

Parent Packet

HAUPPAUGE MATH

DEPARTMENT

CCLS

Grade K

MODULE 6

<http://www.hauppauge.k12.ny.us/math>

Grade K Module 6

Analyzing, Comparing, and Composing Shapes

Kindergarten comes to a close with another opportunity for students to explore geometry in Module 6. Throughout the year, students have built an intuitive understanding of two- and three-dimensional figures by examining exemplars, variants, and non-examples. They have used geometry as a context for exploring numerals as well as comparing attributes and quantities. To wrap up the year, students further develop their spatial reasoning skills and begin laying the groundwork for an understanding of area through composition of geometric figures.

Module 6

Topic A

Building and Drawing Flat and Solid Shapes

In this final kindergarten module, students will extend and build upon their learning about two- and three-dimensional shapes from Module 2. Students use their knowledge about common features of flats and solids to create, construct, and compose shapes by building and drawing. Throughout, they use ordinal numbers to describe the systematic construction of their flats (**K.CC.4d**).

Lesson 1 asks students to apply their knowledge of shape attributes (number and type of sides and corners) by constructing flat shapes using straws and clay (**K.G.5**). For example, when constructing a triangle, the student uses three equal, unconnected straws and connects the endpoints to form a three-sided, closed figure. This represents a departure from viewing the figure as being inclusive of the interior to now considering the shape as represented only by the outline, a perspective that will eventually develop into formal definitions of triangles, quadrilaterals, and polygons (e.g., a triangle is formally defined in Grade 4 as consisting of three non-collinear points together with the three segments joining them). Students will use ordination to thirds to tell the steps they take to build their flat shapes (**K.CC.4d**).

Topic B

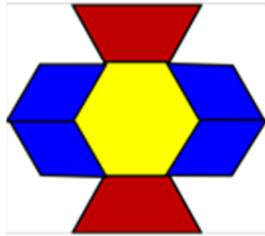
Composing and Decomposing Shapes

Topic B expands students' thinking about shape by introducing the notion that simple shapes can be combined to compose larger shapes (**K.G.6**).

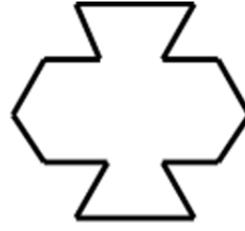
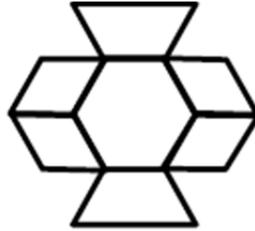
In Lesson 5, students use pattern blocks as templates to compose other shapes and pictures. For example, they make a rectangle from two squares and use a square and a triangle to make a pentagon or "house" shape.

Lesson 6 has students explore how to decompose a flat shape into two or more flat shapes. For example, students find that a rectangle can be decomposed into two triangles, two squares, or even a square and two smaller rectangles. Students record their explorations by drawing the hidden shapes within a larger shape. The Problem Set extends puzzle work as students combine shapes to complete pattern block templates of increasing complexity (see Geometry progressions document, p. 7).

This leads into Lesson 7 wherein students cut a square to form simple three-piece puzzles and intuitively use geometric motions such as flips, turns, and slides as they work to solve one another's puzzles. Lesson 8 hosts the Math Olympics, a culminating task that celebrates student learning from the whole year. Students complete tasks related to measurement, operations, and geometry.



Simple



Complex

Analyzing, Comparing, and Composing Shapes

OVERVIEW

The kindergarten chapter of *A Story of Units* comes to a close with another opportunity for students to explore geometry. Throughout the year, students have built an intuitive understanding of two- and three-dimensional figures by examining exemplars, variants, and non-examples. They have used geometry as a context for exploring numerals as well as comparing attributes and quantities. To wrap up the year, students further develop their spatial reasoning skills and begin laying the groundwork for an understanding of area through composition of geometric figures.

