Exploring Perimeter

Grade Levels

These activities are intended for grade 3.

Common Core Standard(s)

3.MD.D.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Objectives and Topics

- Students count the number of units of length around the edge of regular and irregular polygons to determine their perimeters.
- Students use rulers to measure side lengths that are not provided.
- Students explore the connection between the perimeter and area of rectangles.

Materials and Resources

- For *Music Video:*
  - Internet connection
  - projector and speakers
- For *Straw Polygons:*
  - straws cut into lengths of 2, 4, and 6 inches
  - pipe cleaners cut into 2-inch pieces
- For *Perimeter is Everywhere:*
  - painters or masking tape
  - yardsticks
- For *Geoboards:*
  - geoboards
  - rubber bands
- For *Name Banners:*
  - grid paper
  - color pencils, crayons
- For *Connection between Area and Perimeter:*
  - square tiles
  - grid paper

Introduction and Outline

Teachers may choose to use any of the following activities. Activities marked with an * should be done after students have had exposure to **area**.

0.1 Vocabulary

Introduce the word **perimeter**, which comes from the Greek words *peri* meaning "around" and *metron* meaning "measure." Ask, What other words could be used instead of **perimeter**? Suggest terms such as border, edge, rim, or boundary.

0.2 Music Video*

Click on the link below to show a 3-minute music video emphasizing a conceptual difference between area and perimeter.
Math Rocks! Perimeter Area

0.3 Straw Polygons

Using straws cut into lengths of 2, 4, and 6 inches, along with pipe cleaners cut into 2-inch pieces, students explore perimeter by making regular and irregular polygons with sides of various lengths. They measure and record the lengths, then they draw the shapes in their notebooks noting the length of each side along with the total perimeter. Using premeasured lengths makes it easier to quickly check if students are adding up the sides correctly.

0.4 Perimeter is Everywhere

While the students are out of the room, use painters tape or masking tape to outline several large polygons. Working in small groups, students use yardsticks to record the length of each side, and then they add them together. After measuring the floor polygons, students move about the room measuring the perimeter of everyday items such as rugs, cabinet doors, their desks, etc. Students record their findings (diagrams, measurements, total perimeters) in their notebooks.

0.5 Geoboards

Students use rubber bands on geoboards to create shapes with different perimeters that have been written on the board. For example, ask them to make a square with a perimeter of 16 units, a rectangle with a perimeter of 12 units, etc.

0.6 Name Banners*

Students write out their names on square grid paper. Then they find the area and perimeter of each letter, and then find the area and perimeter of their entire name. Have students work in cooperative groups in case they have trouble visualizing how a letter can be made out of squares.

0.7 Connection between Area and Perimeter*

1. Write *24 sq. units* on the board and say, A rectangle has an area of 24 square units. What are some possible side lengths the rectangle can have? Have students work with square tiles to generate as many side lengths as they can, then have them draw each rectangle on grid paper recording the perimeter on the outside of each rectangle.

2. Invite volunteers to record their findings on a chart similar to the one below:

Area	Diagram	Perimeter
24 sq. units		
24 sq. units		
24 sq. units		

3. Write *24 units* on the board and say, A rectangle has a perimeter of 24 units. What are some possible side lengths the rectangle can have? Have students work with square tiles to generate as many side lengths as they can, then have them draw each rectangle on grid paper recording the area on the inside of each rectangle.

4. Invite volunteers to record their findings on the chart:

Area	Diagram	Perimeter
		24 units
		24 units
		24 units

5. Have students study the charts. Ask, When the area stays the same, what do you notice? How does the shape of the rectangle change? How does the perimeter change? Through discussion, bring out that when the area stays the same, the perimeter can change. As the rectangle becomes longer and narrower, the perimeter increases. As the rectangle becomes more square, the perimeter decreases.

6. Ask, When the perimeter stays the same, what do you notice? How does the shape of the rectangle change? How does the perimeter change? Through discussion, bring out that when the perimeter stays the same, the area can change. As the rectangle becomes longer and narrower, the area decreases. As the rectangle becomes more square, the area increases.

7. Repeat the Steps 1-6 with different areas and perimeters to reinforce the concept.