

## 5E Lesson Plan Perimeter and Area

**teachHOUSTON Student Name:**

**Mentor Teacher Name:**

**Grade Level:** 4th

**Lesson Teaching Date:**

**Concept(s):** Perimeter is the distance around the outside of a shape. Area is the space inside a 2-D figure. Area and perimeter are two examples of measurement used in real life.

**TEKS:**

4.11 Measurement. The student applies measurement concepts. The student is expected to estimate and measure to solve problems involving length (including perimeter) and area. The student uses measurement tools to measure capacity/volume and weight/mass. The student is expected to:

(A) estimate and use measurement tools to determine length (including perimeter), area, capacity and weight/mass using standard units SI (metric) and customary;

4.15 Underlying processes and mathematical tools. The student communicates about Grade 4 mathematics using informal language. The student is expected to:

(A) explain and record observations using objects, words, pictures, numbers, and technology;

(B) relate informal language to mathematical language and symbols.

Objectives	Evaluation Questions For Each Objective
1. Differentiate between the area and perimeter of an object	
2. Calculate perimeter and area of an object by using formulas	
3. Use perimeter and area formulas to solve real-life problems.	

## Materials List and Advanced Preparations:

For each student:

- 1 Activity sheet “Calculating the Size of my Garden”

For each group:

Colored tiles

For the teacher:

- “How Big Is My Garden?” transparency
- “Elaboration Directions” transparency

<b>ENGAGEMENT</b>		
<b>What the Teacher Will Do</b>	<b>Eliciting Questions/ Student Responses</b>	<b>What the Students Will Do</b>
<p>Display a transparency of “How Big Is My Garden?”</p> <p>The teacher will facilitate a class discussion about different ways to describe the size of a figure. As students give answers, make connections to formal vocabulary such as: dimensions, length, width, perimeter, and area if students do not use those words themselves.</p>	<p>What are some different ways to describe the size of my garden?</p> <p><i>-Measure the length &amp; width</i> <i>-Find the distance all the way around the outside</i> <i>-Find the amount of space inside the garden</i></p> <p>What type of measurement would I need if I wanted to build a fence around my garden? <i>Perimeter</i></p> <p>What type of measurement would I need if I wanted to find out how much grass is inside my garden? <i>Area</i></p> <p>In your own words, what is area? <i>The space inside a 2-D shape</i></p> <p>In your own words, what is perimeter? <i>The distance around the outside of a shape</i></p> <p>What is another real life</p>	<p>Students brainstorm different ways to describe the size of the garden.</p>

	<p>example when we would need to find area?</p> <ul style="list-style-type: none"> <li>-To figure out how much carpet you need when building a house</li> <li>-To figure out how much paint you need to paint a wall</li> <li>-To figure out how much concrete is needed to pave a parking lot</li> </ul> <p>What is another real life example when we would need to find perimeter?</p> <ul style="list-style-type: none"> <li>-To build a walkway around a swimming pool</li> <li>-To find the distance of the sidewalk around a city block</li> <li>-To find the length of fabric needed to sew trim around the edge of a blanket or quilt</li> </ul>	
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<b>TRANSITION</b>
We've just learned the difference between area and perimeter. In this next activity, we will explore how to calculate the area and perimeter of different shapes.

<b>EXPLORATION</b>		
<b>What the Teacher Will Do</b>	<b>Eliciting Questions/ Student Responses</b>	<b>What the Students Will Do</b>
<p>Pass out activity sheet "Calculating the Size of My Garden"</p> <p>The teacher will facilitate a class discussion surrounding strategies for calculating area and perimeter.</p>	<p>How can you find the perimeter of any shape? <i>Add up all the sides</i></p> <p>How can you find the area of any shape? <i>Count the number of squares that cover the shape.</i></p>	<p>In groups, students discuss and complete questions 1-4.</p> <p>Students will share their solutions with the class.</p> <p>In groups, students discuss and complete questions 5-8.</p>

<b>TRANSITION</b>
You have talked about several different kinds of area problems in your groups. Now you will have an opportunity to share your solutions with the class.