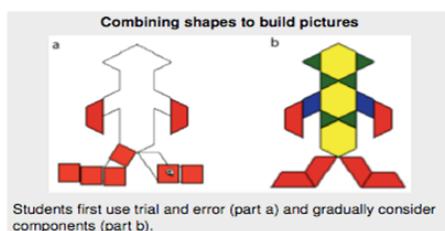
Topic A begins with students applying their knowledge of attributes to analyze two- and three-dimensional shapes from the real world and construct models using straws and clay. “Let’s use the straws to make the sides of the rectangle, and we’ll stick the straws together at each corner using clay!” Students use their understanding of ordination to thirds to share and communicate the systematic construction of flats and solids. “First, I cut four straws to be the same length. Second, I made a square by placing the four straws so they look like a frame. Third, I connected the sides at the corners with four little clay balls”.

As in Module 2, students explore the relationship between flats and solids, this time using flats to build solids. “I made my square into a cube. First, I made another square the same size. Second, I attached the two squares with four straws the same length.” They also apply their knowledge of ordinal numbers to describe the relative position of shapes within a set. “The yellow circle is first, and the red square is tenth.”

The lessons of Topic B focus on composition and decomposition of flat shapes. Students begin by using flats to compose geometric shapes. “I put two triangles together to make a square.” They then decompose shapes by covering part of a larger shape with a smaller shape and analyzing the remaining space. “When I cover part of my square with this triangle, I can see another triangle in the empty space.”

As they build competence in combining and composing shapes, students build toward more complex pictures and designs. Students progress through combining shapes to form

stages as they build competence in com-



pictures: beginning with trial and error and gradually considering the systematic combination of components. “This square fits here because the corners match the puzzle.” The culminating task of this module is set up as a Math Olympics, a celebration of student learning from the whole year. Students complete tasks related to number, measurement, operations, and geometry.

Composition and decomposition of geometric figures reinforce the idea that smaller units can combine to form larger units. This concept, central to *A Story of Units*, underlies not only area concepts but also the base ten number system. Students leave this module and the kindergarten year prepared to tackle the mathematical concepts of first grade and beyond.

Terminology

New or Recently Introduced Terms

First, second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth (ordinal numbers)

Familiar Terms and Symbols

Above, below, beside, in front of, next to, behind (position words)

Circle

Cube (three-dimensional shape)

Cylinder (three-dimensional shape)

Face (two-dimensional side of a solid)

Flat (two-dimensional shape)

Hexagon (flat figure enclosed by six straight sides)

Rectangle (flat figure enclosed by four straight sides)

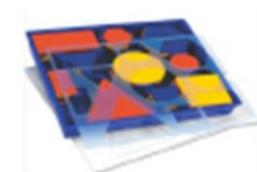
Solid (three-dimensional shape)

Cone (three-dimensional shape)

Sphere (three-dimensional shape)

Square (flat figure enclosed by four straight, equal sides)

Triangle (flat figure enclosed by three straight sides)



Suggested Tools and Representations

Pattern block activity cards or attribute block activity cards

Three-dimensional shapes: cone, sphere, cylinder, and cube

Two-dimensional shapes: circle, hexagon, rectangle, square, and triangle

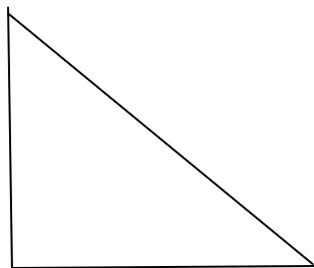
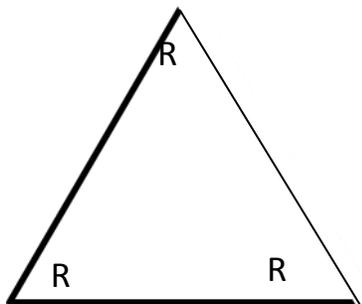


Lesson 1

Objective: Describe the systematic construction of flat shapes using ordinal numbers.

Listen to the directions.

