**Guess a Shape**

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| **This lesson engages students in recognizing and identifying the properties of plane geometric figures. *Students should learn that the properties of a shape to determine its name.***  **Strikethrough in standard indicates figures that are not a focus in this lesson.** |

**NC Mathematics Standards:**

**Identify and Describe Shapes**

**NC.K.G.2:** Correctly name squares, circles, triangles, rectangles, hexagons, ~~cubes, cones, cylinders, and spheres regardless of their orientations or overall size.~~

**Standards for Mathematical Practice:**

1. Attend to precision.

7. Look for and make use of structure.

**Student Outcomes:**

* I can recognize a plane figure.
* I can name basic properties of common plane figures.

**Math Language:**

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| * Squares * Circles * Triangles * Rectangles * Hexagon | Students should be exposed to, but not held accountable for using:   * Shape * Corners/Vertices/Vertex * Sides * Face |

**Materials:**

* sets of plane figures group of students (e.g., attribute blocks)
* puzzles for students to complete
* student recording sheets

**Advance Preparation**:

* Collect sets of shapes for students.
* Make a class set of the student recording sheet.

**Directions:**

1. Review two-dimensional shapes:
   * Show students the plane geometric shapes and ask them to name each. This allows the teacher to assess the level of knowledge of names of shapes and to guide instruction.
   * Place the plane figures in a paper bag. Have a student place hand inside the bag, select, and name the selected shape without looking. Then remove shape from the bag and show it to peers. Repeat this until students are familiar with the shapes.
2. Introduce the activity:
   * Organize students in pairs. Distribute bags of plane shapes to each pair.
   * Explain directions:
     + Partner A reaches in the bag, touches a shape, and guesses its name without looking. Partner A removes shape from bag and checks for accuracy. He/she colors the corresponding shape on the recording sheet.
     + Partner B takes a turn.
     + Turns continue until the teacher calls time.
     + Partners complete the bottom part of their recording sheet.
3. As students complete activity, circulate posing open-ended questions to access students’ thinking and understanding.

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| **Strategy used…** | **Questions to ask…** |
| Student says that the figure “looks like…”  Example: *It looks like a pointy hat.* | * Tell me how you know that is the name of the shape? * Tell me why you think it “*looks like*”…? * What do you notice about the different shapes? This focuses attention on the properties. * Please name the ***shape*** that resembles the “looks like…” object. This encourages the student to focus on the appropriate mathematical vocabulary.” This response is an indication that the student is functioning at level 1(visual level) of the Van Heile model of geometric thinking. See the following websites for more information.   + <https://nrich.maths.org/2487>   + <https://www.ukessays.com/essays/education/the-van-hiele-theory-of-geometric-thinking-education-essay.php> |
| Student provides limited description of the shape | * Are there other things (characteristics) about the figure that you notice? This encourages students to develop understanding and usage of geometric thinking at level 2 (descriptive/analytical) of the van Heile. * Please name the parts of the shape. |

1. As students work, observe methods students used to guess their shapes. Plan which students will share after the activity. Determine the sequence in which they will share their thinking (i.e., least to most sophisticated).
2. Bring class together for a discussion about their work.
   * Have selected students share their thinking, explaining how they decided which shape they were touching.
   * Discuss which shapes were easiest and most difficult to guess.
   * Ask: How did you decide if you were touching a triangle or hexagon? How did you decide if you were touching a square or rectangle?

**Evaluation of Student Understanding:**

**Informal Evaluation:**

* At the end of the lesson, have students repeat the task of naming shapes using the plane figures in a brown paper bag. Check for students’ recognizing the names of shapes appropriately. If students use properties to describe and/or identify figures, they are beginning to analyze and demonstrate moving toward level 2 of van Heile. Check the student drawings for ability to record shapes.

**Meeting the Needs of the Range of Learners:**

* Create flexible groups to work with different parts of the lesson. Some need experience in placing figures in the bag, naming, and withdrawing to confirm accuracy. Others need to explore with the shapes to create pictures with outlines of the component parts.

**Extensions:**

* Repeat this task to provide additional opportunities to identify and describe plane figures. Use this lesson for maintaining students’ familiarity with names of shapes.
* Add solid figures for students who grasp the plane figures.
* Have students turn and talk to a partner to share thinking. Encourage students to share their strategies and associations that allow them to identify and describe plane figures.

**Possible Misconceptions/Suggestions:**

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| **Possible Misconceptions** | **Suggestions** |
| * Students may confuse shapes, such as a triangle and a square because of the different number of sides. | * Be aware of the strategies students are using, and help students articulate them. Nudge students toward identify by comparing properties of shapes, such as the number of sides/vertices in a triangle and square. Such comparisons focus attention on similarities and differences. |
| * Students may not recall the appropriate math vocabulary for properties. | * Create labels for the properties: vertex, corner, and sides. Present a figure for the student to label the individual parts. |

**Special Notes:**

* Strikethrough indicates figures that are ***not*** a focus in this lesson.
* Geometric concepts need to be established in kindergarten to support student’s future mathematical success. Geometry is important for partitioning and fractions. Symmetry is related to equality and congruence (equality). Transformations (flips, turns and slides) are essential for spatial reasoning.
* Knowing the names and characteristics of plane figures is connected with seeing the relationship between plane and solid figures.

