

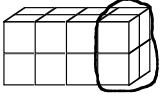
Grade 5, Unit Three: Geometry & Measurement

In this unit your child will:

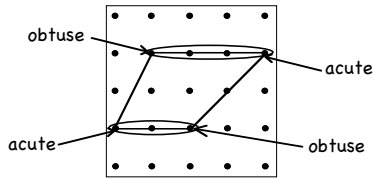
- identify and draw specific kinds of angles and line segments
- identify and draw similar and congruent shapes, as well as symmetrical shapes
- identify and draw different kinds of polygons
- locate points on a coordinate grid
- flip, slide, and turn different shapes and predict the results of transformations before completing them
- calculate the area of triangles and quadrilaterals
- measure angles with a protractor
- apply the fact that the angles in every triangle add up to 180° and the angles in every quadrilateral add up to 360°
- calculate the volume and surface area of 3-D shapes



Your child will learn and practice these skills by solving problems like those shown below. Keep this sheet for reference when you're helping with homework.

Problem	Comments
<p>Find the volume of this building made of centimeter cubes. Show all your work.</p>  <p>There are 4 cubes in this slice. The building has 4 slices like this. So altogether there are 4×4 cubes. That's 16 cubes, so the volume is 16 cubic centimeters.</p> <p>Find the surface area of the cube building. Show all your work.</p> <p>The faces on the ends are 2-by-2 squares. So they are each 4 sq. cm. That's 8 sq. cm. The other faces are all 2-by-4 rectangles. They are 8 sq. cm each and there are 4 of them, so that's 32 sq. cm. Altogether, the surface area is $8 \text{ sq. cm} + 32 \text{ sq. cm} = \underline{40 \text{ sq. cm}}$</p>	<p>In later grades, students will apply formulas to find the volume and surface area of different three-dimensional shapes. (Supplemental materials are provided with the curriculum for teachers in districts and states where fifth graders are expected to learn such formulas.) For now, it is important for students to apply their knowledge about volume and surface area to devise their own methods of calculating them. When the time comes to learn formulas, students will be better able to apply those formulas with understanding and will remember them more easily.</p>

Draw a shape with 2 acute angles, 2 obtuse angles, and only 1 pair of parallel sides. Label all of these features in your drawing.



I circled the two sides that are parallel.

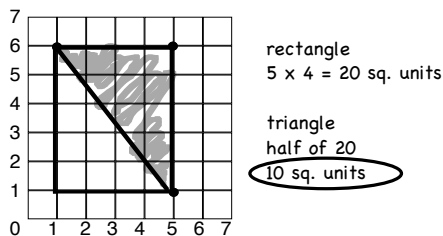
What is the name of the shape you drew? Be as specific as you can and explain how you know.

It is a trapezoid. I know because it has 4 sides and only 2 of them are parallel.

Students show a deep understanding of shapes and their properties when they can draw shapes with specific attributes and then name them with precise vocabulary. Although studying geometry requires that students learn new vocabulary, memorizing words and their meanings is not the goal of this unit. Rather, the vocabulary allows students to express and explore geometric ideas with greater precision. This unit is far more than an extended vocabulary lesson: it is an in-depth study of shapes, their attributes, and the relationships among them.

Plot these points on the grid and then connect them.

(5, 1) (5, 6) (1, 6)



What is the name of this shape? **right triangle**

Find the area of the shape above. Show all your work.

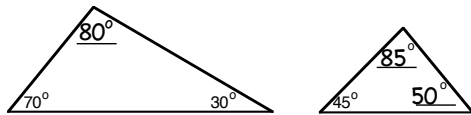
See work above. The area is 10 sq. units.

Problems like this one integrate many new skills and concepts, including finding the area of a triangle. The student found the area by drawing a rectangle around the triangle. The area of the triangle is half the area of that rectangle, in other words, half of the product of the length and width of the rectangle. When students have found the area of triangles this way, the formula makes good sense to them:

$$\text{Area of a triangle} = \frac{1}{2} \times \text{base} \times \text{height}$$

When students understand where formulas like this come from, they remember them better and apply them appropriately and accurately.

Find the number of degrees in each unlabeled angle below.



To find the measure of the unknown angle in the first triangle, the student can use the fact that the angles in any triangle add up to 180°. The labeled angles add up to 100°, so the third angle must be 80°. The student must use a protractor to find the angle measures in the second triangle.

A note about vocabulary in this unit: Homework assignments include definitions of the geometric vocabulary words used. You can also print out a list of vocabulary words and their definitions (including pictures and examples) from the Math Learning Center Web site:

<http://www.mathlearningcenter.org/resources/materials/parents/parents5.asp>

You can also look up words in your dictionary at home or in any number of online math dictionaries for students. We recommend www.amathsdictionaryforkids.com.