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Lesson Plan created in Collaboration with Esther Antonetti and Samia Amin

Subject/Lesson Title: Two-Dimensional Shapes		**Grade Level:** Second Grade
Central Focus	The central focus of this lesson is to practice identifying the attributes of two-dimensional shapes. In math activities such as “What's in the box?” and “What’s my Rule?”, students will be able to analyze, interpret and classify the characteristics of two-dimensional shapes. Through questioning and investigating they will build on their logic, reasoning, and interpretation skills. Students will practice the identification of two-dimensional shapes without their names and instead will focus on the attributes such as the number of sides and vertices it has.	
Lesson Topic	Identification and Classification of Two-Dimensional Shapes ● Triangle, rectangle, circle, square, quadrilateral, pentagon, hexagon, octagon, and cube.	
New York Common Core/Next Gen. Stand.	**NY-2.G.1** Classify two-dimensional figures as polygons or non-polygons. **2.G.1** Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. Note: Sizes are compared directly or visually, not compared by measuring	
Learning Objective	Students will build on their knowledge of two-dimensional shapes by focusing on the shape attributes rather than the names of the shape. ● Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes. ● Quadrilateral shapes: square, rectangle, rhombus, trapezium, parallelogram, and kite.	

Prior Knowledge*	● Names of the shapes (despite our lack of using it in this lesson). *Ex: Triangle, rectangle, circle, square, quadrilateral, octagon, and more.* ● What counts as a side of a shape ● Basic Mathematical vocabulary (*please refer to the **"Academic Language"** section*) ● Describe shapes by their attributes. Ex: A square has 4 sides and 4 vertices. Two sides of a right-angled triangle can be equal and then the angle between the 2 sides is 90 degrees.
Academic Language*	● Tier 3: They'll interact with vocabulary words such as hexagon, vertices, quadrilateral, pentagon, and polygon. ● Demonstrating the lesson and then having students work in pairs and groups in the classroom discourse the students will engage in. ○ Tier 2: Vocabulary such as identify, find, count, number, shapes, and sides. ● During the lesson when students are doing group work they'll engage in mathematical terms such as angle, length, width, height, and opposite sides.
Materials	1. Small Paper Bags for "What's in the Bag?" Activity 2. Shape Manipulatives 3. White stripes of copy paper for the exit ticket 4. Whiteboard 5. Markers
Plan of Action	
Mini-lesson/ Launch *(10 – 15 minutes)*	Mini-lesson will consist of a **review** of what the students should already know (i.e. quadrilaterals and triangles; the amount of angles/sides they have; how many equal sides, etc) and a quick demonstration of "What's in the Bag?". **Real-Life Application (5 Minutes):** First, we'll start off by showing images of two different construction tools that we'll be comparing and contrasting. The two different tools will be a hammer and a screwdriver. They will talk about the different characteristics of each of the tools that make them similar and different. This

	comparison will serve as a foundation for what they'll be doing in their group. Starting off with working with everyday tools that they are familiar with can help them navigate into working with shapes and their mathematical terms. The teacher will present photos of a hammer and a screwdriver onto the projector screen. In case the screen or projector is not working, the teacher should prepare printed photos of the hammer and screwdriver. The photos should be able to be seen by ALL students. The teacher will write down the answers of each student on the projector screen OR will write it down on the whiteboard if necessary. The students will be gathered onto the class carpet. They will not have to take notes during the Real-Life Application. They will only be required to participate in the discussion and focus on the concept at hand.
Work Time *(30 – 40 minutes)* *(Expl**ain the learning experience** + r**elate it directly** to the **objective**.)*	**"What's in the Bag?" (***Teacher's demonstration)* The activity is explained in depth in the ***Work Time***. One student will be chosen to choose one of the shapes included in the set of manipulatives. They will take that shape and put it in a paper bag, so it will be hidden from the teacher and the class. The teacher will proceed to ask questions that demonstrate what type of questions the students should ask. The students are meant to analyze and interpret the questions, picking up the math language/literacy. ● For this demonstration, the teacher will have a slip of paper with questions prepared. It will be a list of yes or no questions such as: ○ Does it have 3 sides? Yes or No ○ Does it have 4 sides? Yes or No ○ Are all sides of the shape equal? Yes or No ○ Do the sides of the shape have different angles? Yes or No ● The slip will be handed out to each student so they can check the answer given by their fellow peers. ● Based on the answers to the question, the whole class will try to guess what shape was chosen by their peer.

	<u>What's in the Bag? (30 minutes):</u> **Learning Experience** The students should already have basic knowledge of quadrilaterals and triangles. They will already have learned how many angles and equal faces quadrilaterals and triangles are made up of. "What's in the Bag?" will build upon this knowledge by adding pentagons and hexagons. Introducing two unfamiliar shapes will allow for productive struggle, increasing what they know and reinforcing what they already know. The experience will give the students a sense of discovery as they uncover the attributes of a shape. **Learning Goals/Objectives** Students will use logical reasoning to determine a shape from the attributes they discover. They will develop good question-asking skills while learning the attributes of two-dimensional shapes. **<u>What's in the bag?</u>** **Directions:** 1. Students will be placed in groups of 3. (Given our number of students there will be 8 groups of 3 and 1 group of 2) 2. One student in the group will choose a shape from their set of shape manipulatives (types of shapes that will be given to them are shown in the appendix) given to each student. 3. Once the student has chosen a shape, the other two members of the group will ask them questions such as a. Does it have 3 sides? b. Are all the sides equal? 4. Each question will reveal what attributes the shape does and does not have. 5. When the students feel that they have uncovered enough attributes to make a guess, they will state what shape they think it is. a. If it is correct, they will write on the "What's in the Bag?" worksheet, the shape they discovered along with the attributes it has. b. If it is wrong, they will continue to ask questions. 6. Each group will do at least 3 shapes (each member of the group will have a chance to be the one who chooses a shape)