## EXPLANATION

What the Teacher Will Do	Eliciting Questions/ Student Responses	What the Students Will Do
	<p>How did you find the area of non-rectangular shapes? <i>Counted the squares inside the shape</i></p> <p>How did you account for the partial squares? <i>Counted almost full squares as 1, combined half squares together to make 1, did not count square that were almost empty</i></p> <p>Could you find the perimeter of the flag shape? <i>No, because some of the lines are curves</i></p> <p>Could you find the perimeter of the hexagon? <i>You could find the perimeter if you knew the length of each of the sides of the hexagon</i></p> <p>Compare and contrast two ways of calculating area of a rectangle. <i>You can count all the squares or you can multiply the length times the width. Using the formula is faster. Counting squares may be easier if the multiplication is difficult, but it will take longer.</i></p>	<p>Selected students will share the solution methods for questions 5-8.</p>

## TRANSITION

We have learned how to find the area and perimeter of several shapes. Do you think area or perimeter is bigger? Is that always true? Could two shapes have the same area, but different perimeters? In this next activity, you will explore the answers to these questions.

## ELABORATION

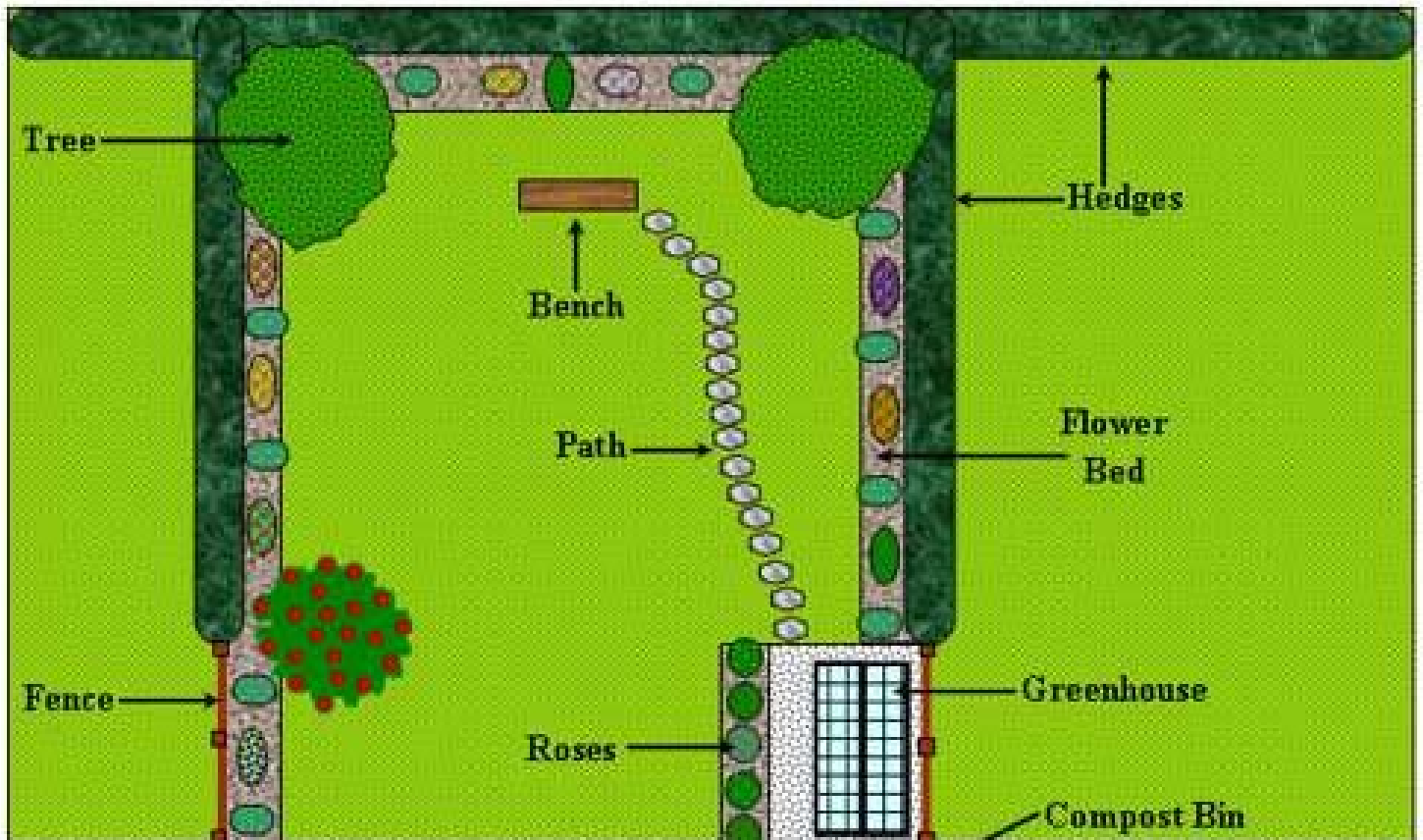
What the Teacher Will Do	Eliciting Questions/ Student Responses	What the Students Will Do
<p>Pass out colored square tiles to each group.</p> <p>Display Elaboration Directions on the overhead.</p>	<p>Can two shapes have the same perimeter but different areas? <i>Yes</i></p> <p>Can two shapes have the same area but different perimeters? <i>Yes</i></p> <p>Is there a direct relationship between the area and perimeter of a shape? <i>No</i></p> <p>What kinds of shapes can be created with an area of 8 square units? <i>-Any rectangle that has dimensions that are factors of 8.</i> <i>-Other shapes can also be made as long as they only use 8 square tiles.</i></p> <p>What kinds of shapes can be created with a perimeter of 20 units? <i>-Many different rectangles, some are long and skinny, others are shorter and wider, including a perfect square.</i></p>	<p>Students will use the colored square tiles to complete the following tasks:</p> <ol style="list-style-type: none"> <li>1. Create a shape that has a perimeter of 16 units.</li> <li>2. Can you create a different shape that also has a perimeter of 16 units? How many shapes with perimeter 16 units can you make?</li> <li>3. Create a shape that has an area of 12 square units.</li> <li>4. How many different shapes can you make with an area of 12 square units?</li> <li>5. Create a shape with an area of 8 square units and the largest possible perimeter.</li> <li>6. Create a shape with an perimeter of 20 units and the largest possible area.</li> </ol>

