Cluster 6: Distinguishing and Composing Shapes
Duration: 3 weeks

Content Standards:
This list includes standards addressed in this cluster, but not necessarily mastered, since all standards are benchmarks for the end of the year. Note strikethroughs and recommendations in the Important Considerations section for more information.
NC.1.G.1 Distinguish between defining and non-defining attributes and create shapes with defining attributes by: • Building and drawing triangles, rectangles, squares, trapezoids, hexagons, circles. • Building cubes, rectangular prisms, cones, spheres, and cylinders. **NC.1.G.2** Create composite shapes by: • Making a two-dimensional composite shape using rectangles, squares, trapezoids, triangles, and half-circles naming the components of the new shape. • Making a three-dimensional composite shape using cubes, rectangular prisms, cones, and cylinders naming the components of the new shape.

Mathematical Practices:
1. Make Sense of Problems and Persevere in Solving Them 2. Reason Abstractly and Quantitatively **3. Construct Viable Arguments and Critique the Reasoning of Others** **4. Model with Mathematics** **5. Use Appropriate Tools Strategically** **6. Attend to Precision** 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.

What is the mathematics?
- Early geometry is much more than vocabulary and naming shapes. It involves the development of spatial sense which is fostered through ongoing and significant experiences. Students should be encouraged to notice shapes in their everyday world as well as engage in experiences with models such as tangrams, attribute blocks, and pattern blocks.   - Students should be exposed to a wide variety of examples of a single type of shape (ex. triangle) and asked to look for what the shapes have in common in order to bring to light defining attributes of the shape. Providing examples and non-examples of shapes can also be helpful in highlighting defining attributes.   - Defining Attributes- number of sides, number of angles, closed figures   - Non-Defining Attributes- color, size, orientation   - In first grade, students use their understanding of defining attributes to identify, name, build, and draw triangles, rectangles, squares, trapezoids, hexagons and circles.   - Students combine rectangles, squares, trapezoids, triangles, and half-circles to create new composite shapes and describe the shapes within the new composite shapes they've created. (ex: Two triangles can be combined to make a square.)   - Students combine cubes, rectangular prisms, cones, spheres, and cylinders to create new composite shapes and describe the shapes within the new composite shapes they've created as cubes, rectangular prisms, cones, spheres, and cylinders

Important Considerations:
Students should be exposed to shapes in a variety of sizes and contexts to avoid misconceptions about the attributes for shapes. It is common for children to incorrectly

> identify shapes based on non-defining attributes such as color, size and orientation (ex: A child might recognize a square as having both vertical and horizontal lines). When the square is tilted (change in orientation), the child may no longer recognize the shape as a square but believe it has now become a diamond (not a mathematical term).
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> - Students should identify and describe 2D and 3D shapes in a variety of contexts (hallway walk, playground, etc.) Experiences should not be limited to the standard set of pattern and attribute blocks found in math kits. Special attention should be paid to instructional materials such as posters and literature used in the classroom as some may display inaccurate or imprecise examples of shapes.
> - It is common for students to identify 3D shapes by one of its faces (ex: A child might incorrectly identify a cube as a square). Students should be encouraged to identify all the faces of 3D shapes that can be described using the names of 2D shapes that students already know. Children can benefit from constructing 3D shapes from 2D shapes and then naming the new 3D shape that has been created.