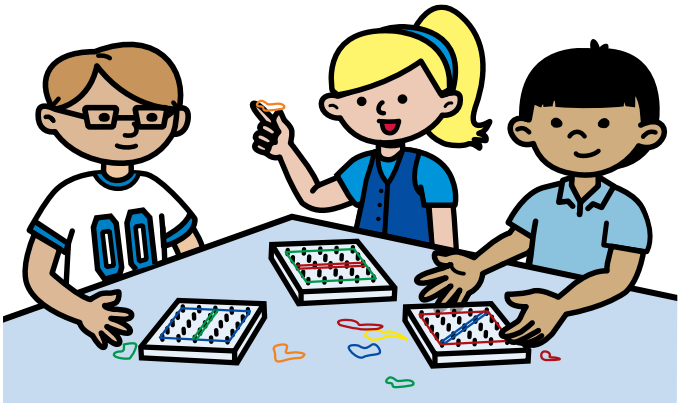
Bridges in Mathematics
Grade 2 Unit 6

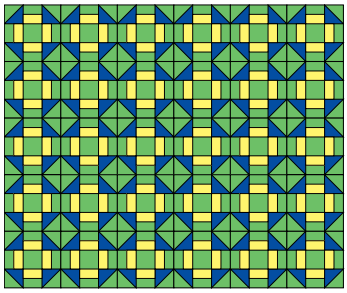
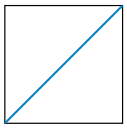
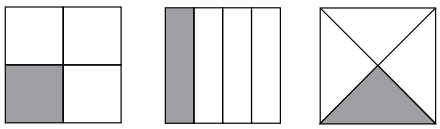
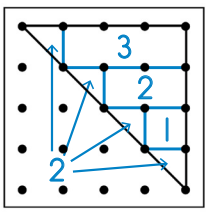
Geometry

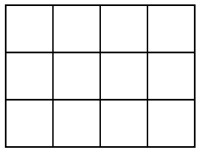


In this unit, your student will:

- Identify, describe, draw, and create two-dimensional shapes
- Work with arrays
- Divide circles and rectangles into halves and fourths
- Recognize that equal parts of identical wholes do not need to be the same shape
- Continue to add and subtract to 20

Your student will practice these skills by solving problems such as these:

PROBLEM	COMMENTS
What squares can you find in this quilt? 	Students work with quilt blocks throughout Unit 6. They divide the square blocks into halves and fourths in various ways and put together multiple iterations of identical blocks to create a class Hidden Squares Quilt. The completed quilt, shown here, invites observations about fractions and two-dimensional shapes such as squares, rectangles, and triangles. Consider looking for similar designs in your student's everyday life and inviting them to ask and answer math questions about the quilt.
Draw a line to divide the square into 2 equal parts. Then write the fraction used to name each part.  Each part is one-half of the whole space.	Dividing shapes into halves and fourths is something you can explore with your student during mealtimes. For example, you might have them help you divide a pizza into fourths or look for more than one way to cut a piece of bread in half. The square in this problem, for example, could also be divided into halves by drawing a vertical or horizontal line through the center.
Daniel cut 3 identical sandwiches into fourths. Is a fourth of one sandwich the same size as a fourth of one of the other sandwiches? How do you know? 	Although reason might tell us that fourths of identical squares must be the same size, the triangular fourths can appear to be larger than the square and rectangular fourths. Students explore this problem in a series of sessions and come to the generalization that equal shares of identical shapes do not have to be the same shape.
If a small 4-peg square has a value of 1 unit, what is the value of this triangle?  3 + 2 + 1 + 2 = 8 value = 8 units	Problems like this one encourage students to break apart shapes into smaller shapes and reason about fractions of shapes. Such problems also prepare them to work with area in third grade. This problem is presented by showing a shape on a geoboard, a math tool featuring 5 rows of 5 pegs. Students stretch rubber bands around the pegs to make a variety of shapes. If you haven't used a geoboard before, you might try exploring the Geoboard app.

PROBLEM	COMMENTS
How many squares are in the array? Write an addition equation to show your thinking.  4 + 4 + 4 = 12 or 3 + 3 + 3 + 3 = 12	An array is an arrangement of objects into equal rows and columns. The total number of objects in an array can be represented using repeated addition. The work with arrays in this unit prepares students for their work with multiplication in third grade, when they will represent arrays like the one in this problem using equations like $4 \times 3 = 12$ or $4 \times 3 = 12$.

Frequently Asked Questions About Unit 6

Q: I can't remember what some of the geometry words mean. Where can I go for help?

A: Geometry words let us name shapes and talk about them in precise ways. See the attached Geometry Vocabulary Terms pages for a refresher. You can also find these vocabulary cards in the Math Vocabulary Cards app by selecting the geometry set.

