



Angles - Angles, Angles Everywhere

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Grade Level: 2

Duration: 1 Hour

Overview:

Students will strengthen their understanding of angles. Students will realize that angles are all around them. Students will strengthen their understanding of angles needed for developing a foundation for understanding trigonometry and calculus in later grades.

Standards Addressed:

Domain: Geometry

Reason with shapes and their attributes

Mathematical Practices:

- Make sense of problems and

CCSS.Math.Content.2.G.A.1

Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.¹ Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

persevere in solving them

- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Use appropriate tools strategically
- Attend to precisions
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

Essential Question:

What is an angle?

Objectives:

Demonstrate understanding of angles

Students will strengthen their understanding Students will investigate, describe and analyze angles. Students will name and identify right, acute and obtuse angles. Students will develop a foundation for understanding angles that will be needed in later grades.

Materials:

- ✓ Book: The Greedy Triangle
- ✓ Right Angle Detector (made from paper or transparency)
- ✓ Documenting Worksheet
- ✓ Clipboard & pencil

Vocabulary

- angle

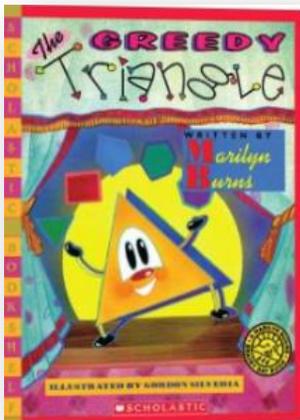
Connection:

What is an angle?

Set the Purpose:

Today we are going to be learning about angles and how they are all around us. First let's read how angles relate to polygons.

Opener:



Read The Greedy Triangle written by by Marilyn Burns and Gordon Silveria to the class. This book is about polygons. The story follows a bored triangle who wishes to add excitement it's life more exciting by adding angles to it shape.

Model:

Think about what you already know about attributes of polygons. We have already learned how polygons have sides and vertices but in today's story we learned that polygons have angles. Let's look at the word triangle for a moment. Draw a triangle on the board and write the word "triangle" under it. Underline "tri" and then underline "angle". *The word triangle means "three angles". A triangle has 3 angles.* Create a table on the board comparing shapes to angles. *A polygon with 4 angles is a quadrilateral.* Continue filling out the table until you are satisfied that students understand the relationship. *What exactly is an angle? Let's look back at the triangle on the board. I am going to name this side of the triangle yellow, this one red and this one blue. You can see that the yellow and red sides form this angle.* Circle the angle. *The red and blue sides form this angle.* Circle the angle. *Lastly the blue and yellow sides form this angle.* Circle the angle. *What is an angle? Using what you know about angles, turn and tell you neighbor what an angle is.* Walk around and monitor for understanding and allow students to share their ideas with the rest of the class. *It sounds like we have come up with pretty good definitions and descriptors of angles. We know that when two sides or lines meet they form an angle. Let's take a closer look at angles.* Draw three angles on the board (obtuse, right and acute). *We have 3 types of angles*

that we are going to identify today: obtuse, right and acute. Let's start with the right angle. This angle can look like this. Draw right angles going in all different direction. You can see that the angle (where the two lines meet) all form the same angle, it's like an L shape, or backwards L or upside L or backwards-upside down L. Use your body to make a right angle. Now not all angles are right angles. Some are bigger. Draw several obtuse angles on the board. These angles are larger than a right angle and we call them obtuse angles. Use your body to make an obtuse angle. There are also angles that are smaller than a right angle and we call those acute angles. Draw several acute angles on the board. Make an acute angle with your body.

Guided Practice:

We know that polygons have angles but if you look at objects in the classroom you will see that they have angles. Let's look at this book. I can open it and form different angles. How about your desk. Can you open your desk and form a right angle? How about an obtuse angle? Why do you think the desk designer didn't want your desk to open to an obtuse angle? Give students time to think, discuss and share thoughts. Angles have a large impact on

how objects work. Angles of objects are often a particular way or length for a reason.

Let's find another angle in the classroom and identify it together.

Locate an angle in the classroom that is easily visible to everyone.

Try and find an obtuse or acute angle that is close to 90 degrees.

Let's take a look at this angle. This time I am going to use this

simple right angle detector. Place the right angle detector on the

angle. *What do you think? What kind of angle is it?* Allow students

to think, discuss and share. *Now let's look at this angle.* Find an

angle that is clearly obtuse or acute. *Think about what you know*

about angles. Think about what you know about the different

types of angles. Can we identify this angle without using our right

angle detector? Allow students to think about questions you have

just asked. *Turn and tell your neighbor what type of angle it is.*

Way to use your brains. If I needed to I could use my right angle

detector but you will find that the more angles you identify the

less you will need your detector. It's now your turn to start

finding and identifying angle. Just like the world around us, our

classroom is full of angles but today we are going outside on the

playground to find angles.

Independent Practice:

You are going to work independently or with a partner and locate angles. Once you find an angle you need to identify what type of angle it is. You are then are going to document the angle on your worksheet by putting a check in the appropriate column. Make sure you find a new angle each time. Don't forget to use the right angle detectors when needed. What type of angle do you think you will identify and document the most? Allow students to think, discuss and share their guess.

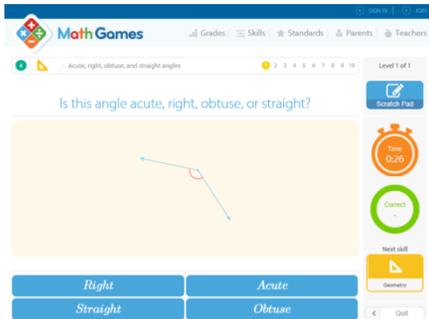
Assessment:

Students will be assessed on their ability to successfully locate and identify angles (right, obtuse, and acute). Teacher will be walking around playground monitoring and answering questions, and viewing student's work. Teacher will be checking for understanding by listening and probing to see if there are any concerns, misinterpretations or questions while the students are locating and identifying angles.

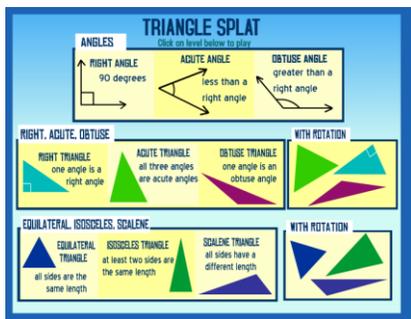
Closure:

Once students have had sufficient time to locate and identify angles, bring the students back into the room and have them total their angles. Discuss with the class the results.

Technology Connection:



Students can test their knowledge with Math Games "Acute, Right, Obtuse and Straight Angles". <http://www.mathgames.com/skill/4.1-acute-right-obtuse-and-straight-angles>



Students who are up for an added challenge can play Triangle Splat.

http://www.sheppardsoftware.com/mathgame/geometry/shapeshoot/triangles_shoot.htm

Continuation:

Objects in nature also have angles. Repeat the angle identification activity and worksheet in the woods adjacent to the playground. Compare results.

Samples & References:

Right Angle Detector I made out of transparency paper

