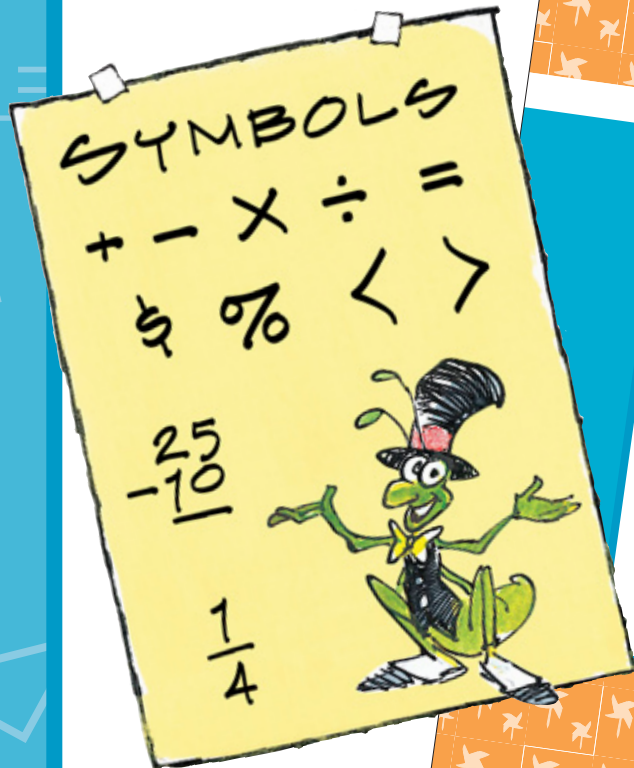


THE SCIENCE OF
Global
Atmospheric
Change

THE MATH LINK

for *The Science of Global Atmospheric Change Teacher's Guide* and *Mr. Slaptail's Curious Contraption*

Written by
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The Math Links have been created as ready-to-use mathematics activities that are directly related to My World[®] integrated units. They are not intended to represent a comprehensive mathematics program. The activities are related to mathematics objectives common to many curricula and cover a range of grade and ability levels. Teachers may wish to select from these activities those that are most appropriate for their own students.

BioEdSM

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The activities described in this book are intended for school-age children under direct supervision of adults. The authors, Baylor College of Medicine and the publisher cannot be responsible for any accidents or injuries that may result from conduct of the activities, from not specifically following directions, or from ignoring cautions contained in the text.

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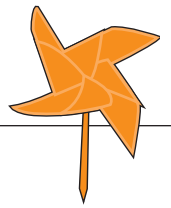
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Problem Solving with Measurements



Read each problem below and fill in the circle beside the best answer.

1. Mr. Slaptail likes to bathe in a full tub of water. About how much water would Mr. Slaptail need to take a bath?

25 gallons 25 quarts 25 pints



2. About how much lemonade would it take to give Mr. Slaptail, Riff and Rosie each an 8-ounce glass of lemonade?

25 ounces 12 ounces 125 ounces

3. Wally Rabbit and his neighbors used shovels to remove rocks from Beulah Diggerpaw's mine. About how many pounds of rocks do you think a full shovel can hold?

1 pound 10 pounds 100 pounds



4. Rosie and Mr. Slaptail followed a piece of Riff's string as they tried to find Riff and Ms. Diggerpaw in the mine. About how long do you think the string might have been?

1 yard 10 yards 50 yards

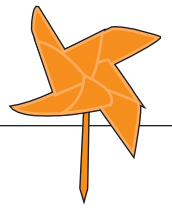
5. The contraption on Mr. Slaptail's roof sends hot water directly to his bathtub. About how warm, in degrees **Fahrenheit** ($^{\circ}\text{F}$), do you think the water in Mr. Slaptail's new water heater gets?

10°F 100°F 1000°F

6. About how cool do you think Riff's refreshing glass of lemonade would be?

25°F 40°F 80°F





Mr. Slaptail's water wheel makes 10 complete turns in 1 minute. Fill in the blanks below to make each number sentence correct.



1. How many turns would the water wheel make in:

- a. 5 minutes? _____ turns
- b. 10 minutes? _____ turns
- c. 15 minutes? _____ turns

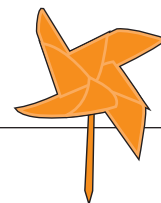
2. Do you see a relationship between the three numbers above in items a–c? Record your answer below.