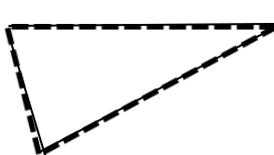
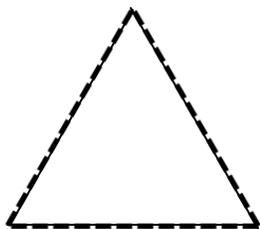
First, draw the missing line to finish the triangle using a ruler. **Second**, color the corners red. **Third**, draw another triangle.



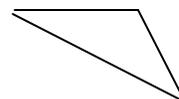
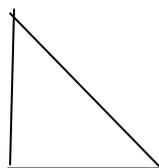
Lesson 2

Objective: Build flat shapes with varying side lengths and record with drawings.

First, use a ruler to trace the shapes. Second, draw the shapes using your ruler following the directions in the box.



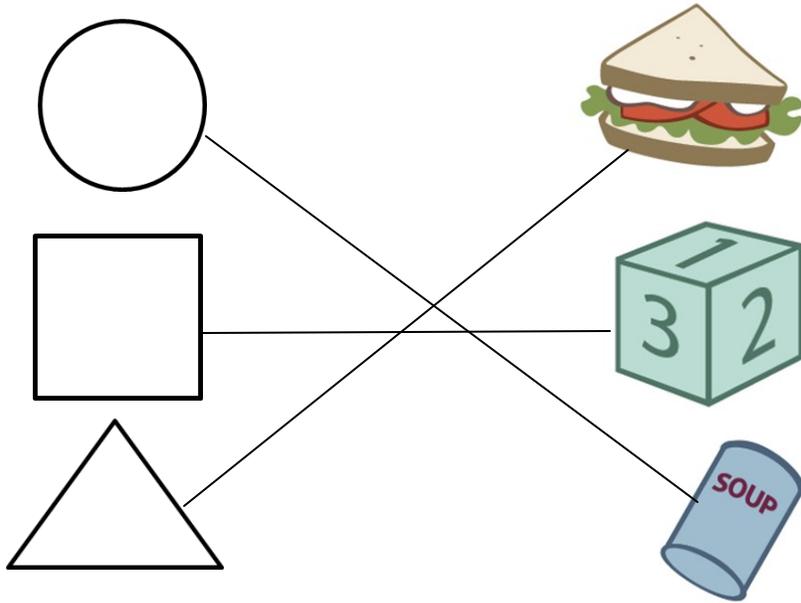
Draw 3 different triangles.



Lesson 3

Objective: Compose solids using flat shapes as a foundation.

Draw a line from the flat shape to the object that has a face with that flat shape.

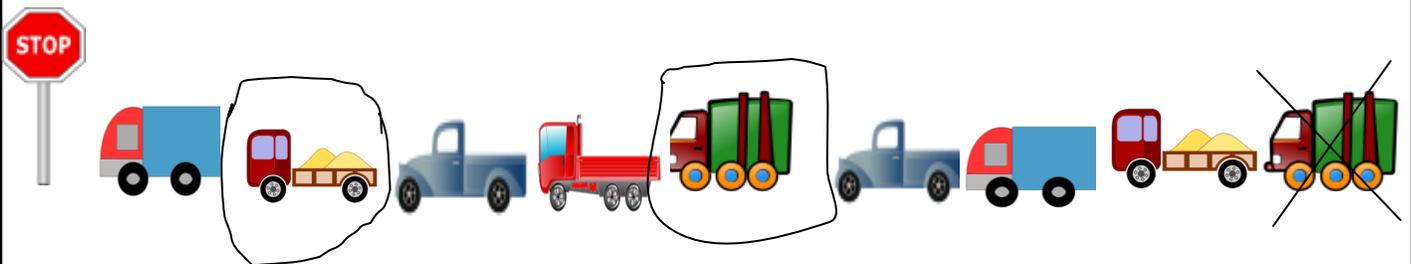


Lesson 4

Objective: Describe the relative position of shapes using ordinal numbers.

Circle the 2nd truck from the stop sign. Draw a square around the 5th truck.

