Cluster 7: Classifying Quadrilaterals

***Duration*:** 1-2 weeks

Content Standards:
This list includes standards that will be addressed in this cluster, but not necessarily mastered, since all standards are benchmarks for the end of the year. Please note strikethroughs and recommendations in the Important Considerations section for more information.

NC.5.G.1
Graph points in the first quadrant of a coordinate plane, and identify and interpret the x and y coordinates to solve problems.
NC.5.G.3
Classify quadrilaterals into categories based on their properties.
- Explain that attributes belonging to a category of quadrilaterals also belong to all subcategories of that category.
- Classify quadrilaterals in a hierarchy based on properties.

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?
- Students were expected to identify attributes of quadrilaterals in fourth grade, but in fifth grade they are expected to classify them into a hierarchy to construct classifications based on hierarchy.
- Minimal defining lists help define the subset of properties that are essential to the identification of a shape. All figures that meet the criteria of the minimal defining list for a particular shape can be named as that shape (Ex. A parallelogram has four sides and two sets of parallel sides. All shapes that meet this criteria are parallelograms including squares, rectangles, and rhombuses).
- Students utilize true/false statements to demonstrate mastery of classifications and make arguments for their answers (ex. If is a square, then it is a rhombus. True, because a rhombus has four congruent sides and a square fits this definition).

Important Considerations:
- Classifying quadrilaterals into a hierarchy is a higher level of geometric thought. Even though students identified triangles and quadrilaterals in fourth grade, they may need additional experiences with sorting shapes and discussing the relationships between shapes based on attributes.
- Students learned to use a protractor to measure angles in fourth grade and can use angle measures as part of their noticing and conjecturing about shapes and how they are alike and different.
- Students need opportunities to draw and sketch shapes themselves rather than always being presented with pre-cut shapes.
- A variety of quadrilaterals should be used as to not limit students' experiences to the more traditional visual images (ex. Use a right trapezoid in addition to an isosceles trapezoid). A

variety of shapes shown in different orientations encourages students to focus on relevant properties to name shapes.

- Instructional resources sometimes use different definitions for quadrilaterals that make a difference in how they are classified. For example, when a trapezoid is defined as a quadrilateral with *at least* one set of parallel lines, a parallelogram is a type of trapezoid. When defined as *exactly one* set of parallel lines, a parallelogram is not a type of trapezoid. It is important to make sure to check the glossary of terms from DPI for definitions as those are the ones that will be used for testing purposes.
- Classifying quadrilaterals is easily integrated with coordinate graphing, which they explored in the first cluster (ex. Draw a square on the coordinate plane. What are the coordinates of its points?)