3. How many turns would the water wheel make in:

- a. 1 hour? _____ turns
- b. 1 day? _____ turns
- c. 1 week? _____ turns



Problem Solving with Patterns (cont.)



The temperature in Mr. Slaptail's solar water heater increases by 2°F every 15 minutes between 7:00 a.m. and 5:00 p.m. At 5:00 p.m., the temperature starts to decrease. Use this information to make each number sentence correct and answer each question below.

1. If the temperature in the tub is 60°F at 8:00 a.m., what would the temperature be at the following times?

a. 8:15 a.m. = _____ $^{\circ}\text{F}$

b. 8:30 a.m. = _____ $^{\circ}\text{F}$

c. 8:45 a.m. = _____ $^{\circ}\text{F}$



2. Do you see a relationship between the three numbers above in items a–c? Record your answer below.

3. If the temperature in the tub is 60°F at 8:00 a.m., what would the temperature be at the following times?

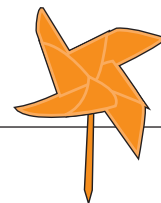
a. 10:00 a.m. = _____ $^{\circ}\text{F}$

b. Noon = _____ $^{\circ}\text{F}$

4. How many degrees does the temperature increase every hour between 7:00 a.m. and 5:00 p.m.? _____

5. Why do you think the temperature in the tub starts to decrease after 5:00 p.m.?





To answer each question below, you may want to work on a separate sheet of paper.



1. Mr. Slaptail prepared lemonade for his friends. Rosie had one glass of lemonade. Mr. Slaptail drank $1\frac{1}{2}$ glasses of lemonade and Riff drank two and three-fourths glasses. How many glasses of lemonade did they drink in all?

2. It takes two lemons to make one large glass of lemonade. How many lemons did Mr. Slaptail use to make all the lemonade?

3. Riff had a fourth drink and Rosie had a second one, but neither could finish the lemonade. If Riff left $\frac{1}{4}$ of his fourth glass and Rosie left $\frac{1}{2}$ of her second glass, how much lemonade did they leave all together?

4. If Mr. Slaptail left $\frac{3}{4}$ of his glass of lemonade and Riff left $\frac{1}{4}$ of his glass, how much more lemonade did Mr. Slaptail leave?

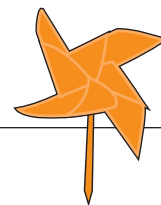
5. Fill in the blanks below to make each number sentence correct.

a. $\frac{1}{2}$ glass + $\frac{1}{2}$ glass = _____ glass

b. $\frac{1}{4}$ glass + $\frac{1}{4}$ glass = _____ glass

c. $\frac{1}{8}$ glass + $1\frac{3}{8}$ glasses = _____ glasses





**“Remember to practice basic facts.
Practice does make perfect!”**



1. Fill in the blanks with a number that will make each problem correct.

a. $8 + 2 = \underline{10}$ $8 + 5 = \underline{\quad}$ $8 + 7 = \underline{\quad}$

b. $8 + 3 = \underline{\quad}$ $8 + 1 = \underline{\quad}$ $8 + 6 = \underline{\quad}$

c. $8 + 4 = \underline{\quad}$ $8 + 9 = \underline{\quad}$ $8 + 0 = \underline{\quad}$

d. $8 + 8 = \underline{\quad}$ $0 + 8 = \underline{\quad}$ $5 + 8 = \underline{\quad}$

e. $10 + 8 = \underline{\quad}$ $7 + 8 = \underline{\quad}$ $6 + 8 = \underline{\quad}$

f. $2 + 8 = \underline{\quad}$ $1 + 8 = \underline{\quad}$ $3 + 8 = \underline{\quad}$

g. $9 + 8 = \underline{\quad}$ $4 + 8 = \underline{\quad}$ $8 + 10 = \underline{\quad}$

2. Solve each problem below.

a.

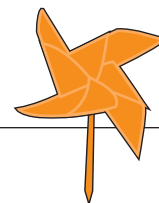
$\begin{array}{r} 20 \\ +14 \\ \hline 34 \end{array}$	$\begin{array}{r} 22 \\ +14 \\ \hline \end{array}$	$\begin{array}{r} 24 \\ +14 \\ \hline \end{array}$	$\begin{array}{r} 21 \\ +14 \\ \hline \end{array}$	$\begin{array}{r} 23 \\ +14 \\ \hline \end{array}$	$\begin{array}{r} 25 \\ +14 \\ \hline \end{array}$	$\begin{array}{r} 26 \\ +14 \\ \hline \end{array}$
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b.

