

## Dear Family,

The next unit in your child's mathematics class this year is **Covering and Surrounding: Two-Dimensional Measurement**. The focus is area (covering) and perimeter (surrounding). The unit helps students develop an understanding of perimeters and areas of rectangles, triangles, parallelograms, and circles. Students use estimating and counting to find areas and perimeters of irregular figures.

### UNIT GOALS

The overarching goal of this unit is to help students understand what it means to measure. Students study two kinds of measurements: perimeter and area. Since students often do not know how each of these measures affects the other, students study them together to probe the relationships.

Students develop strategies for measuring perimeter and area. Their strategies are discussed and used to formulate rules for finding area and perimeter of different figures. Many ideas from previous units will be revisited and extended in this unit. For example, from the *Prime Time* unit, the connection between factors and dimensions of rectangles will be used.

### HELPING WITH HOMEWORK

You can help with homework and encourage sound mathematical habits as your child studies this unit by asking questions such as:

- How do you know which measurements of a figure are involved—area or perimeter?
- How can you find the area and perimeter of an irregular shape?
- How can you find the area and perimeter of a regular shape?
- Is an exact answer required?
- Is there a relationship between area and perimeter that will help solve the problem?

In your child's notebook, you can find worked-out examples from problems done in class, notes on the mathematics of the unit, and descriptions of the vocabulary words.

### HAVING CONVERSATIONS ABOUT THE MATHEMATICS IN COVERING AND SURROUNDING

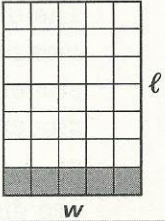

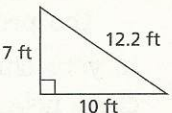
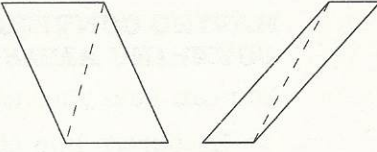
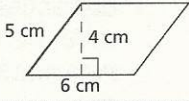
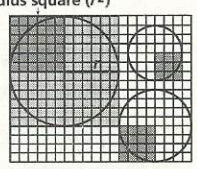
You can help your child with his or her work for this unit in several ways:

- Encourage him or her to use the measuring tools you have at home, such as measuring tapes and rulers, to practice making measurements.
- Help your child develop personal referents for estimating lengths and distances. For example, the distance from home to school might be one mile, or the span of your child's hand might be six inches. Use these referents to estimate other distances and lengths.
- Help your child develop personal referents for estimating area. Use the area of his or her bedroom to estimate areas of other rooms.
- Look over your child's homework and make sure all questions are answered and that explanations are clear.

A few important mathematical ideas that your child will learn in *Covering and Surrounding* are given on the back. As always, if you have any questions or concerns about this unit or your child's progress in class, please feel free to call.

Sincerely,



| Important Concepts  | Examples   |
|---|--|
| <p><b>The Measurement Process</b></p> <ul style="list-style-type: none"> <li>• Identify an object and the attribute to be measured.</li> <li>• Select an appropriate unit.</li> <li>• Repeatedly "match" the unit to the attribute of the object (or phenomenon, such as time).</li> <li>• Determine the number of units.</li> </ul>      | <p><b>Measuring Perimeter</b><br/>Measuring perimeter requires counting how many linear units are needed to surround an object.</p> <p><b>Measuring Area</b><br/>Measuring area requires counting how many square units are needed to cover an object.</p>   |
| <p><b>Area of Rectangles</b><br/>Students begin finding the area by counting the number of squares enclosed. To count more efficiently, they find the number of squares in one row and multiply by the number of rows. In other words, find the area by multiplying the length (how many in a row) by the width (the number of rows).</p> | <p>There are 5 squares in the first row and 7 rows in all. The area of the rectangle is <math>5 \times 7 = 35</math> square units or, in general, <math>\ell \times w</math>.</p>   |
| <p><b>Perimeter of Rectangles</b><br/>Students count the number of linear units surrounding the rectangle. To count more efficiently, they can take the measure of the length plus the width and double that amount. They can also calculate two lengths plus two widths to get the perimeter of a rectangle.</p>                         | <p>The perimeter of the figure above is <math>2(7 + 5)</math> or <math>2 \times 7 + 2 \times 5</math> or, in general, <math>2(\ell + w)</math> or <math>2\ell + 2w</math>.</p>   |
| <p><b>Area of Triangles</b><br/>Students use their knowledge of rectangles to find the area of triangles. If we surround a triangle with a rectangle, we can see that the area of the triangle is half of the area of the rectangle. The triangle may be turned to a convenient side as the base, if needed.</p>                          |  <p>Sections 1 and 2 are congruent. 3 and 4 are congruent. The area of the triangle is <math>\frac{1}{2} b \times h</math> where <math>b</math> is the base of the triangle (length of the rectangle) and <math>h</math> is the height of the triangle (width of the rectangle).</p> |
| <p><b>Perimeter of Triangles</b><br/>Students find the perimeter of a triangle by measuring the lengths of the three sides and adding them together.</p>  | <p>The perimeter of the triangle is <math>7 + 10 + 12.2</math>, or 19.2 ft.</p>   |
| <p><b>Area of Parallelograms</b><br/>Students draw a diagonal creating two congruent triangles. The parallelogram and triangle have the same length of the base and height. Students find the area of the parallelogram by multiplying the base and height, without dividing by two, as they did when finding the area of a triangle.</p> | <p>The area of a parallelogram is the area of two triangles <math>2 \times (\frac{1}{2} b \times h)</math>, or just <math>b \times h</math>.</p>    |
| <p><b>Perimeter of Parallelograms</b><br/>The perimeter of parallelograms is found by measuring the lengths of the four sides and adding them together.</p>   | <p>The perimeter of the parallelogram is <math>2(5 + 6)</math> or <math>2 \times 5 + 2 \times 6 = 22</math> cm.</p>   |
| <p><b>Area of Circles</b><br/>Students find the number of "radius squares," whose side lengths are equal to the radius, that cover the circle. They find they need a little more than three, or pi.</p>   | <p>The area of a circle is <math>\pi \times</math> a "radius square" or <math>\pi \times \text{radius} \times \text{radius} = \pi \times r \times r = \pi r^2</math></p>    |
| <p><b>Perimeter of Circles (Circumference)</b><br/>Students count the number of diameter lengths needed to surround the circle. It is a little more than three, or pi.</p>  | <p>The circumference of a circle is <math>\pi \times \text{diameter} = \pi d</math>.</p>   |

On the **CMP Parent Web Site**, you can learn more about the mathematical goals of each unit, see an illustrated vocabulary list, and examine solutions of selected ACE problems. <http://PHSchool.com/cmp2parents>