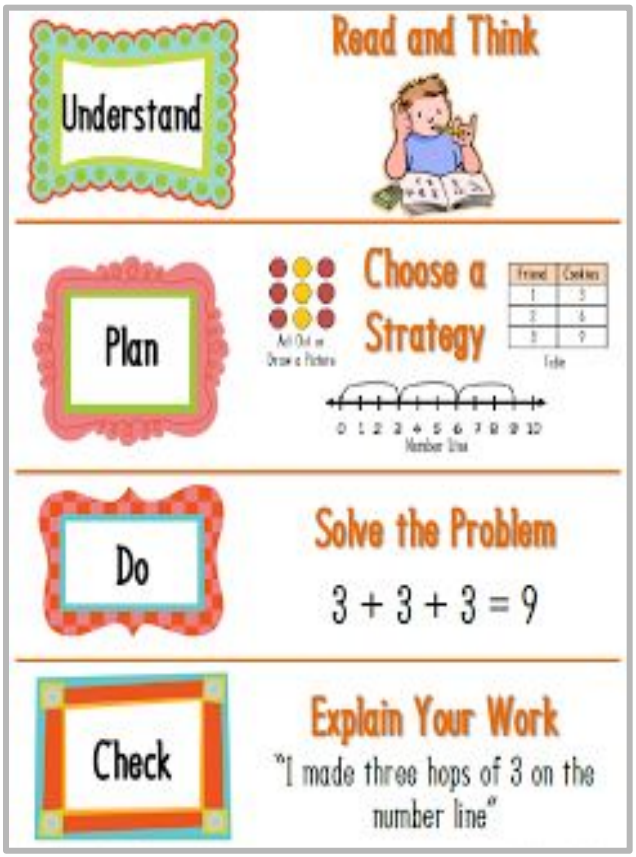
- plays a significant factor in mathematics and should have a critical role in the mathematics education of K-12 students.
- enhances a generic ability to solve real life problems and apply mathematics in real life situations.
- makes students to believe in their ability to think mathematically. They will appreciate that learning math means finding the solution to a problem.

Where can we apply problem-solving skills?

- in managing your finances
- in shopping for the best price of goods
- in preparing/cooking food
- in figuring out distance, length, or weight
- in generating more than one solution/alternative
- in making the best decision/option
- in predicting possible outcomes

PROBLEM-SOLVING STRATEGY

George Polya's Problem Solving Technique



Step 1:

- ❏ Do you understand all the words in the problem?
- ❏ What are you asked to find or show?
- ❏ Can you state the problem in your own words?
- ❏ Are the details enough for you to find the answer?

Step 2:

- ❏ Is it possible to use guess and check technique?
- ❏ Can you eliminate possibilities?
- ❏ Which plan will work? Which plan will not work?
- ❏ Will I use addition or subtraction?

Step 3:

- ❏ What is the equation?
- ❏ What will be the next step?
- ❏ Can you prove your solution?

Step 4:

- ❏ Can you check if your answer is correct?
- ❏ Does everything turn out well?
- ❏ What are the steps that worked and didn't work?

SAMPLE/APPLICATION

Basic Examples:

1. Gail Andrews is one of the leaders of advocating sustainable shelter for everyone. Her house is located in a rectangular lot that is 34-meter long and 32-meter wide. What is the perimeter and area of the lot?

Let's answer this problem using Polya's Problem Solving Techniques

Step 1: *Understand: What are you asked to find?*

Answer: You are asked to determine the perimeter and area of Gail Andrews' lot.

Step 2: *Plan: What shape is the given? What formula should I use to solve for the perimeter and area?*

Answer: The shape of the lot is rectangle. The formula of getting the perimeter and area of a rectangle are P = 2L + 2W and A = L x W, respectively.

Step 3: *Do: Solve for the perimeter and area.*

Answer:

For the perimeter: Length = 34 m and Width = 32 m

P = 2L + 2W = 2(34) + 2(32) = 68 + 64

P = 132 meters.

SAMPLE/APPLICATION

Cont. *Do: Solve for the perimeter and area.*

Answer:

For the area: Length = 34 m and Width = 32 m
A = L x W = (34 m) x (32 m)
A = 1088 square meters.

Step 4: *Check: Can you check if your answer is correct?*

Answer:

The perimeter of the lot is 132 meter while the area is 1088 square meters.