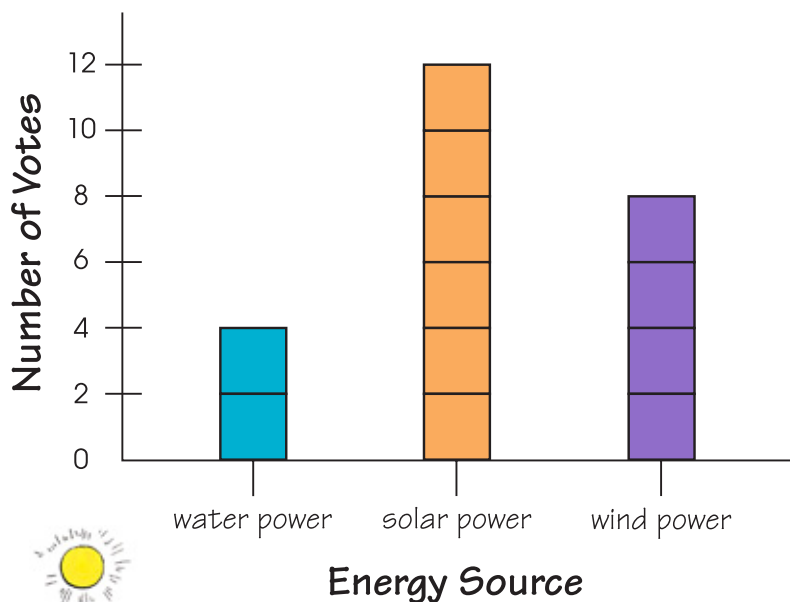
$\begin{array}{r} 10 \\ +12 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ +14 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ +16 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ +18 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ +20 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ +22 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ +24 \\ \hline \end{array}$
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Reading a Graph

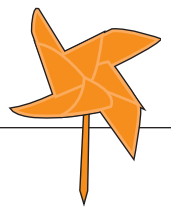


The citizens of Bright Water Corners voted on which alternative energy sources they should start using. This graph shows the results of their vote. Use the information from the graph to answer the questions below.



1. Most citizens are in favor of what kind of power? _____
2. How many citizens in all voted for solar power *and* water power? _____
3. How many citizens voted? _____
4. How many more citizens voted for wind power than for water power? _____
5. What kind of power was chosen by the fewest number of citizens? _____





1. Plot the following coordinates on the Bright Water Corners Mapping Graph on page 8. Draw a picture or symbol to represent each coordinate. The first one is done for you.

a. Rosie lives at (4, 4). Draw her house at this point on the graph.

b. Rosie's aunt lives at (0, 1). Mark the spot on the graph with a circle. Fill in the circle.

c. Mr. Slaptail has many books in his library. His house is at (2, 3). Draw a book at this point on the graph.

d. The Bright Water Corners grocery store is at (1, 6). Draw a piece of fruit or a vegetable at this point on the graph.

e. Beulah Diggerpaw's coal mine is at (5, 6). Draw a shovel there.



2. Each side of a square on the grid equals $\frac{1}{2}$ mile. Use the graph on page 8 to find how far it is from Rosie's house to each location given below. Follow the gridlines when measuring distance.

