Algebra/Geometry Institute Summer 2005

Lesson Plan 2: Finding Perimeter and Area

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School: Carver Upper Elementary, Indianola School District
Grade Level: 5th
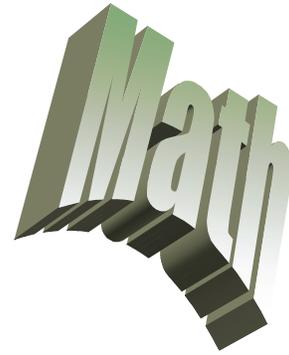
1   Teaching objective(s)
         The students will find the perimeter and area of rectangles.

2   Instructional Activities
         *Begin the lesson by reviewing polygons. Call on volunteers to define polygon.
         (A polygon is a flat, closed shape with straight sides).

         *Have students give examples of polygons. (Examples: Triangle, Square,
         Rectangle, Pentagon, Hexagon, Octagon, and Decagon.)

         *Inform students that the square and rectangle are the polygons that will be
         discussed today. Call on volunteers to compare and contrast a square and a
         rectangle. (Examples: A square and rectangle both have four sides, and they both
         form 4 right angles. All sides of a square are equal, but only the opposite sides of
         a rectangle are equal). Reviewing the characteristics of a square and a rectangle
         will enable the students to have a better understanding of the lesson. At the same
         time, the students will be able to successfully complete each activity for today's
         lesson.

         *Divide students into five groups. Give each group a spool of yarn, scissors,
         rulers, and a bucket of 1 inch cubes. Instruct each student to use the cubes to
         form a square region. (Model the activity using overhead colored tiles). Tell
         students the square regions they form may vary in size. After students have made
         a square out of the cubes, have students cut enough yarn from the spool to outline
         the square. (Remind students to be sure the yarn does not overlap).

         *After students have placed yarn around the square, instruct them to remove the
         yarn and measure the length of the yarn using a ruler. Remind students to
         measure the yarn in inches.   (Measurements may vary). Allow students to share
         their findings.

         *Tell students they have just found the perimeter of the square region they
         formed.

         *Say, "Today, we will find the perimeter and the area of rectangles."

*Tell students the perimeter is the distance around a figure or a polygon. It is the sum of the lengths of the sides.

*Have students count the cubes in the border of the square region. (Discuss what happens at the corners).

*Ask, "What is the perimeter of the region if each cube is 1 inch?" Call on volunteers from each group for a response.

*Tell students multiplication can also be used to find the perimeter. Call on volunteers to explain how this is done.

*Instruct students to count the number of cubes on one side. Then, multiply that number by 4, which represents the number of sides. Allow time for questions and clarification. Explain that the measurement of only one side of a square is needed because all sides are equal.

*After discussing perimeter, ask students to name some professions that require finding the perimeter.
(Examples: Carpenters, Landscapers, Interior Designers, Gardeners, etc.)

*Say, "Let's pretend a square measures 5cm on each side." "What is the perimeter?" Call on volunteers to share their findings. (The perimeter is 20 cm because 5 cm x 4 is 20 cm).

*Repeat the activity using a rectangular region. Show students how to find the perimeter of a rectangle using multiplication. (The perimeter of a rectangle is 2 x the width of a rectangle plus 2 x the length of a rectangle).

*Tell students the length of the rectangle is 6 cm long and the width is 4 cm wide. Have students find the perimeter. Students should add all sides. The perimeter is 20 cm. Have someone find the perimeter using multiplication.

*Have students use the same rectangular region for the next activity. Tell them to count the total number of cubes used to make the region.
 *Say, "You have just found the area of the region".

*Tell students the area is the number of square units that covers a surface. Inform students that area is measured in square units.

* Inform students that you can also multiply the length of a rectangle x width of a rectangle to find the area.

*Now have students multiply the length x width to find the area. Students should have the same answer. The total number of cubes counted should be the same as the number of horizontal cubes x the vertical cubes.

*Draw a rectangle on the overhead. Let the length equal 6 cm and the width equal 3 cm. Have students find the area using the same formula. The answer is 18 because 6x3=18.

*Draw several arrays on a transparency. Three square arrays and three rectangular arrays. A 3 by 4; 6 by 2; 2 by 5; 3 by 3: 4 by 4: and a 6 by 6. Have students find the area of each.

*As a quick review, ask students to find the perimeter of the same arrays. Randomly call on students.

*Inform students that the next activity will be completed by each group. Assign each group a problem. Each group should answer each question, but only explain and illustrate one of them. Tell them to keep in mind how to find the area and perimeter of rectangles.

*Provide students with a review of today's concept.

*Give each student a worksheet on finding the perimeter and area. (See Attachment).

*Allow students ample time to complete the worksheet.

*Remind students to show their work.

3   Materials and Resources
Chalkboard
Chalk
Transparency
Markers
Yarn
Scissors
Cubes
Textbook: Abbott, Janet: Mathematics Today; Copyright 1987.
Resource: Rhythms Productions. Let's Measure: Measure Activities. Copyright 1978 and 1991.
Resource: Hands-On, Inc. Hands-On Measurement Grades 3-8. Copyright 1988 and 1991.

4   Assessment
The teacher will walk around the room to monitor each student's progress.
He or she will be looking for the students having a grasp of the concept.
Worksheets will be taken up and graded on their work shown.

Answer each question using the information provided. Use grid paper to draw each figure.
Show your Work!

1. **The side of a square measures 4 cm. What is the perimeter and area of the square?**

2. **The length of a rectangle is 6 cm long. The width is 4 cm wide. What is the perimeter and area of the rectangle?**

3. **The area of a square is 36 cm square units. What is the perimeter of the square?**

4. **The perimeter of a rectangle is 24 centimeters. What is the area of the rectangle if the length measures 8 centimeters? What is the width?**

5. **The area of a rectangle is 28 square units. What is the perimeter of the rectangle? What is the length and the width of the rectangle?**