**Geometry Hunt**

This lesson has been designed for students in grades 3-5 with the purpose of reviewing common geometric terms. In addition, students will expand their recall abilities and develop a deeper understanding of how geometric terms and figures relate to one another. First, students will hunt through the Building Blocks of Math: Moving Beyond Foundations books as well as their learning environment to define, sketch, and determine real-world examples of geometric terms. Next, students will apply that knowledge to complete one of four leveled, independent assignments to demonstrate their understanding of a variety of geometric terms and figures. This lesson includes multiple differentiation strategies and materials, such as a cloze-structure version of the Geometric Terms Note-Taking Guide to support a wide variety of student needs.

**Standards:**

**Common Core State Standards:**

* **Mathematical Practices**
  + **CCSS.Math.Practice.MP4** – Model with mathematics.
  + **CCSS.Math.Practice.MP7** – Look for and make use of structure.
* **3rd Grade**
  + **CCSS.Math.Content.3.G.A.1** – Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
* **4th Grade**
  + **CCSS.Math.Content.4.G.A.1** – Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
  + **CCSS.Math.Content.4.G.A.2** – Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
* **5th Grade** 
  + **CCSS.Math.Content.5.G.B.3** – Understand that attributes belong to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.

**Objectives:**

* Students will be able to define and provide examples of a variety of geometric terms.
* Students will be able to classify two-dimensional figures based on their attributes.

**Lesson Duration:** approximately 60-75 minutes

**Materials:**

* The Building Blocks of Math 2 series, specifically Geometry
* Geometric Terms Note-Taking Guide
* Geometric Terms Note-Taking Guide – Cloze Version
* Geometric Terms Note-Taking Guide Answer Key
* Pencils
* Scratch Paper
* Independent Application Worksheets:
  + Option A – Different Looks and Gym Floor Geometry
  + Option B – Keeping Busy and Signs from the Crowd
  + Option C – Show and Tell and A Plane Mess
  + Option D – Unique Spaces and/or Missing Sails
* Optional: Ruler and/or protractor (helpful for students completing Option D)

**Requisite Prior Knowledge:**

* Because this lesson is a review of geometric terms, students should have familiarity with the majority of the vocabulary words listed below. Students should understand that some geometric features are used to identify and describe other geometric figures. For example, a parallelogram is a type of quadrilateral classified by its geometric feature of having two pairs of parallel sides.
* In addition, because students are asked to take notes and include images, it may be beneficial to review the how to draw carefully while not taking too much time as well as the use of labels to clarify important aspects of sketches.

**Vocabulary (definitions available at the end of this document):**

* Plane
* Point
* Line
* Ray
* Endpoint
* Line segment
* Angle
* Vertex
* Right angle
* Acute angle
* Obtuse angle
* Straight angle
* Parallel lines
* Perpendicular lines
* Right triangle
* Acute triangle
* Obtuse triangle
* Scalene triangle
* Isosceles triangle
* Equilateral triangle
* Quadrilateral
* Square
* Rhombus
* Rectangle
* Parallelogram
* Trapezoid
* Polygon
* Regular polygon
* Irregular polygon

**Differentiation Considerations:**

* Two of the main differentiation options for this lesson come in the application activity portion of this plan. First, consider allowing students a choice of how many people as well as with whom they choose to collaborate. Choice is a great motivator for students and can help boost student engagement.
* Second, consider assigning some students the Cloze Version of the Geometric Terms Note-Taking Guide. This version uses a cloze structure and strategy to help students focus on the most important information and defining features of geometric figures.
* Finally, consider using leveled assignments in the independent work setting. Option A requires the least cognitive demand whereas Option D requires the highest cognitive demand. Consider allowing students, especially those who need additional support, to use their note-taking guides as they complete this independent activity.
  + Option A – Different Looks and Gym Floor Geometry
  + Option B – Keeping Busy and Signs from the Crowd
  + Option C – Show and Tell and A Plane Mess
  + Option D – Unique Spaces and/or Missing Sails