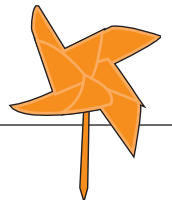
a. Rosie's aunt's house _____

b. Mr. Slaptail's house _____

c. The Bright Water Corners grocery store _____

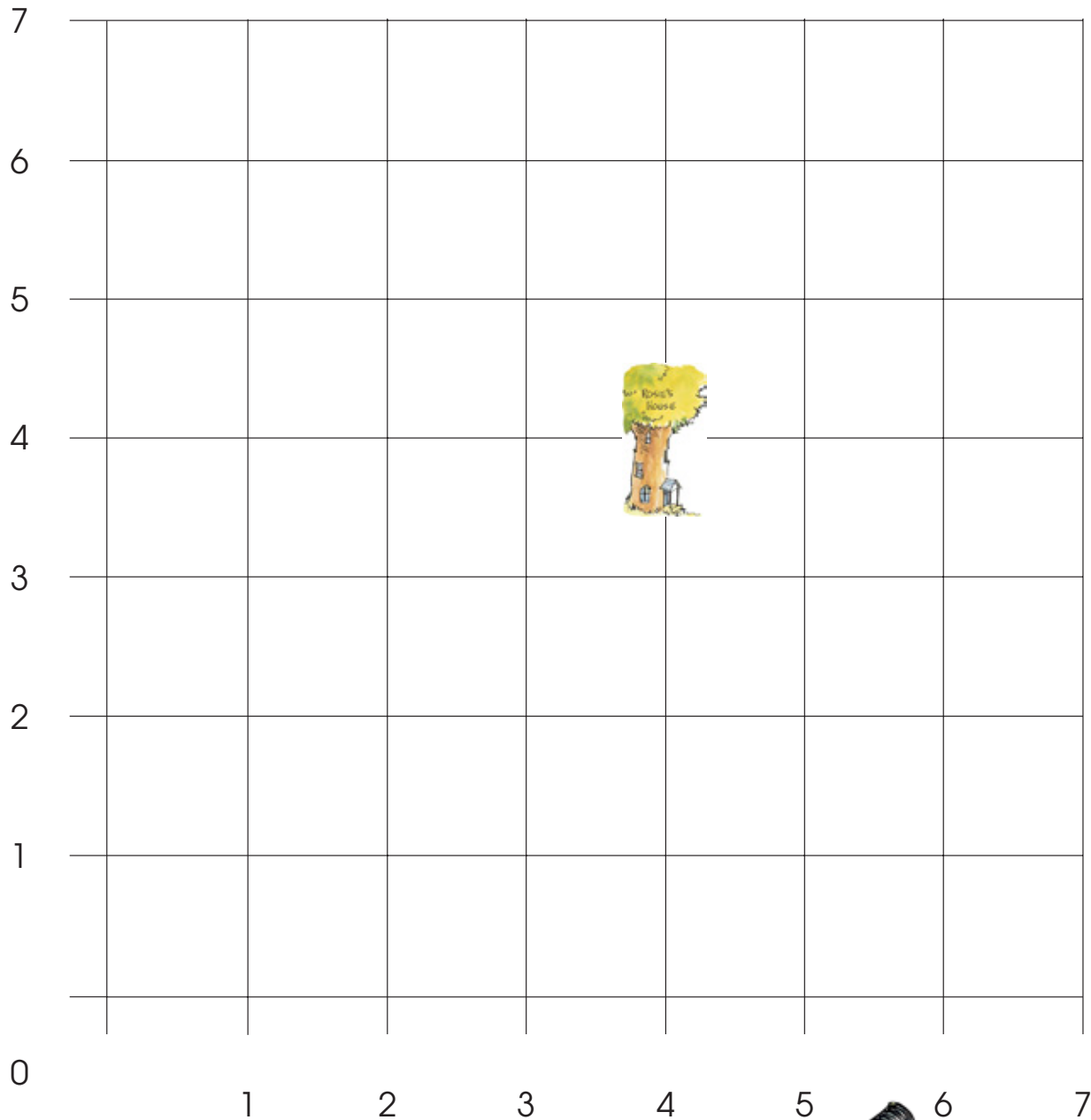
d. Beulah Diggerpaw's coal mine _____



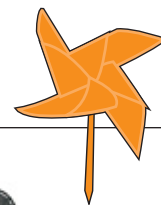


BRIGHT WATER CORNERS

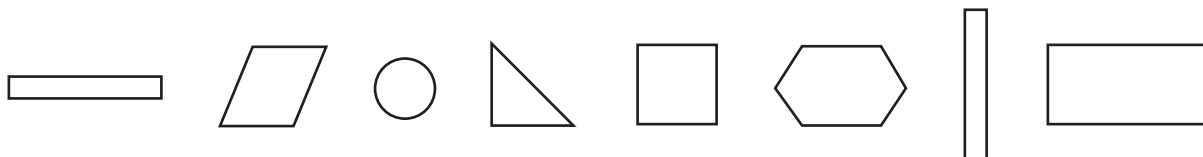
Mapping Graph



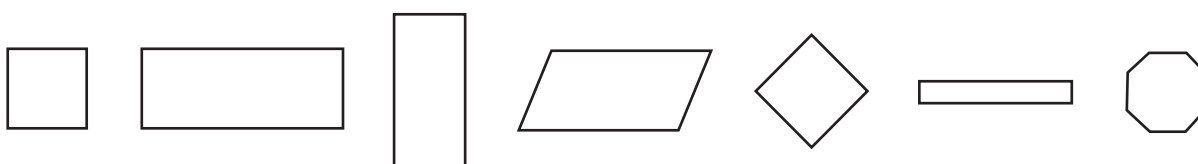
Shapes



1. Circle all the figures with at least one “square corner.”
Square corners also are called “right angles.”



2. Circle the shapes that are rectangles.



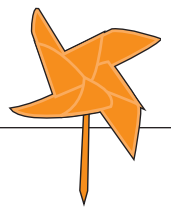
3. Write the name of something that is shaped like a triangle. _____
4. In the space below, draw 3 different shapes that have 4 straight sides and 4 square corners.

5. Where would you find these shapes in the real world?
- _____

6. Draw a circle around all the triangles. Draw a box around all the quadrilaterals.



Area and Perimeter



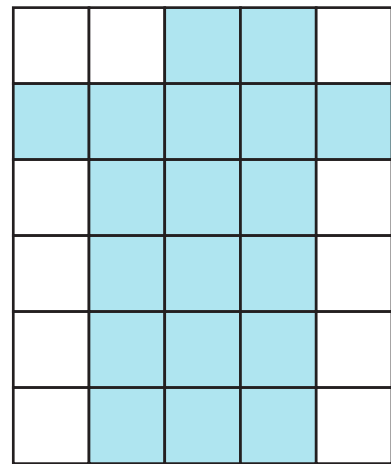
A grid can be used to represent a floor plan.
