Cluster 9: **Reasoning with Shapes**

Duration: 2-3 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.2.G.1
Recognize and draw triangles, quadrilaterals, pentagons, and hexagons, having specified attributes; recognize and describe attributes of rectangular prisms and cubes.
NC.2.G.3
Partition circles and rectangles into two, three, or four equal shares.
- Describe the shares using the words halves, thirds, half of, a third of, fourths, fourth of, quarter of.
- Describe the whole as two halves, three thirds, four fourths.
- Explain that equal shares of identical wholes need not have the same 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?
In this cluster, quantity and number sense can be emphasized within geometry. For example, students will use quantity to describe attributes and shares.
- Mathematical vocabulary is essential in this cluster. The use of words like partition, halves, thirds, fourths, attributes, and the proper shape names are very important.
- While the use of the term "fraction" is not explicitly stated in second grade, the concepts of recognizing how many parts a whole is partitioned into, and whether or not the parts are of equal shares are. The focus of standard NC.2.G.3 is on equipartitioning (partitioning in equal parts), and developing language such as halves, thirds, and fourths. Second grade students should not be introduced to symbolic notation for fractions (ex. Students may describe an amount as "a third," but is not expected to write ⅓).
- Students should have opportunities to draw and partition their own shapes, rather than solely use pre-partitioned representations. The experience of drawing their own shapes and partitions will allow students to develop the understanding that all parts must be equal.

Important Considerations
- 2D shapes and partitioning should be taught before 3D Shapes
- Partitioning can be introduced by folding paper shapes.
- When given a circle or rectangle, students must be able to recognize whether or not it is partitioned equally into two, three, or four shares. Sorting non-examples from examples are helpful with this skill.