Advanced Example:

2. If Gail would like to convert the dimensions of the house from meters to feet, what would be the new measurements now?

Step 1: *Understand: What are you asked to find?*

Answer: The converted measurements of the lot from meters to feet.

Step 2: *Plan: What conversion value will I use?*

Answer:

The conversion is 1 meter ≈ 3.28 ft.

SAMPLE/APPLICATION

Step 3: *Do: Convert meters to feet.*

Answer:

Given: Length = 34 m and Width = 32 m
L = 34 x 3.28 ft = 111.53 ft
W = 32 x 3.28 ft = 104.96 ft

Step 4:

The new dimensions of the lot are l = 111.53 ft and w = 104.96 ft.

INDIVIDUAL PRACTICE

1. Gail Andrews is one of the leaders of advocating sustainable shelter for everyone. Her house is located in a rectangular lot that is 45-meter long and 40-meter wide. What is the perimeter and area of the lot?

2. If Gail would like to convert the dimensions of the house from meters to feet, what would be the new measurements now?

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COMPARING SHELTERS

K-G3
Basic

Help Annie figure out the answer to the following problems. Her task is to make a comparison sentence based on the following dimensions of a house.

Example:
Given: The length of House A is 8 meters. The length of House B is 5 meters.
Comparison statement: House A has a longer measurement than House B.

1. House A has a height of 25 ft while House B is 20-ft tall.

Answer:

2. House A has a floor width of 35 ft while House B has 38 ft.

Answer:

3. House A has four bedrooms while House B has three.

Answer:

4. House A has one kitchen area and House B has one kitchen too.

Answer:

5. House A has a floor area of 85 sq. m while House B has 100 sq.m.

Answer:

SOME METAL RODS

K-G3
Basic

Annie would like to determine the length of the delivered metal rods. These metal rods will be used to build houses for their charity project. Help her out!

1. The shortest metal rod measures 5 ft while the longest measures 10 ft. What is the difference of the two rods' length?

2. There are three rods whose measurements are the following: Rod A is 8 ft, Rod B is 5 ft, and Rod C is 9 ft. Arrange the rods in decreasing order of length.

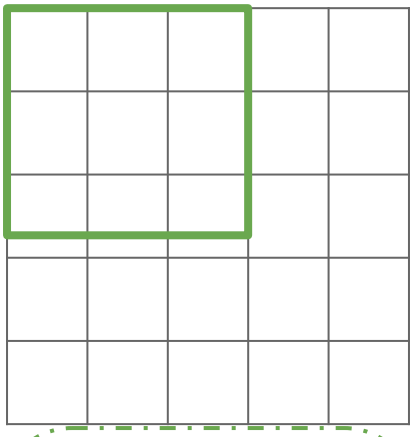
3. Draw four metal rods with the following length: 5 cm, 6 cm, 7 cm, and 8 cm. Remember to label them.

HABITAT LOT

K-G3
Basic

Look at the drawing below. Annie found these set of images and is now wondering what do they mean? Can you help her identify the dimensions of each lot?

1.



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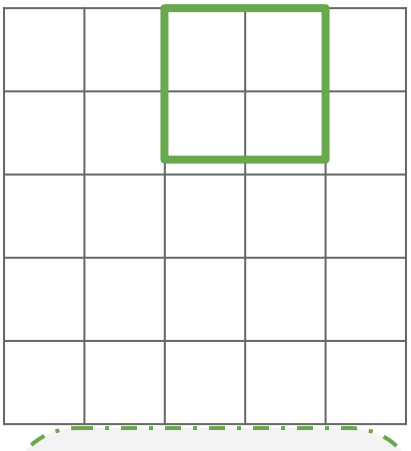

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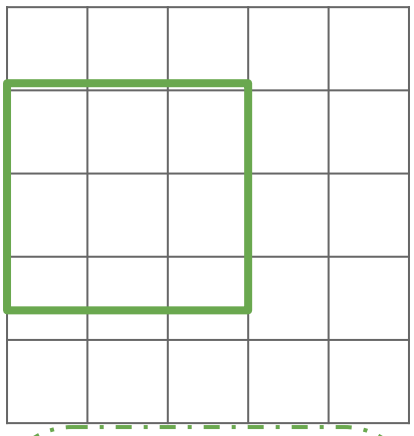