Q: Why is geometry important?

A: Studying geometry gives students ways to analyze the physical world. The skills students develop now, including the vocabulary they will come to understand and use with confidence, will help them in high school geometry, trigonometry, physics, and calculus. An additional benefit of studying geometry is that many students with strong spatial sense — for example, the ability to visualize and manipulate shapes in their minds — blossom when they are engaged in the kind of spatial problem solving featured in this unit.

Q: How can I support my student's learning?

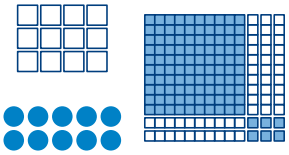
A: Geometry is all around us! Have your student look for examples of two-dimensional shapes in their everyday lives. In particular, encourage your student to notice and describe rectangles, triangles, circles, rhombuses, trapezoids, and parallelograms. Also encourage your student to look for fractions throughout the day.

To further support your student in learning mathematics, you can:

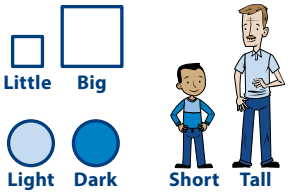
- Visit mathathome.mathlearningcenter.org and work through some or all of the activities in Grade 2: Set 6 together. These activities complement the learning that takes place in the classroom during Unit 6 and provide fun ways to engage children in mathematical thinking. This set also includes digital versions of familiar games that your student has learned at school, such as Fill for Less.
- Visit apps.mathlearningcenter.org and invite your student to explore the Geoboard, Pattern Shapes, and Fractions apps. Throughout Unit 6, students explore these tools in their physical forms in the classroom.
- Read books with your student that focus on two-dimensional shapes and fractions. Some suggestions include:
  - *If You Were a Quadrilateral* by Molly Blaisdell, illustrated by Francesca Carabelli
  - *The Greedy Triangle* written by Marilyn Burns, illustrated by Gordon Silveria
  - *The Trapezoid Is Not a Dinosaur* by Suzanne Morris
  - *Shape Up!: Fun with Triangles and Other Polygons* by David A. Adler, illustrated by Nancy Tobin

Geometry Vocabulary Terms page 1 of 2

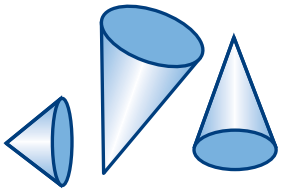
array an arrangement of items into equal rows and columns



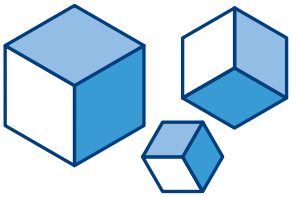
attribute a characteristic such as color, shape, size, etc.



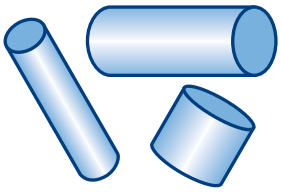
cone a three-dimensional shape with a circular or elliptical base and a curved surface that tapers to the vertex



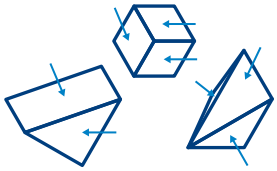
cube a three-dimensional shape whose 6 faces are all squares



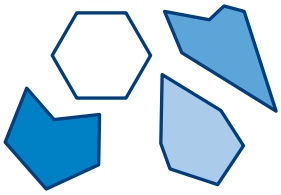
cylinder
a three-dimensional shape with one curved surface and two congruent bases that are circular or elliptical



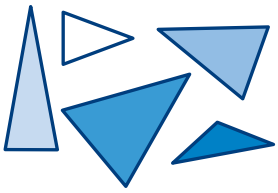
face a two-dimensional (flat) surface of a three-dimensional shape (solid)



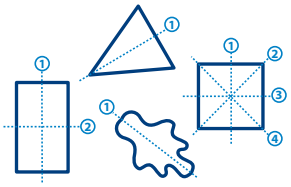
hexagon
a two-dimensional closed shape with 6 sides



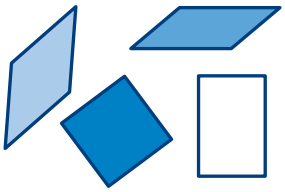
isosceles triangle
a triangle with exactly two congruent sides



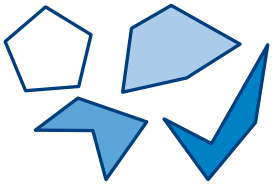
line of symmetry
a real or imaginary line that divides a shape into two mirror images