### TRANSITION

Now you will have an opportunity to show what you have learned about area and perimeter.

## EVALUATION

# How Big Is My Garden?



What are some different ways to describe the size of my garden?

What if I want to build a fence around my garden?

What if I want to know how much grass is in my garden?

## Calculating the Size of My Garden

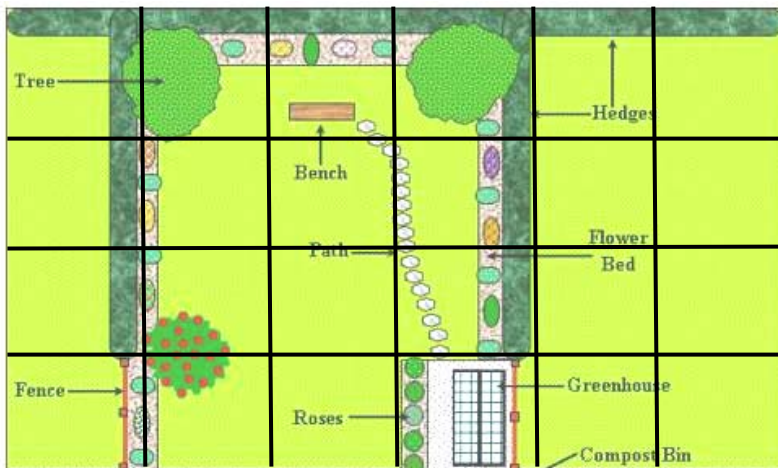
1. What is the perimeter of the garden?