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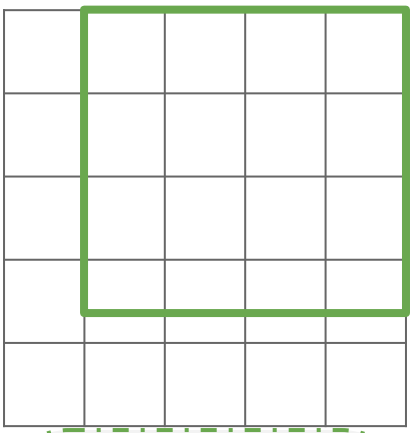

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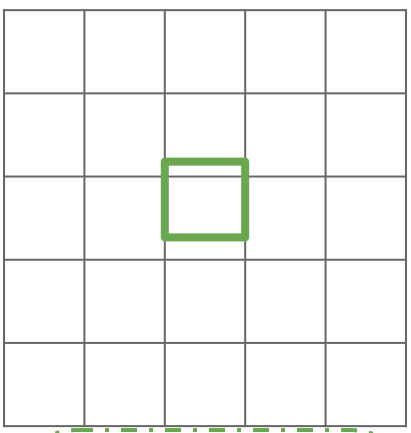

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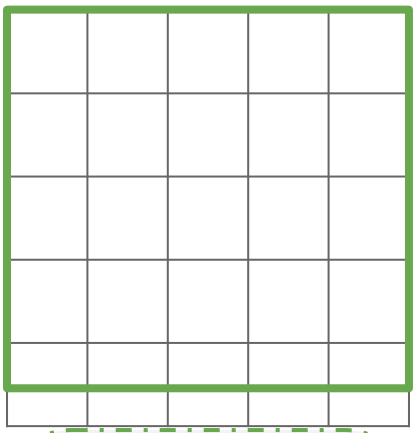
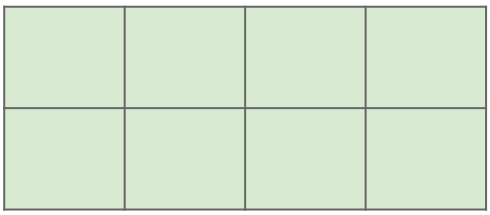
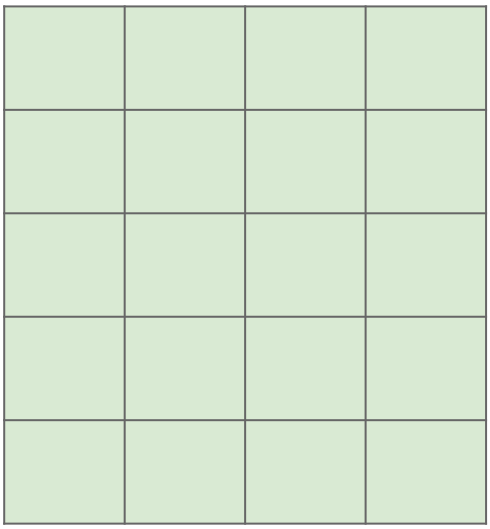


LEO'S DREAM FOR THE WORLD

K-G3
Basic

Leo's dream for the world is to become a place for everyone with their own homes. Leo is trying to create some dimensions of different floor areas. Can you help him identify each area?

