

Area and Perimeter Menu

(all activities adapted from *About Teaching Mathematics*
by Marilyn Burns except Square the Circle)

Appetizers (choose 1)

- Foot Stuff
- Perimeter with Cuiseniare Rods

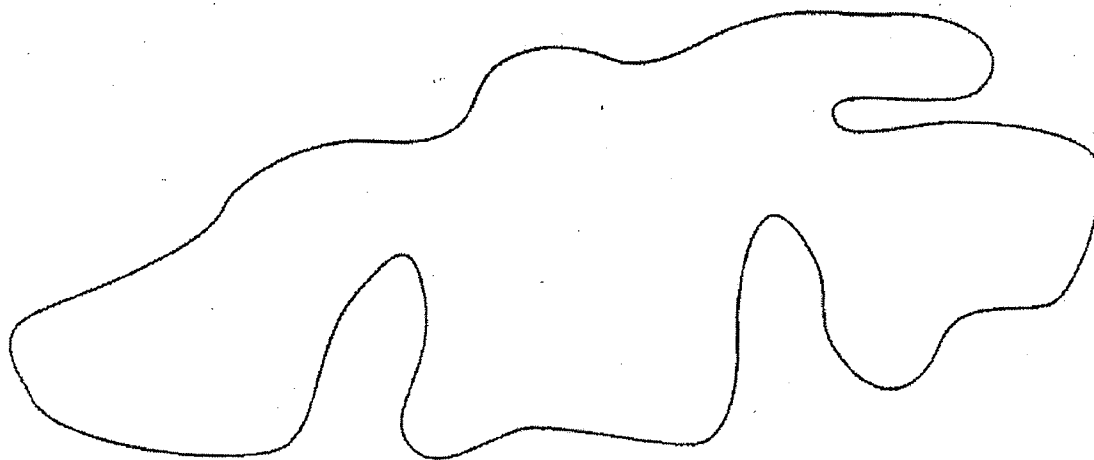
Entrees (do both)

- Area Stays the Same
- Perimeter Stays the Same

Dessert (choose 1)

- Square the Circle
- Banquet Table

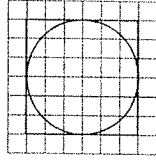
The Blob



You want to find the area of this blob. Your friend has a suggestion: "Lay a piece of string around the perimeter. Arrange the string to form a square and then figure out the area. The area of the square will be just about the same as the area of the blob."

Do you agree or disagree with your friend's method? Or are you unsure? Explain your thinking. Use a sketch if it helps to explain your ideas.

Square the Circle



Materials:

- 1 jar lid
- centimeter grid paper

Directions:

Part I: Finding Two Areas: the area of the circle and the area of the square that surrounds it

- trace your circle on a piece of graph paper
- count the squares (and partial squares) to find the area
- draw the square that surrounds your circle, with the sides of the square tangent to the circle
- figure out (as best you can) the area of the square

Part II: What is the ratio of the area of the circle to the area of the square?

$$\frac{\text{Area of the Circle}}{\text{Area of the Square}}$$

Part III: Using Formula

Area of a Circle: πr^2

Area of a Square: S^2

Compare your ratios.....

The Perimeter Stays the Same

Materials:

centimeter grid paper

Directions:

Draw three different shapes on centimeter grid paper following three rules. Record the area inside each shape.

1. Stay on the lines when you draw.
2. You must be able to cut your shape out and have it stay all in one piece.
3. Each shape must have a perimeter of 30 centimeters.

Record the area on each shape. Compare your shapes with the shapes of the others in your group. Cut out the one that has the greatest area and the one with the least. Tape them on the class chart.

The Banquet Table Problem

Materials:

24 color tiles
centimeter grid paper

Directions:

A banquet hall has a huge collection of small square tables that fit together to make larger, rectangular tables. Arrange tiles to find the different number of people that can be seated if twelve small tables are used. Do the same if twenty-four are used. Record on squared paper.

Extensions:

1. *The 100-Table Problem.* If one hundred small square tables are arranged into a large rectangular table, find the most and least numbers of people that can be seated.
2. *Banquet Cost.* If the banquet hall charges by the number of square tables used, what's the least expensive way to seat 16 people? 50 people? 60? 100? Any number?

