
The Concept of Area

This unit extends student work with measurement by introducing the concept of area. It reinforces three skills that are fundamental to measuring:

- choosing a unit
- finding the number of times the unit is contained in an object or figure
- reporting a measurement using a number and a unit

Beginning in kindergarten, we develop a conceptual understanding of **area** as the amount of space that a shape covers. In this unit, students first estimate the relative areas of different shapes by covering the shapes with a nonstandard unit of area measure—pennies. Later, they use a common standard unit for area measure—square inches. Students cover shapes with square-inch tiles to get more accurate measures of area. Finally, students measure area using non-standard square units of indeterminate size. They use skip counting and simple addition to count the square units inside a shape.

In second grade, students progress to finding the area of shapes built on square centimeter grids. In third grade, students use similar techniques to estimate the area of irregular shapes that do not fall neatly on a grid. These concepts are extended in fourth and fifth grades to include developing formulas for finding the areas of rectangles and triangles. Students also use area models to explore multiplication and division in Grades 3 and 4 and eventually

extend that model to fractions. The fundamental concept stressed in all grades is that area can be found by covering a surface with square units and counting them.

The activities in Unit 8 stress two important ideas about area. Students discover that the area of an object is dependent on its length in *two* dimensions. This sometimes creates conceptual difficulties for young students, who may tend to focus on one dimension when comparing the size of two figures. For example, some students might think that a taller rectangle is bigger than a shorter one without considering the width of the rectangle. Students also explore the idea that two different shapes can have the same area.

Math Facts and Mental Math

Addition Facts. Students work on developing number sense and mental math strategies for the addition facts with sums to ten in Group D. See *Mathematics In This Unit* in Unit 6 for more about addition facts development in Grade 1.

Group D: $3 + 3$, $3 + 4$, $4 + 4$, $4 + 5$

These facts involve the doubles and doubles plus one or minus one strategy. For example, $3 + 3 = 6$ so $3 + 4$ is one more, or 7.