Each square in the grid represents a larger area.



Area is the number of square units within a shape. **Perimeter** is the distance around the edges of a shape.

Each 1 cm square = 1 meter

Floor Plan of Rosie's Room

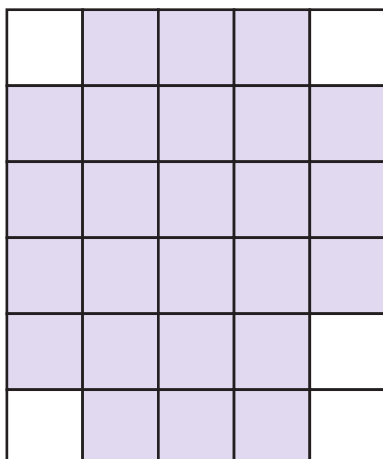


1. Rosie and Riff often play in Rosie's room. The grid on the right is a floor plan of the room.
 - a. What is the area of the shaded part?

- b. What is the perimeter of the shaded part?

2. Below is the floor plan of the room where Riff stays when he comes to visit Rosie. While he visits, they call it "Riff's Room."

Floor Plan of Riff's Room

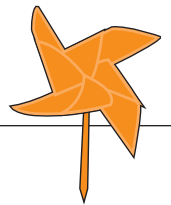


- a. What is the area of the shaded part?

- b. What is the perimeter of the shaded part?



Area and Perimeter (cont.)

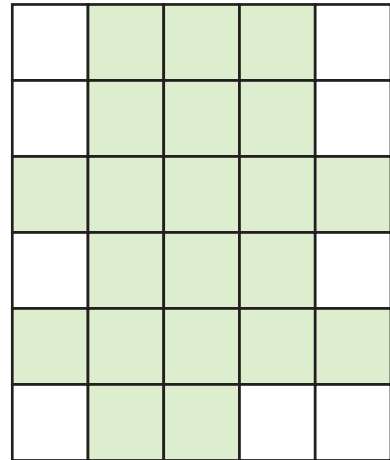


3. Mr. Slaptail has lots of rooms in his house. This is the floor plan of one of them.

a. What is the area of the shaded part?

b. What is the perimeter of the shaded part?

