GRADE K • MODULE 2

Two-Dimensional and Three-Dimensional Shapes

Students began the year observing their world. What is exactly the same? What is the same but...? They matched and sorted according to criteria sequenced from simple to complex. Their perceptions evolved into observations about numbers to 10. "4 is missing 1 to make 5." "4 plus 1 more is 5." "There is the same number of dogs and flowers, 6!"

Now, students will seek out flat and solid shapes in their world (**K.G.1**). Empowered by this lens, they begin to make connections between the wheel of a bicycle, the moon, and the top of an ice cream cone. Just as the number 4 allowed them to quantify 4 mountains and 4 mice as equal numbers, learning their flats and solids allows them to see the relationship of the simple to the complex, a mountain's top to a plastic triangle and cone sitting on their desk.

Terminology

- Above, below, beside, in front of, next to, behind (position words)
- Circle
- Cube (three-dimensional shape)
- Cylinder (three-dimensional shape)
- Face (flat 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)

Topic A: Two-Dimensional Flat Shapes

To open Topic A, students find and name shapes in their environment using informal language, describing flat shapes without naming them.

In Lesson 1, students use the informal language of their everyday world to name and describe flat shapes without yet using mathematical concepts and the vocabulary of geometry. They are not yet able to consistently distinguish between examples and non-examples of different groups of shapes such as triangles, circles, squares, rectangles, or hexagons. At this stage, a figure is a square because it looks like a book; another figure is a circle because it is round like the wheel of a car. Students make these observations without explicitly thinking about the attributes or properties of squares or circles.

In Lesson 2, students build on their experiential learning by the mathematical concept and vocabulary of geometry, allowing them to enhance their experiences of shapes. They begin to classify three-sided shapes by identifying them as examples of a triangle. Using various examples and non-examples of triangles, they sort and classify different shapes as examples of a triangle or not a triangle. Having learned to identify shapes as triangles, they explain their decisions about classifying shapes as triangles and other shapes as not triangles by focusing on common attributes or properties of the shapes they have identified as triangles.

Lessons 3 and 4 continue the work of Lesson 2 in the same vein by identifying shapes as rectangles, hexagons, and circles.

In Lesson 5, students communicate about the relative position of shapes by using terms such as above, below, next to, beside, in front of, and behind. They manipulate all the flat shapes using position words as the teacher gives directives such as, "Move the closed shape with three straight sides behind the shape with six straight sides." These positioning words are subsequently woven into the instructional program, at times in math fluency activities, but also throughout the entire school day.

Topic B: Three-Dimensional Solid Shapes

The lessons of Topic B reiterate those of Topic A but with solid shapes. Lesson 6 begins with students finding solid shapes in their environment. They might find bottles of paint, tissue boxes, balls, or crayons, and describe their object to their neighbor using informal language. "My ball is round and it bounces!" "This tissue box has a lot of pointy corners." Some students might even use the flat shape vocabulary they learned in Topic A to describe their solid shape. "There are a lot of rectangles on my tissue box, too."

Lesson 7 continues with learning the names of the solid shapes and focusing on their attributes. Students are asked to explain their thinking as they classify the solid shapes into categories. "I'm putting all the cubes and rectangular prisms together because they all have six sides." "The spheres and the cylinders roll, they should go together." Lesson 8 guides the students to use their new solid shape lexicon to communicate the position of solid shapes to each other. In this lesson, the students identify, name, and position shapes relative to each other.

Topic C: Two-Dimensional and Three-Dimensional Shapes

Topic C closes the module with discrimination between flats and solids. In Lesson 9, students are identifying and sorting flat and solid shapes. The goal of this lesson is to focus the student's attention on the attributes of a flat or solid shape instead of trusting how it looks. The students will learn to sort shapes and explain the reason for their groups.

Young children might group the first and third shapes because "they look like triangles," but not the second shape because "it doesn't look like other triangles." This module closes with a culminating task which asks students to distinguish between variants, non-examples, and examples of flat shapes. The task continues as students relate the flat shapes to solid shapes as they create a solid and flat shape display.

Fluency:

The fluency components in the lessons of Module 1 included activities wherein students used a variety of triangles and rectangles to practice their decompositions of 3 and 4. Flats and solids will continue to be included in fluency activities all through the year so that students have repeated experiences with shapes, their attributes, and their names. Daily number fluency practice in this new module is critical. There are two main goals of consistent fluency practice: (1) to solidify the numbers of Module 1 and (2) to anticipate the numbers of Modules 3, 4, and 5. Therefore, students continue to work extensively with numbers to 10 and fluency with addition and subtraction to 5.