



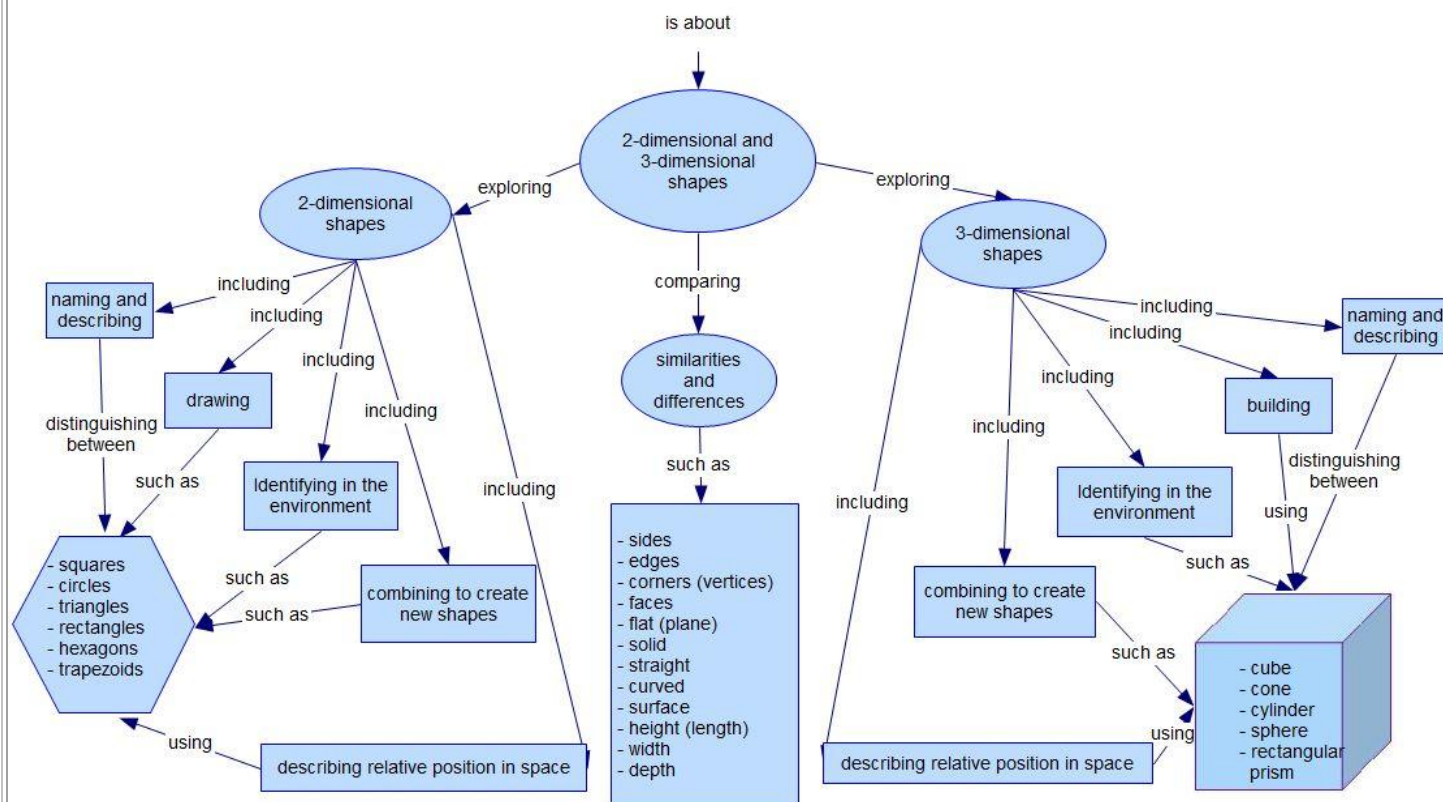
Unit: 6 - Exploring Attributes and Shape Part 2 (Week 30, 8 Weeks)

Common Core Initiative

Overarching Questions and Enduring Understandings

What role do shapes have in our world?

Graphic Organizer



Unit Abstract

The focus of the Unit 1 was on the properties of 2-dimensional shapes, location, and spatial relationships. This unit builds on these concepts, extending them to 3-dimensional shapes.

Free exploration of solid geometric objects over time is essential for developing spatial sense in kindergarten. It begins with play. The Block Center takes on increased importance in providing a setting for informal, but intentional, conversations about shapes and structures. Interacting with students at a Block Center and Shape Center affords an opportunity for asking questions and modeling mathematical language. As students build structures, ask them to identify the shapes they used to create their structures and their position relative to other objects. It is also critical to ensure that girls are engaged in these activities. They are not often found in the block area, so they miss out on these foundational geometry experiences.