Floor Plan of Mr. Slaptail's Room



4. Look at all three floor plans. Whose room has the largest area?

5. Is there a relationship between area and perimeter? Explain.

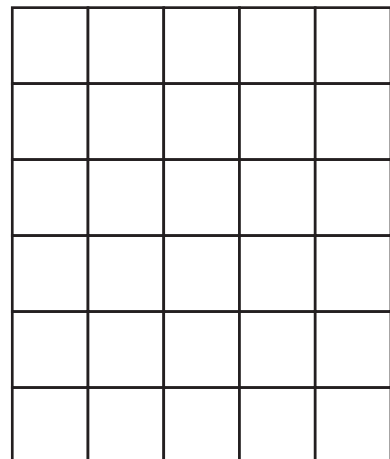
Bonus:

6. Using the blank grid on the right, color in the squares to make a floor plan of your own room.

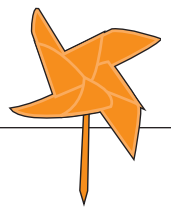
a. What is the area of your room?

b. What is the perimeter of your room?

Floor Plan of Your Room



Comparing Area and Perimeter

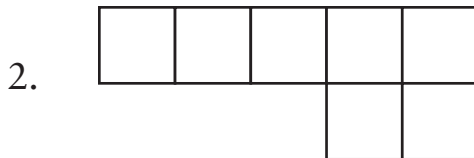


The areas of the figures below are between 5 and 10 square units. The perimeters of the figures are between 10 and 18 units. Calculate the area and perimeter of each figure. The first one is done for you. Complete the blanks for each shape.



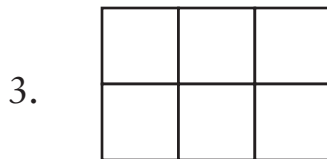
area = 5 square units

perimeter = 12 units



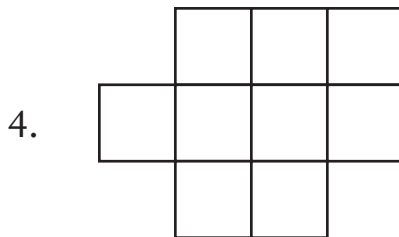
area = _____ square units

perimeter = _____ units



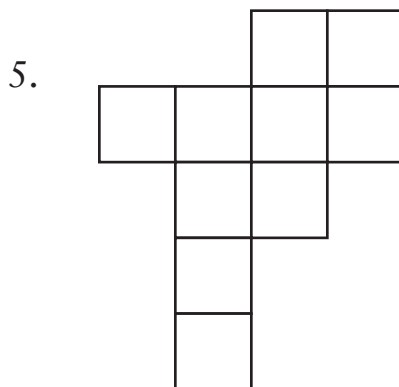
area = _____ square units

perimeter = _____ units



area = _____ square units

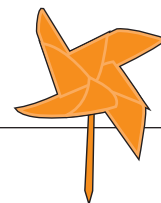
perimeter = _____ units



area = _____ square units

perimeter = _____ units

Comparing Area and Perimeter (cont.)



6. What do you notice about the area and perimeter of **congruent** figures?

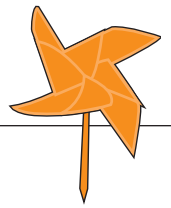


Congruent figures have the same shapes, but are different sizes.

Bonus:

7. There are 12 different figures that can be made using 5 squares. How many can you make?





1. It takes both of Rosie's feet, heel-to-toe, to measure 1 foot. List five other things that are about 1 foot long.

- a. _____ d. _____
b. _____ e. _____
c. _____

2. Riff has decided to measure a few of his friends. He finds out that his friends are different heights. Use the information below to help you answer the questions that follow.



Wally
36 inches



Rosie
27 inches



Mr. Slaptail
48 inches



Ricardo
30 inches



Delores
45 inches



Beulah
32 inches

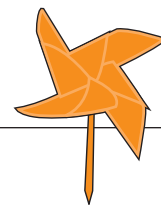


Sully
26 inches

a. Make a list and put Riff's friends in order by height, from tallest to shortest.

1. _____ 5. _____
2. _____ 6. _____
3. _____ 7. _____
4. _____

Measuring (cont.)



b. Look at your list of Riff's friends' heights. Use the information on the list to complete each number sentence below.

1. height range = _____ inches

2. median height = _____ inches

3. mean height = _____ inches

4. mode height = _____ inches

Bonus:

3. Collect data on the heights of students in your class. Make a graph or chart of the results. Explore the range, mean, median and mode.