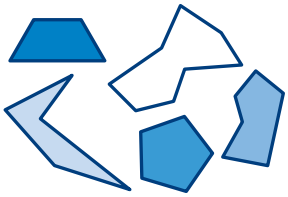
parallelogram
a 4-sided, two-dimensional closed shape with 2 pairs of parallel sides



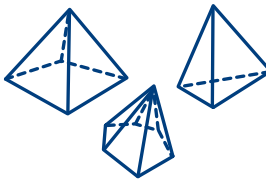
pentagon
a two-dimensional closed shape with 5 sides



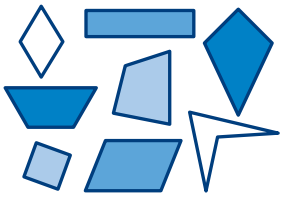
polygon
a two-dimensional shape with 3 or more sides



pyramid
a three-dimensional shape that has a polygon for a base; its other faces are triangular and meet at a vertex (called the apex)



quadrilateral
a two-dimensional closed shape with 4 sides



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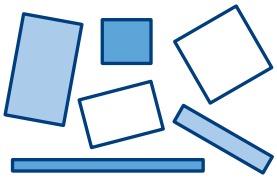
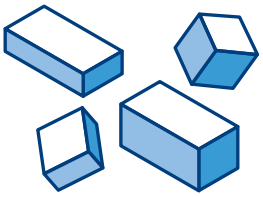
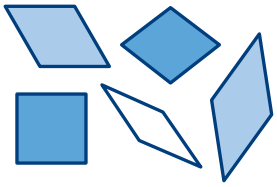
rectangle
a 4-sided, two-dimensional closed shape with 2 pairs of parallel sides and 4 right angles



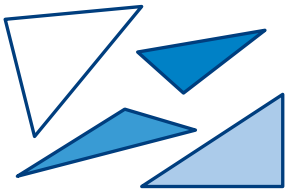
rectangular prism
a three-dimensional shape with two congruent rectangles for bases; its other faces are parallelograms



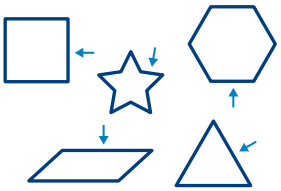
rhombus a 4-sided, two-dimensional closed shape with 4 congruent sides



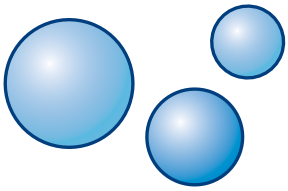
scalene triangle
a triangle whose sides are all of different lengths



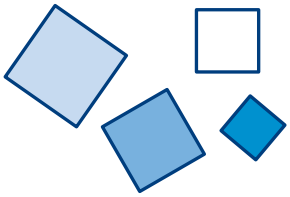
side a line segment that, with other line segments, forms a two-dimensional (flat) shape



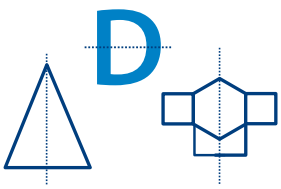
sphere
a three-dimensional shape constructed so that every point of the surface is the same distance from a point called the center



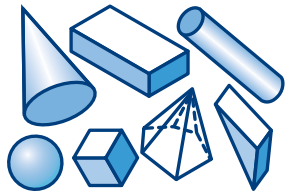
square a 4-sided, two-dimensional closed shape with 4 congruent sides and 4 right angles



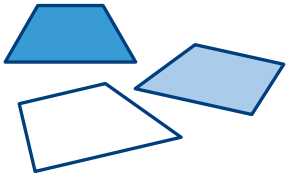
symmetry the property of a shape that can be folded so that the two halves match exactly



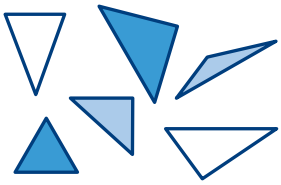
three-dimensional (3-D) shape a solid shape with depth, width, and height; a shape that has volume



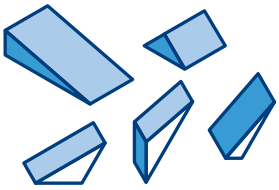
trapezoid a 4-sided, two-dimensional closed shape with exactly 1 pair of parallel sides



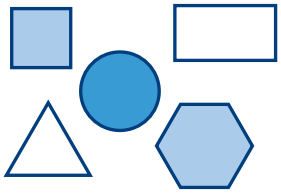
triangle
a two-dimensional shape with 3 sides



triangular prism
a three-dimensional shape with two congruent triangles for bases; its 3 other faces are parallelograms



two-dimensional (2-D) shape a flat shape with length and width; a shape that has area but not volume



vertex or corner
the point at which the sides of a two-dimensional closed shape or the edges of a three-dimensional shape intersect