**What is Math?**

|  |
| --- |
| **This is lesson one in a series of six lessons focused around developing a mathematical community at the beginning of the school year. While this lesson meets standard NC.K.G.1, its primary goal is for students to start noticing math in the world. A secondary goal is to begin establishing norms for math class.** |

**NC Mathematics Standards:**

**Identify and describe shapes.**

**NC.K.G.1** Describe objects in the environment using names of shapes, ~~and describe the relative positions of objects using positional terms.~~

**Standards for Mathematical Practice:**

2. Reason abstractly and quantitatively.

4. Model with mathematics.

**Student Outcomes:**

* I can find math in my classroom.
* I can use names of shapes to describe objects in my classroom.

**Math Language:**

* Math
* Triangle
* Circle
* Rectangle
* Corner
* Side
* Curved
* Round

**Materials:**

* Access to internet
* Speakers
* Image of a circle
* Image of a rectangle
* *Shapes in My Space* recording sheet

**Advance Preparation**:

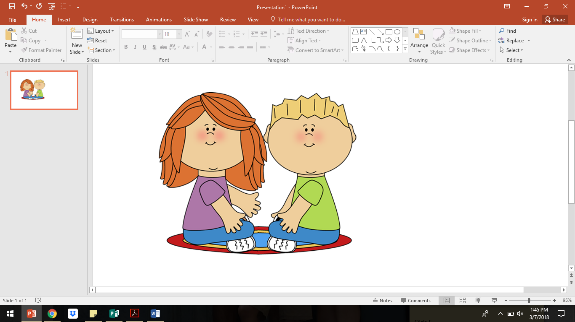
* Prior to lesson, preview [Sesame Street: Tyler Perry & Elmo Eat a Plate of Math](https://www.youtube.com/watch?v=i9jKFqnd1sE) video.
* Copy class set of *Shapes in My Space* recording sheet.
* Print a one copy of the circle and rectangle.

**Launch:\***

1. Introduce the word ***math***.

* Say: *Learning about math is super important because it is all around us. During our daily math time, we will learn about math in our world, like shapes and numbers.*

\*[Click](https://www.youtube.com/watch?v=mEj-i1mgCtg&t=7s&disable_polymer=true) to see video of a teacher launching this task.

* Watch [Sesame Street: Tyler Perry and Elmo Eat Math](https://www.youtube.com/watch?v=i9jKFqnd1sE). Have students look for the things Tyler does or says about math during the video.

**knees to knees**

* After the video, say: *Tyler does lots of math. Let’s talk to our partners about the things he did. When we talk to partners, we sit “knees to knees”*. *Then, we decide who shares first. I say something, then my partner says something. We keep taking turns until the teacher gives a signal* (teacher models with a student).

***Math is…***

* Counting
* Shapes
* Measuring
* Sorting
* Subtraction

**Sample Chart:**

Only record

items students

share.

* Partners discuss the math Tyler does in the video. Then, several students share with the whole class. As students share, generate a ***“Math is…”*** chart (see right). This chart may be displayed and added to throughout the school year.

1. Explain today’s task.
   * Say: *Just like Tyler, we are going to find math in our world. Tyler noticed that his chips looked like triangles. Today, I challenge you to find items in our classroom that look like circles and rectangles.*
   * Show a picture of a circle. Show a picture of a rectangle, rotating it in different directions so students see this is a rectangle regardless of orientation. Post both shapes on the board. At this point, no additional descriptions of the shapes will be provided. Properties of these shapes will emerge during the “Discuss” part of this lesson.
   * Once students find objects shaped like a circles and rectangles, they will record pictures on their *Shapes in My Space* recording sheets.

**Explore:**

1. Allow 5-10 minutes for students to find and record objects that look like circles and rectangles. This exploration time is useful for observing and collecting formative data on students’ current level of understanding. If students are productively grappling, walk around asking questions to elicit thinking (see chart). If the class shows unproductive frustration, pull students back together. Redirect the entire class by asking questions to elicit thinking.