**Lesson and Instruction:**

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| **Lesson Components and Time Guidelines** | **Teacher Actions** |
| **Introduction/Hook**  Approximately 5 minutes | Explain to students that geometry, like all areas of math, can be found in our everyday lives. Geometry is all around us! Pose the question: where can you find geometry in the real world? Provide groups of 2-4 students scratch paper and allow them to brainstorm as many examples of geometry in the real world as possible during a 2-minute period.  After students collaborate to brainstorm real-world examples of geometry, have students share them aloud with the class. Once you’ve piqued students’ interest in geometry in the real world, explain that today students will have an opportunity to define, classify, and identify additional real-world examples of specific geometric terms. |
| **Direct Instruction and Modeling**  Approximately 10 minutes | Provide each student with a copy of the Note-Taking Guide (consider using the Cloze version with students who need additional support here). Explain that students will use this guide to help them better understand specific geometric terms. Remind students that note-taking guides can be great organizational tools, but can also be used to help them study for assessments in the future. Each note-taking guide includes a space for the geometric term, its definition, an image of the term, and a real-world example.  Model how to complete 2-3 geometric terms in the note-taking guide, having students take notes as you model. Feel free to choose any geometric term from the guide, but consider modeling the following:   * Plane – a flat surface that has two dimensions, length and width * Point – an exact position on a plane; no length, width, or height * Line – a set of points that extends forever at both ends   As you model, place emphasis on the importance of drawing an image that will help students remember the geometric term itself. Use labels to make your images more detailed.  After modeling 2-3 examples for students, transition to the Application Activity portion of this lesson plan where students will complete the remainder of their note-taking guide. |
| **Application Activity**  Approximately 25-30 minutes | Consider employing the differentiation strategy of choice during this portion of the lesson: students can choose to work independently or in groups of up to 4 to complete the remainder of their note-taking guide. Encourage students to use the Geometry text as well as their background knowledge or other classroom resources to complete the note-taking guide. Consider allowing students to move around the classroom or learning environment, especially as they search for real-world examples to add to their note-taking guide.  Provide students time to work and either circulate the classroom or pull a small group for support.  After students have finished their note-taking guides, bring them back to the whole group setting to review any challenging vocabulary terms. For example, specific types of triangles or quadrilaterals, or the difference between regular and irregular polygons. In addition, highlight any creative real-world examples students found as they worked. |
| **Independent Application and Demonstration of Learning**  Approximately 15-20 minutes | Transition to the independent work setting where students will demonstrate their understanding of geometric terms by completing a leveled assignment. Option A requires the least cognitive demand whereas Option D requires the highest cognitive demand. Consider allowing students, especially those who need additional support, to use their note-taking guides as they complete this independent activity.  Option A – Different Looks and Gym Floor Geometry  Option B – Keeping Busy and Signs from the Crowd  Option C – Show and Tell and A Plane Mess  Option D – Unique Spaces and/or Missing Sails  As students work independently, consider circulating the room to provide support, or pulling students using Option D to provide scaffolding as they approach the challenging and complex problems. |
| **Closure**  Approximately 5-10 minutes | Bring students back to the whole group setting and use the following prompts (or your own!) to facilitate a reflective discussion:   * Which geometric terms are easiest for you? Why might this be? * Which geometric terms are trickiest for you? Why might this be? * What strategy did you use when you needed to determine a figure based on its attributes? How do your strategies relate to those of your peers?   Review the objectives by explaining that students were able to define geometric terms in their own words, find real-world examples of geometry, and complete an independent assignment asking them to classify geometric figures. Consider allowing students to keep their note-taking guides for future use and review before closing the lesson. |

**Next Steps and Reflection:**

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| What went well? |  |
| What changes might be beneficial? |  |
| Reteaching needs |  |
| Extension needs |  |

**Vocabulary Definitions:**

* **Plane** – a flat surface that has two dimensions: length and width; a plane goes on forever
* **Point** – an exact position on a plane; no length, width, or height
* **Line** – a set of points that extends forever at both ends
* **Ray** – a section of a line with a starting point but no ending point (extends to infinity)
* **Endpoint** – a point that marks the end of a ray or one of the ends of a line segment
* **Line** **segment** – the part of a line that is between two endpoints; the shortest distance between two points
* **Angle** – forms from two line segments or rays that share a common endpoint
* **Vertex** – the shared common endpoint in an angle
* **Right angle** – an angle that measures exactly 90 degrees
* **Acute angle** – an angle that measures less than 90 degrees
* **Obtuse angle** – an angle that measures between 90 degrees and 180 degrees
* **Straight angle** – an angle that measures exactly 180 degrees
* **Parallel lines** – lines in the same plane that never intersect (or cross)
* **Perpendicular lines** – lines that intersect (or cross) to form right angles (90 degrees)
* **Right triangle** – a triangle in which one angle is a right angle that measures 90 degrees
* **Acute triangle** – a triangle in which all three angles measure less than 90 degrees
* **Obtuse triangle** – a triangle in which one angle is an obtuse angle that measures more than 90 degrees
* **Scalene triangle** – a triangle in which all three sides and all three angles are different
* **Isosceles triangle** – a triangle in which two sides have the same length, and opposite angles have equal measures
* **Equilateral triangle** – a triangle in which all sides have the same length and each angle measures 60 degrees
* **Quadrilateral** – a two-dimensional figure with four sides and four interior angles
* **Square** – a quadrilateral in which all four sides have equal length and there are four right angles
* **Rhombus** – a quadrilateral in which all four sides have equal length
* **Rectangle** – a quadrilateral in which all four angles are right
* **Parallelogram** – a quadrilateral in which opposite sides are parallel and equal in length
* **Trapezoid** – a quadrilateral in which only one pair of sides is parallel
* **Polygon** – a two-dimensional figure with three or more straight sides; contains the same number of angles as sides
* **Regular polygon** – a polygon in which all sides have the same length, and all interior angles have the same measure
* **Irregular polygon** – a polygon in which the sides have different lengths, and the interior angles have different measures