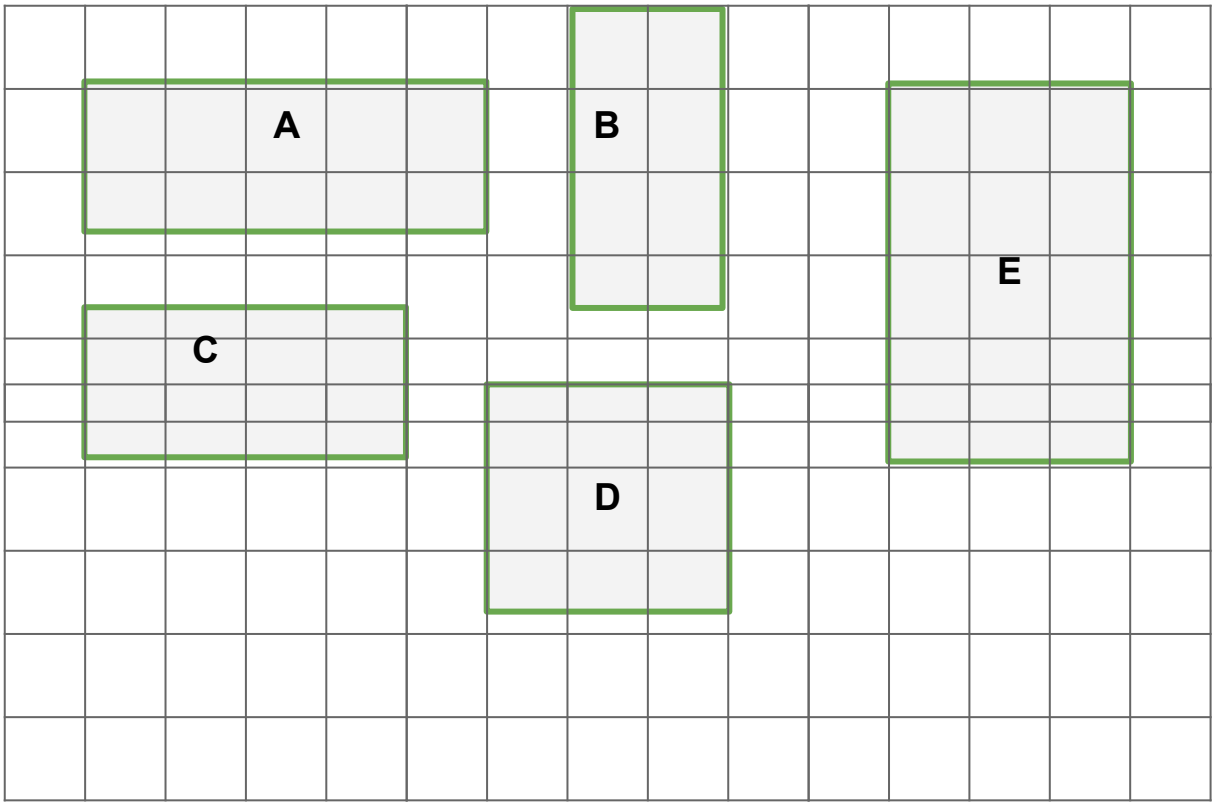




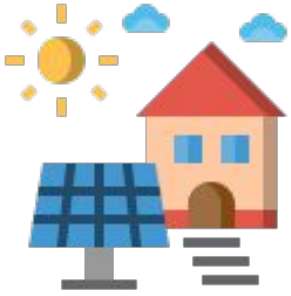
MAKING SPACES

K-G3
Basic

The figure below shows some identified areas for house building. Analyze them and answer the questions.



1. Which figure has an area of 15 sq. cm? _____
2. What is the area of figure C? _____
3. Which figure is a square? _____
4. What is the length of figure A? _____
5. What is the width of figure E? _____
6. Which two figures have the same area? _____
7. What is the total area of figures C and D? _____
8. Which figure has the smallest area? _____



TRIANGULAR BOARDS FOR ROOF

G5-G7 Advanced

Help the workers of the new Home-for-All Site compute for the perimeter of the following triangular boards. Also, draw and label each triangle based on its dimensions.

1. The board has the following lengths: 7 m, 5 m, and 9 m. Calculate its perimeter.	
2. A triangular board has a side whose length is 15 in. The other two sides are equal in length which is 10 in. What is its perimeter?	
3. The shortest side of a triangular board is 2 cm, the second side is twice as the length of the shortest side, and the third length is ½ cm longer than the second side. Solve for the perimeter.	

HOME-FOR-ALL ADVOCACY

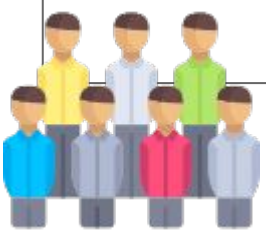
G5-G7 Advanced

Help Leo look for some vacant lots to build houses for the homeless and underprivileged. Given the following dimensions, solve for the perimeter.

1. A rectangular lot is 18 m in length and 12 m in width. Calculate its perimeter.

2. A rectangular lot has a length of 25 ft and a width of 15 ft. What is the perimeter?

3. A lot is 200 feet long. If the area of it is 20, 200 square feet, how many feet wide is the lot? What is its perimeter?