|  |  |
| --- | --- |
| **Observation** | **Questions to Ask\***  \*[Click](https://youtu.be/AqPpS0Vb8OI) to see video of a teacher asking questions as students explore task. |
| Student walks around room, not attempting to find objects. | Student may be overwhelmed by the multiple parts of the task or overstimulated by the number of objects in the classroom. Ask:   * Can you start in this corner of the room? * Do you see a circle (rectangle) on this wall? |
| Student incorrectly identifies shapes, or appears unable to recognize shapes in the environment. | Student may not be familiar with terms *circle* and *rectangle*. Ask:   * Look at the circle (rectangle) on the board. Can you make a circle (rectangle) in the air with your finger? * Can you find the circle (rectangle) on our classroom shape chart? * What other objects look like this circle (rectangle)? |
| Student quickly finds examples of circles and rectangle. | * How do you know this is a circle (rectangle)? * How do you know it is not a rectangle (circle)? * Can you think of objects in your house that are shaped like a circle (rectangle)? |

* As students work, select a few to share their shapes during the “Discuss” section of the lesson. Determine sequence in which students will share (e.g., justifications for knowing shapes progress from least to most sophisticated).

**Discuss:**

1. Bring students together on the carpet (leave papers at tables/desks).
   * Remind students that there is math everywhere in our world. Today, we found shapes in our world, and shapes are math.
   * Partners turn “knees to knees” and tell about the shapes they found.
2. Have pre-selected students to share the shapes they found.
   * As each students shares, direct attention to the objects referenced.
   * Ask questions to elicit thinking, drawing attention to properties of the shapes.

|  |  |
| --- | --- |
| **Sample Questions** | **Possible Responses**  **(in order of least to most sophisticated)** |
| * How did you know that was a circle? * What the same about of our circles? | * It looks like the sun. * It’s curvy like this (shows with finger). * It’s round. * It doesn’t have sides or corners. |
| * How did you know that was a rectangle? * What’s the same about all of our rectangles? | * It looks like a door. * It’s bumpy * It looks like this (draws rectangle in air with finger). * It has four sides and four corners. |

* + As students observe each object, encourage them to trace it in the air using their fingers. After students have traced several circles and rectangles, discuss the differences between the two shapes.

1. Say: *Math is everywhere in our world. Today, we found math our classroom by looking for shapes. Today and every day, we will keep talking about math, looking for math in our world, and using math to solve problems.*

**Evaluation of Student Understanding:**

**Informal Evaluation:**

* When shown a picture of a circle (or rectangle), students will be able to find an object that looks similar. The student should be able to label that object as a circle (or rectangle).
* Students will find math in the classroom (e.g., shapes or numbers).

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

**Interventions:**

* As this was an introductory lesson, it is not expected that students have prior knowledge of shapes. Continue to provide all students with experiences noticing, describing, manipulating, classifying, and sorting shapes across the school year.

**Extensions:**

* Throughout the school day, find opportunities to point out math in the world, paying particular attention to shapes in our world. Do additional shape hunts in other locations around the school, and challenge students to find shapes at home.
* Encourage students to use positional words to describe the locations of shapes found around the school.
* Play “I spy” while looking for shapes around the classroom.

**Possible Misconceptions/Suggestions:**

|  |  |
| --- | --- |
| **Possible Errors**  **and Misconceptions** | **Suggestions** |
| Student recognizes shapes in the classroom, but is unable to describe identify specific attributes. | At this point of the school year, most students are at the visualization level of geometric thought. This means that they recognize a shape based on something it looks like, without attending to its properties (i.e., that’s a circle because it looks like the sun). By highlighting features that all rectangles have and all circles have, students begin to recognize the defining attributes. With additional sorting, classifying, and hands-on experiences, students will focus more on the shapes’ defining attributes. |
| When asked about the properties of a shape, student lists non-defining attributes (e.g., big, red). | As this was an introductory lesson, students are not expected to know the defining attributes of a circle and rectangle. Rather, they should start by noticing things in the environment that look similar to the displayed pictures of the circle and rectangle. As students see several different circles and several different rectangles, they will begin to notice attributes that all circles have and all rectangles have. |

**Special Notes:**

* This was an introductory lesson, with the intended goal of noticing math in our world. Therefore, students should not be held accountable for knowing shapes and their properties. By the end of the school year, after having many experiences with shapes, students will recognize a given shape regardless of its orientation and know its defining attributes (properties).
* In the video [Sesame Street: Tyler Perry and Elmo Eat Math](https://www.youtube.com/watch?v=i9jKFqnd1sE), Elmo thinks the plate is a rectangle because of its two long sides and two short sides.  While Elmo's statement does not match the formal definition of a rectangle, it is a typical beginning-of-kindergarten response.  Through experiences with shapes, Elmo, and Kindergartners, will begin to recognize that a rectangle is any four-sided shape with four right angles (like the corners of a piece of paper).