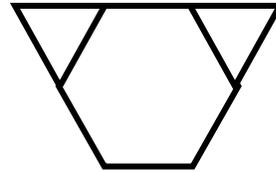
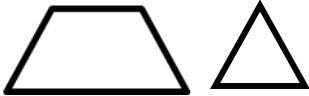
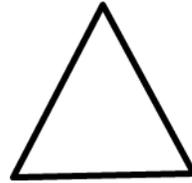
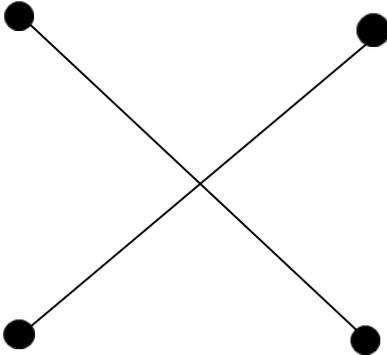
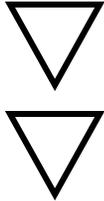
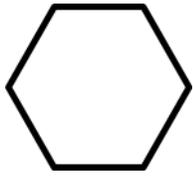
Draw an X on the 9th truck.



Lesson 5

Objective: Compose flat shapes using pattern blocks and drawings.

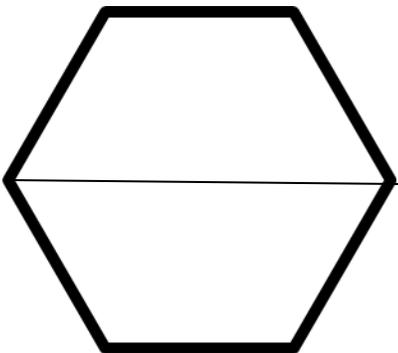
Match each group of shapes on the left with the new shape they make when they are put together.



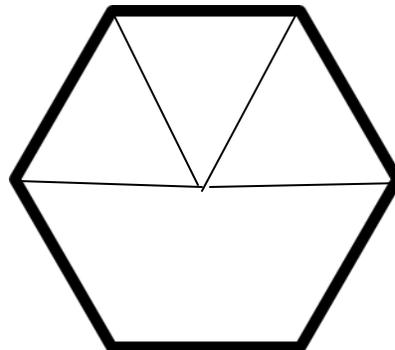
Lesson 6

Objective: Decompose flat shapes into two or more shapes.

Trace to show 2 ways to make each shape. How many shapes did you use?



I used 2 shapes.

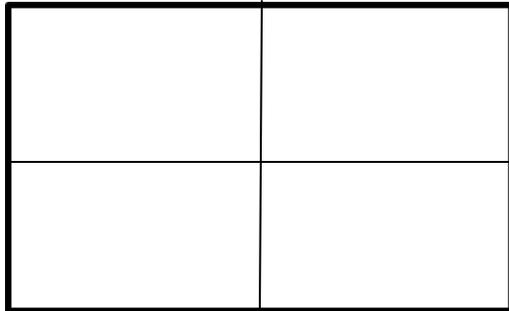


I used 4 shapes.

Lesson 7

Objective: Compose simple shapes to form a larger shape described by an outline.

Using your ruler, draw 2 straight lines from side to side through the shape. Describe the new shapes you made to an adult.



I made 4 rectangles from 1 rectangle.

Lesson 8

Objective: Culminating Task—Review selected topics to create a cumulative year-end project.

There is no homework for lesson 8.

Technology Resources

www.k-5mathteachingresources.com -This site provides an extensive collection of free resources, math games, and hands-on math activities aligned with the Common Core State Standards for Mathematics.

www.parccgames.com – fun games to help kids master the common core standards.

<http://www.mathplayground.com> –common core educational math games and videos.

www.learnzillion.com – math video tutorials.

www.ixl.com – practice common core interactive math skills practice.

www.mathnook.com –common core interactive math skill practice/ games, worksheets and tutorials.

www.adaptedmind.com – common core interactive practice, video lessons and worksheets

www.brainpop.com – animated tutorials of curriculum content that engages students. Can use a limited free version or buy a subscription.