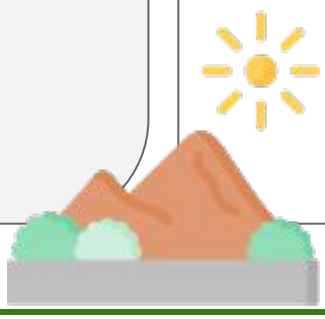
THE PURCHASED LOT

G5-G7
Advanced

Mel and Alex purchased several lots. The details of the lots are given below. Solve for what is being asked.

1. Mel bought two pieces of land. The dimensions of the two pieces of land are 50 feet x 40 feet and 85 feet x 60 feet. Calculate the total area of both pieces of land.

2. Alex has an idle lot that is 85 x 50 feet, and he also purchased a 20 feet x 10 feet pick of land. Find the total area of the lot.

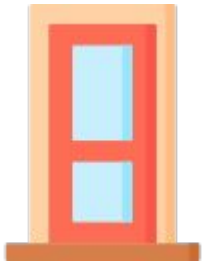


FURNITURE OF THE NEW HOUSE

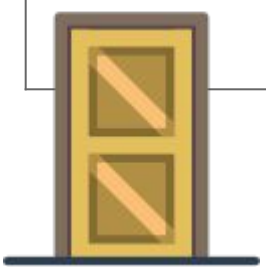
G5-G7 Advanced

Henry is working for the new house. This house will be donated to the UN as part of its advocacy in providing shelter to everyone. Refer to the situations below and solve.

1. The contractor wants to order a rectangular shaped table at Henry's. With curiosity, he asked this: What is the height of a rectangle with a perimeter of 122.8 in and base length of 50.2 in?



2. A wooden door measures 70.23 inches in length and 1.75 yards in width. Calculate for the area that is needed to paint by the two carpenters.



RECTANGLE AND TRIANGLE

G5-G7 Advanced

Read and understand the following situations. These involve rectangle and triangle that can be used in building a house. Solve.

1. Henry told Annie that the current door they are working on for the UN House Project has an area of more than 4895 square inches. The door is a 8 ft by 5.5 ft wood. Is his claim correct? Why or why not?

2. A triangular tile whose base is 1.2 m and height which is 80 cm. Compute for the area of the given triangle.

ANSWER GUIDE

Activity 1

1. House A is taller than House B.
2. House B is wider than House A.
3. House A has more bedrooms than House B.
4. Both houses have one kitchen area.
5. House B has a larger floor area than House A.

Activity 2

1. 5 ft
2. Rod C, rod A, Rod B
3. Drawings may vary. But make sure that the images vary in length.

Activity 3

1. 9 sq. cm
2. 4 sq. cm
3. 9 sq. cm
4. 16 sq. cm
5. 1 sq. cm
6. 25 sq. cm

Activity 4

1. 8 sq. units
2. 12 sq. units
3. 20 sq. units
4. 4 sq. units

Activity 5

1. Figure E
2. 8 sq. units
3. Figure D
4. 5 units
5. 3 units
6. Figures B and C
7. 17 sq. units
8. Figure B or Figure C

Activity 6

1. P = 7 + 5 + 9 = 21 m
2. P = 15 + 10 + 10 = 35 in
3. P = 2 + 4 + 4.5 = 10.5 cm

ANSWER GUIDE

Activity 7

1. P = 2L = 2W = 2(18) + 2(12) = 36 + 24 = 60 m
2. P = 2L = 2W = 2(25) + 2(15) = 50 + 30 = 80 ft
3. W = 101 ft, the perimeter is: P = 2L = 2W = 2(200) + 2(101) = 400 + 202 = 602 ft

Activity 8

1. Land A = L x W = 50 ft x 40 ft = 2000 sq. ft.
   Land B = L x W = 85 ft x 60 ft = 5100 sq. ft.
   Total area = Area of Land A + Area of Land B
   Total area = 2000 sq ft + 5100 sq ft = 7100 sq ft.
2. Land A = L x W = 85 ft x 50 ft = 4250 sq. ft.
   Land B = L x W = 20 ft x 10 ft = 200 sq. ft.
   Total area = Area of Land A + Area of Land B
   Total area = 4250 sq ft + 200 sq ft = 4450 sq ft.

Activity 9

1. 11.2 inches
2. A = L x W = 70.23 x 63 = 4424.49 sq. in

Activity 10

1. Yes,, because the area of the door is only 6336 sq. in
2. A =½ bh = ½ (120 cm)(80 cm) = 4800 sq. cm

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