Geometry has its own set of vocabulary that students need to hear and learn to use. Although students will not be expected to master this vocabulary by the end of kindergarten, teachers should take every opportunity to use mathematically correct language. It may also be necessary to clarify terms, as children often "try on" new vocabulary

without using it accurately. A set of Word Wall Cards with pictures is included in this unit. Although *rectangular prism* is not a figure named in the Common Core Standards, the greatest number of examples students find will likely be *rectangular prisms*. Therefore, that shape is included in the group of Word Wall Cards. More important in kindergarten than a focus on shape names, however, is fostering children's ability to *describe* (e.g., the attributes of a figure, a figure's relative position), to *analyze* (e.g., Why can a sphere roll, but a cube can't?), and to *make logical arguments* (e.g., why a scalene triangle is a triangle).

Because students enter school with many preconceived perceptions about geometric shapes, it's essential to surface those notions and both build on them and address misconceptions. There are four common misconceptions that may surface during this unit.

1. The misconception that all triangles are equilateral triangles was addressed in Unit 1.
2. A misconception that can be addressed by careful language on the part of the teacher is that 2-dimensional shapes that appear to be part of a 3-dimensional shape are used for the name of the 2-dimensional shape. Examples of this are calling a cube a square and a sphere a circle. If these misconceptions are not addressed when they become evident, they become perpetuated and are more difficult to correct in future grades. When students know the difference between 2-dimensional and 3-dimensional shapes, they will understand when you say; "It looks like a square, but if we turn it we see that there are six squares, so what do we call it?" or "It looks like a circle, so what do we call a 3-dimensional shape that looks like a circle in the picture?" "It is a ball; we call the shape of a ball a sphere." or "What part of the file cabinet is a rectangle?*"
 3. A third misconception that students develop is that a square is not a rectangle. Although it is premature to expect kindergartners to make this distinction, if students say that a square is not a rectangle, it is important to provide accurate information. If this question has surfaced, referring to squares as "square rectangles" helps to prevent the development of this misconception.
 4. Finally, it is common for students to think that a change in the orientation of a shape changes the shape. Having intentional conversations with students while they are exploring and playing with blocks and other 3-dimensional objects can draw students' attention to the fact that a rectangular prism is a rectangular prism, regardless of its orientation or the child's perspective.

A word about Standard 6: Children love to create pictures and structures with different paper shapes or with blocks in the Block Center. They create houses and snowmen and trucks and towers. They create designs. The challenge for teachers is to make sure that the mathematics is not lost in the creativity. A child may have created a road by stringing together a line of trapezoids. After acknowledging the road, a teacher can ask what he used to make the road and how he put them together. A child may build a tower with cylinders and place a cone on top. After hearing about the tower, the teacher can ask what shapes she used to build the tower. It's about seizing those teachable moments and making those mathematical connections.

*NOTE: In the interest of full disclosure, it is problematic to use pattern blocks as examples of 2-dimensional shapes, as is routinely done in most classrooms. Having access to paper pattern blocks is more accurate, but it is very time-consuming to produce those in the quantity needed. It is not necessary to make that distinction in kindergarten.

 [Unit Overview \(Word\)](#)

 [Unit Overview \(PDF\)](#)

Content Expectations/Standards	Unit Level Standards
Kindergarten, Geometry K.G.A. Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres). • K.G.A.1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to. • K.G.A.2. Correctly name shapes regardless of their orientations or overall size. • K.G.A.3. Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid"). K.G.B. Analyze, compare, create, and compose shapes. • K.G.B.4. Analyze and compare two- and three-dimensional shapes, in different sizes and	Not applicable

orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/“corners”) and other attributes (e.g., having sides of equal length). • K.G.B.5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes. • K.G.B.6. Compose simple shapes to form larger shapes. For example, “Can you join these two triangles with full sides touching to make a rectangle?”	
Essential/Focus Questions 1. What is the difference between a 2-dimensional and 3-dimensional shape? 2. What makes a cube (circle, sphere, cone, cylinder) a cube (sphere,.....)? 3. What is the relationship between the vertices, edges and faces of a 3-dimensional figure? 4. What 3-dimensional shapes do we see in our environment? 5. What shapes can we create by combining two or more shapes?	Key Concepts 2-dimensional 3-dimensional attributes circles classify cone cube curved surface cylinder depth flat flat surface hexagons length pyramid rectangles rectangular prism relative position solid sort sphere squares triangles width
Assessment Tasks  Assessment Overview  Student Handouts	Intellectual Processes Standards for Mathematical Practice <i>Students have opportunities to:</i> • construct viable arguments and critique the reasoning of others when describing and explaining the attributes of geometric shapes found in the environment and their relative position; • look for and make use of structure when comparing 2-dimensional and 3-dimensional shapes and when identifying geometric shapes in the environment; • look for and express regularity in repeated reasoning when recognizing that the name of the shape remains the same, regardless of its size and orientation and its location and physical features in the environment; and • uses appropriate tools strategically when combining shapes to create a larger shape.

Lesson Sequence	Resources
 Lesson Overview (PDF)  Basic Shapes (2-D 3-D) Powerpoint  2-Dimensional Shape Review Powerpoint  3-Dimensional Attribute Checklist  Demonstration Square Circle Triangle  Word Wall Vocabulary Pictures  Play Dough Recipes  Student Handouts	 Unit Resources  Professional Learning Task - Sorting Activity

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