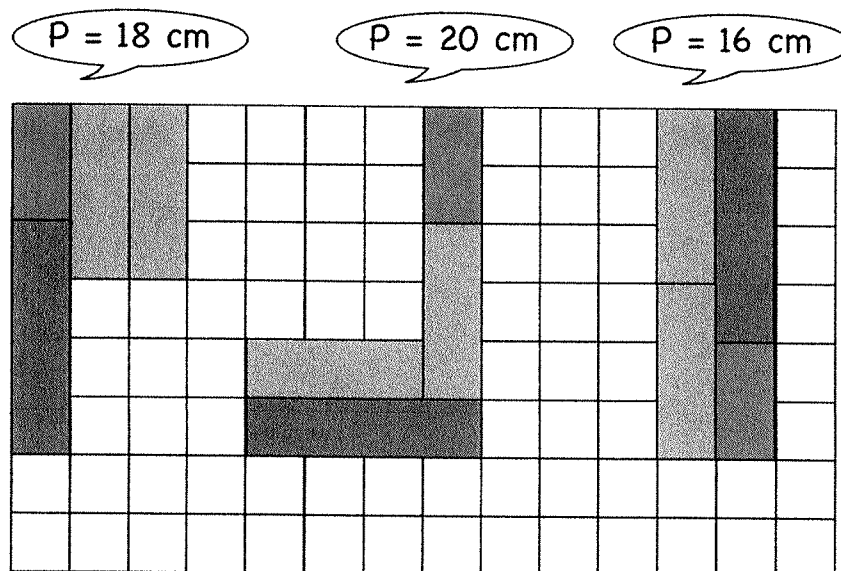
Perimeter with Cuisenaire Rods

Materials:

Cuisenaire rods - 1 red, 2 light green, and 1 purple
centimeter grid paper

Directions:

Use one red rod, two light green rods, and one purple rod. Arrange the rods into a shape on centimeter grid paper in such a way that when you trace around it, you draw only on the lines of the grid paper. Also, you must be able to cut out the outlined shape and have it remain in one piece. (Corners touching are not allowed.) Make several different shapes in this way. Trace each and record its perimeter. Experiment to find how to arrange the rods to get the longest perimeter and the shortest perimeter.



The Area Stays the Same

Materials:

5-by-8-inch index cards, one per group
centimeter grid paper
newsprint

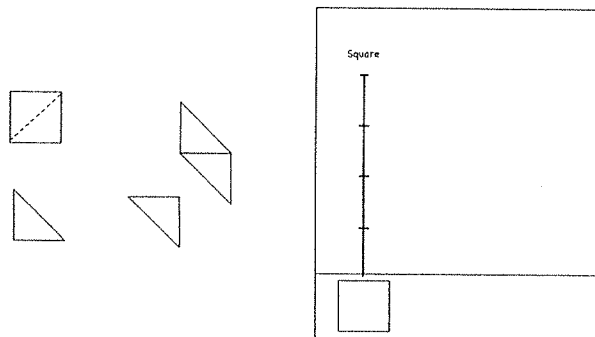
Directions:

Cut a square that measures 5 centimeters on each side from the index card. Use the centimeter grid paper to help you. Use this shape to make other different shapes. You can do this by cutting the square on the diagonal into two triangles and putting them together in various ways or by cutting the square in other ways and arranging the pieces together.

Trace around the different shapes you make, cutting each from the index card. You will need at least 5 shapes, including the original 5-centimeter square. All of your shapes will have the same area.

On the newsprint, draw a line segment equal in length to the perimeter of each shape. (You can use the actual shapes and trace around each edge.) Label each line segment with the shape.

How do the perimeters compare? Record and make a statement about your findings.



Foot Stuff

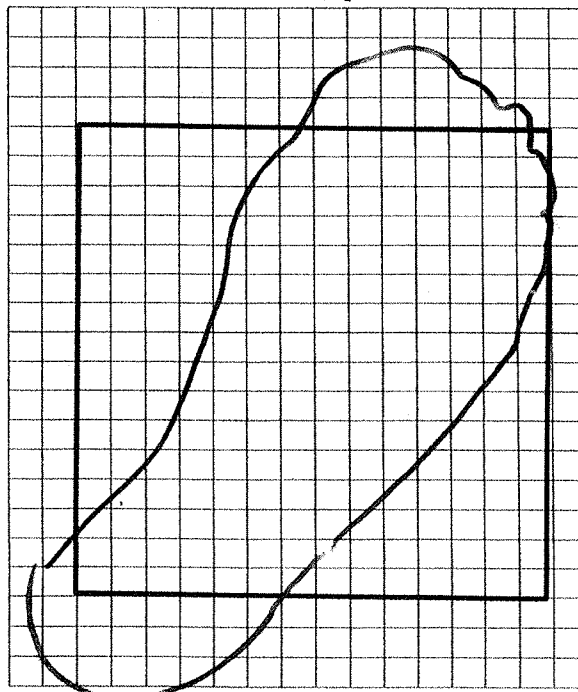
Materials:

your foot
centimeter grid paper
string

Directions:

- Trace around your foot on centimeter grid paper.
- Figure the area of your foot in square centimeters and record.
- Cut a piece of string equal to the perimeter of your foot.
- Use the string to make a square on the centimeter grid paper and find the area of the square.
- How do the two areas compare?

Area of foot = _____ square cm
Area of square = _____ square cm
1-Centimeter Squares



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1-Centimeter Squares

