



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Student Exploration: Fido's Flower Bed

**Vocabulary:** area, perimeter, square yard, yard

**Prior Knowledge Questions** (Do these BEFORE using the Gizmo.)

- To the right is a garden. Each square of grass is one square yard. How many square yards are in the garden? (This is called the **area** of the garden.)



\_\_\_\_\_

- This garden has been fenced in. Each fence segment is one yard long. What is the total fence length? (This length is the **perimeter** of the garden.)



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### Gizmo Warm-up

In the *Fido's Flower Bed* Gizmo, the Mini-Garden Company designs and builds gardens. You are an apprentice garden designer. Gardens are made of green squares of sod (grass and soil).

There is one very important design rule in the Mini-Garden Company. Sod pieces must connect along at least one full edge, not just a corner. (See the images to the right.)



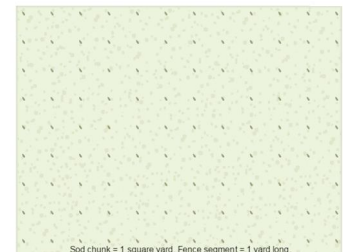
OK



Not OK

The final step for a garden is to fence it in around its perimeter.

- In the Gizmo, build a small, simple garden using sod from your **Sod supply**. Then fence it in using the **Fence supply**. Sketch your garden on the planning grid on the right.



A. What is the area of your first garden? \_\_\_\_\_

B. What is its perimeter? \_\_\_\_\_


- Now build a larger, more creative garden. Sketch it and record its area and its perimeter.



A. What is the area of your second garden? \_\_\_\_\_

B. What is its perimeter? \_\_\_\_\_



<b>Activity A:</b> <b>Building mini-gardens</b>	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"> <li>Click on the <b>Clear sod</b> and <b>Clear fence</b> buttons.</li> </ul>	
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The Mini-Garden Company wants you to design gardens for their new Mini-Garden Catalog.

- The smallest garden is one-sod square (area = 1 square yard). First predict what the perimeter of this garden is. (Envision fencing it in, and don't forget to use correct units.) Then build the garden in the Gizmo and fence it in to find the actual perimeter.

Perimeter of 1-sq.-yard garden: Prediction \_\_\_\_\_ Actual \_\_\_\_\_

- The next smallest garden is 2 sod squares (area = 2 square yards). Predict its perimeter. Then build it in the Gizmo and fence it in to find its actual perimeter.

Perimeter of 2-sq.-yard garden: Prediction \_\_\_\_\_ Actual \_\_\_\_\_

- The next largest is 3 sod squares. Try to make different shaped gardens using just three sod squares. Record the perimeters of your first two gardens. Don't forget to use correct units.

Perimeter of first 3-square-yard garden: \_\_\_\_\_

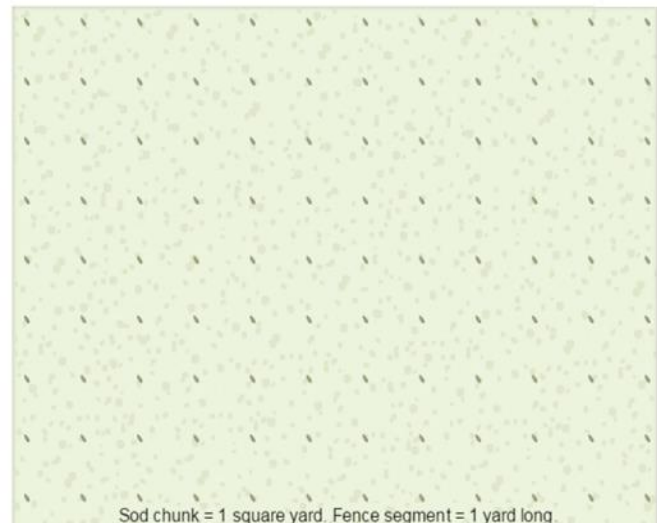
Perimeter of second 3-square-yard garden: \_\_\_\_\_

- Create gardens with an area of 4 sod squares (4 square yds.). Make as many different-shaped gardens as you can.

Remember, sod squares must touch at a full side, not just at a corner.


Sketch your gardens on the grid. Label each one with its area and perimeter.

Label the garden(s) with the longest perimeters with an L, and the shortest perimeters with an S.



- Challenge: What are all possible perimeters for a garden with an area of 6 square yards?

\_\_\_\_\_

<b>Activity B:</b> <b>Area vs. perimeter</b>	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"> <li>Click on the <b>Clear sod</b> and <b>Clear fence</b> buttons.</li> </ul>	
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The Mini-Garden Company gives its apprentices a garden design challenge.

- Build three different 8-piece sod gardens (area = 8 square yards) that all have different perimeters. Record them on the grids below. Write the area and perimeter of each garden. Don't forget to include the units for your areas and perimeters.




- A customer wants an 8-square-yard garden. He wonders how many yards of fence he will need to fence it in. What is the least he could use? What is the most he might need?

Least fencing: \_\_\_\_\_ Most fencing: \_\_\_\_\_

- Challenge: One garden designer said that all gardens with an area of 36 square yards have the same perimeter.

- Based on your experience, do you think the claim is true? \_\_\_\_\_
- Explain why or why not. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- Examine the 36-square-yard **Prebuilt lawns** in the Gizmo to check your answer. (Use **Auto fence!**) Do all 36-square-yard lawns have the same perimeter? Explain.  
 \_\_\_\_\_  
 \_\_\_\_\_

- Challenge: Investigate the perimeters of the **Prebuilt lawns**. If you want a 36-square-yard garden, but you want to use very little fencing, what shape should you use? Explain.  
 \_\_\_\_\_  
 \_\_\_\_\_

<b>Activity C:</b> <b>Quicker calculations</b>	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"> <li>Click on the <b>Clear sod</b> and <b>Clear fence</b> buttons.</li> </ul>	
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The most popular Mini-gardens are rectangular. Customers often order rectangular gardens like this: “I want a garden that is 7 yards wide and 3 yards deep.” Your job is to figure out how much fence will be needed for a rectangular garden, just by knowing the garden’s dimensions.

1. First build the 7-yard-by-3-yard garden in the Gizmo and figure out its perimeter.

The perimeter of the 7-by-3 garden is: \_\_\_\_\_

2. Now build the rectangular gardens listed in the customer order table below, figure out their perimeters, and record your answers in the perimeter column. Use correct units!

Rectangular Garden Orders		
Width	Depth	Perimeter
3 yards	2 yards	
4 yards	3 yards	
2 yards	6 yards	

3. The builders would like to know the perimeter of a garden before they build it. Try to help them figure out how to do that for the garden orders below.

- First fill in the Predicted Perimeters column in the table below.
- Then build the gardens in the Gizmo and fill in the Actual Perimeters.

Rectangular Garden Orders			
Width	Depth	Predicted Perimeter	Actual Perimeter
2 yards	5 yards		
3 yards	8 yards		
5 yards	3 yards		

4. Describe any strategies you used to find the perimeters. (Challenge: If you can, state your method as a formula that the builders can use!)

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