4 yards

6 yards

2. What is the area of the garden?



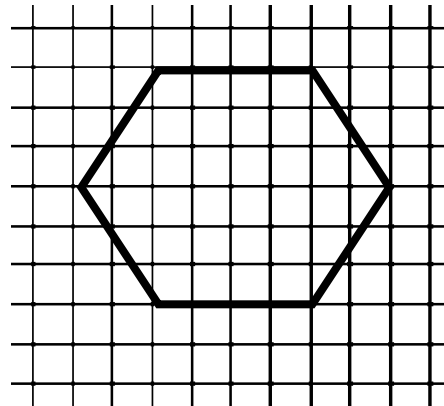
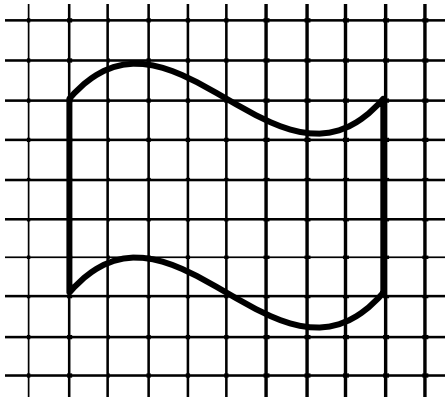
4 yards

6 yards

3. How can you find the perimeter of any shape?

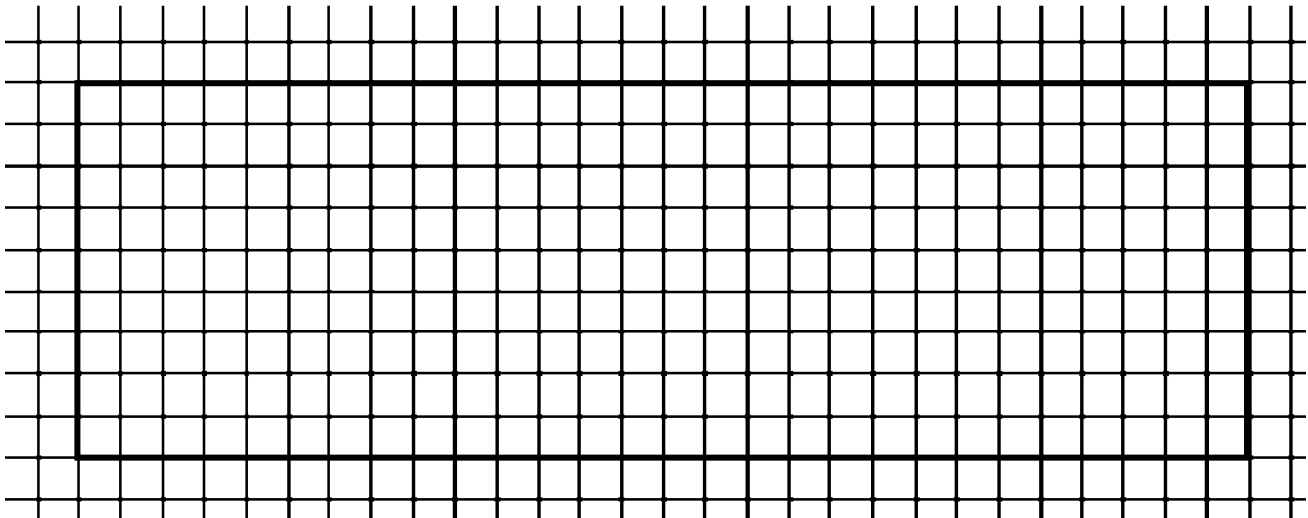
4. How can you find the area of any shape?

5. Estimate the area of each of the following shapes.



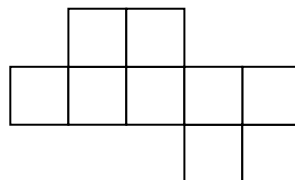
6. Can you find the perimeter of the shapes above? Why or why not?

7. Tell two ways to find the area of the rectangle below. Which method do you like better? Why? Use your preferred method to calculate the area of the rectangle. Also find the perimeter.



8. Area = \_\_\_\_\_

Perimeter = \_\_\_\_\_



Each square is 1 unit long and 1 unit wide.

## Elaboration Tasks

### **Use your colored tiles to...**

1. Create a shape that has a perimeter of 16 units.
2. Can you create a different shape that also has a perimeter of 16 units? How many shapes with perimeter 16 units can you make?
3. Create a shape that has an area of 12 square units.
4. How many different shapes can you make with an area of 12 square units?
5. Create a shape with an area of 8 square units and the largest possible perimeter.
6. Create a shape with a perimeter of 20 units and the largest possible area.