	This activity allows for misconceptions to be resolved through discussion between the students. For example, if the student got one of the attributes for a shape wrong (i.e. they chose a square and said that all the sides are ***not*** equal) their group members will have a chance to explain why it is wrong. **What's my rule? (10 minutes)** - Pair work **Directions**: - One student chooses a way to classify the blocks/shaped (ex: based on color) and starts categorizing the blocks in that trait and the other student can say "STOP" at any time and guess the rule. If it's wrong then the first students continue to add more and more blocks with their chosen attribution. **<u>Learning Experience Objectives:</u>** ● Participants will focus on more than one attribute at a time and use logical reasoning to determine how the set of attribute blocks was sorted. ● Questioning and trying to understand another participant will encourage them to look for the different ways we can categorize shapes. ● Questioning allows them to learn about them and confront their misconceptions, getting feedback from not only the teacher and also their peers. The teacher will be monitoring each group throughout the activity to give guidance. ● A great way for students to learn from each other and self-reflect *Note*: To make the "What's my rule" more challenging, two different rules can be used in the same game/ turn. Also, written instructions will be given to every group during the activity.
● **Share and Conclude** ● *(5 – 10 minutes)*	Exit ticket/ Reflection - Groups will share their findings and even the new rules that they came up with during the activity. Their conversations should be math talk and use their new vocabulary to express their new attributes and findings. - Any new attributions will be added to the original chart.

Accessibilities for Diverse Learners	
EX: Pertinent IEP Goals, Emergent Bilingual Learners, Struggling Learners, Enrichment etc.	Inclusive practices; Grouping students with special IEP needs with general education students. This allows them to work together with their peers and builds on their socializing skills and team working skills. Their ideas will bounce off of each other without the guidance of the teacher helping the child independently think and give ideas to the group. Written instructions for the activities serve as a helpful tool for all the students. This addresses different learning styles. There will also be translations of written instructions in different languages for English Language Learners. The instructions for each game will be placed in each group where the students can read together. If there is a co-teacher present (Special Education or General Education) they will give more individualized attention to struggling learners. The co-teacher can lead a group in the classroom and guide the conversation and clear up any misconceptions they might have. There will be a sheet of shapes and their names so the students can easily know what the shapes are and just name the attributes.
Assessment	
Formative Assessment	1. Exit Ticket 2. Class Discussions 3. Observations of student collaboration

References:

Van De Walle, John A., and Jennifer M Bay-Williams. “Chapter 19: Developing GEometric Thinking and Geometric Concepts.” *Elementary and Middle School Mathematics Teaching Developmentally*, edited by Karen S Karp, 10th ed., Pearson, 2018, pp. 504–505.

Van De Walle, John A., and Jennifer M Bay-Williams. “Chapter 19: Developing GEometric Thinking and Geometric Concepts.” *Elementary and Middle School Mathematics Teaching Developmentally*, edited by Karen S Karp, 10th ed., Pearson, 2018, pp. 508–509.

Zager, Tracy. *Becoming the Maths Teacher You Wish You'd Had: Ideas and Strategies from Vibrant Classrooms*, Hawker Brownlow Education, Moorabbin, Vic., 2017, pp. 49–50.

"2-D Shapes." *2-D Shapes | Lesson Plan | Education.com*, Education.com, 2007 - 2021, https://www.education.com/lesson-plan/2-d-shapes/. Accessed 30 April 2022.

Worksheet for lesson segment:
https://www.teacherspayteachers.com/Download/Second-Grade-Math-Assessments-2-G-1-2-G-2-2-G-3-FREEBIE--321519

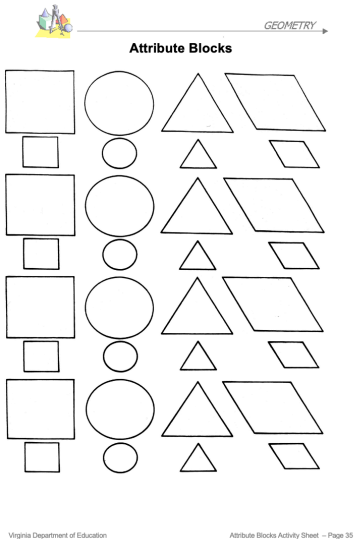
Appendix:

EXIT TICKET/REFLECTION

Name: _____ Date: _____

Exit Ticket/Reflection-
Write 1-5 sentences about something new you learned. Why did you find this new concept interesting? Was it easy or a little bit challenging?

WHEN COMPLETE SHARE YOUR ANSWER WITH A PARTNER NEXT TO YOU



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