Basic Geometry Ideas and Angle Measurement

Summary

Students will describe and identify basic geometry ideas including line segments, rays, lines, parallel lines, perpendicular lines, and midpoint. Students will describe attribute of angles and measure angles.

Main Core Tie

Mathematics Grade 4

Strand: MEASUREMENT AND DATA (4.MD) Standard 4.MD.6

Additional Core Ties

Mathematics Grade 4

Strand: MEASUREMENT AND DATA (4.MD) Standard 4.MD.5

Mathematics Grade 4

Strand: GEOMETRY (4.G.) Standard 4.G.1

Materials

- Angle Sort paper
  Worksheets: Geometry Words Journal Page, Measuring Angles worksheets
- Measuring angles quiz
- Classifying Angles song overhead
  Scissors, Paper for foldable, Protractors
  Two-Colored Circular manipulative (made with small plastic plates)

Background for Teachers

Enduring Understanding (Big Ideas):
Geometric ideas can be identified and described.
Essential Questions:

Where are examples of lines, segments and rays, parallel and perpendicular lines and midpoints found in the real-world?
How does a midpoint compare to other points on a line segment?
What units of measurement are appropriate for measuring angles? When is an angle considered to be a right angle? An acute angle? An obtuse angle?

Skill Focus:
Identify and classify geometric figures using information about their characteristics
Vocabulary Focus:
Point, line, line segment, ray, parallel lines, perpendicular lines, intersecting lines, midpoint, angle, vertex, degree, protractor, acute, right, obtuse, congruent
Ways to Gain/Maintain Attention (Primacy):
contest, sorting, measuring, cooperative learning, manipulative, music, movement, virtual manipulatives-Geoboard

Instructional Procedures

Post all vocabulary using a mind map to help students connect the words to their meaning.
Starter: How great is your memory from your past experiences Contest? Try to match each word to the correct picture.

Lesson Segment 1: Where are examples of lines, segments and rays, parallel and perpendicular lines and midpoints found in the real-world? How does midpoint differ from other points on a line?
This can be a contest where small groups compete to see how many they can name. As you discuss the starter with the students, have them begin to fill in the Geometry Words journal page (attached). Assign each team of students one idea from the starter except "angle" to consider three real-world examples or situations. Select one person from each team to share the examples, so the class can choose one of those to write on their journal page. As you discuss the ideas, have students fill in their own words and sketches.
Lesson Segment 2: Where are examples of angles found or used in the realworld?
Guessing game: Tell students you are thinking of one of the geometric ideas and that you will point to some examples of that idea in the room. When they think they might know what the idea you are thinking of is, they may write the idea down. After pointing to several examples that suggest where an angle might be formed, ask for responses. Ask students to describe attributes for some of the angles you pointed to such as where the vertex point might be, or where the line segments are which form the angle. Show the math symbol for angle.
Lesson Segment 3: How can I describe attributes of angles?
Without giving information have students sort angles by cutting out the cards on the Angle Sort paper. Partners cut and sort, writing the rule for their sort. Then have the partners compare their sorting to another pair. Discuss with class the sort bringing them to the idea that angles can be described by the wideness or openness of the angle. This wideness is the measure of an angle. Remind them that they may have heard words such as acute, right or obtuse when describing angles.
Sing this song with the students:
Classifying Angles Song
(to the tune of Skip To My Lou. Lyrics by Linda Bolin)
Use arms to show each as the verse is sung.
I'm a little angle. I like me like that.
An ACUTE little angle, and I'm not fat.
I'm an alligators mouth or a witches hat.
I'm ACUTE. I'm less than 90.
'm a RIGHT angle, and I look square.
Look for a corner, and I'll be there.
I'm a flag or a present. I'm everywhere.
I'm just RIGHT. I'm exactly 90.
I'm rather large, so I have pride.
I'm an OBTUSE angle. I'm big inside.
I'm a reclining chair or a door open wide.
I'm OBTUSE. I am more than 90.
Have students use Two-color Circular manipulative to show attributes such as acute, obtuse and right as you ask them to. (A two-color manipulative can easily be made to allow the students to demonstrate angles. Make a cut in two different colored small plastic plates from the circumference to the center of the plate. Slide the two plates together at the cut.)
As they play with the two-color manipulative, get students to notice that an angle is a turn. When the turn is less than 90, the angle is acute. You can have students act this out. Have a student put one hand on a chair and rotate around it. Have the class guess if the rotation was an acute, obtuse or right angle. If the subject comes up, let students know that angles that are 180 or more hae different names and we will learn those at a later time.
Have students re-sort the angles into acute, right and obtuse categories (if they did not originally do so) and write the category on the back of the card.
Lesson Segment 4: What is the measure for a given angle?

Use the "Measuring Angles" investigation worksheet and protractors to become more familiar with the protractor and to measure angles.
Practice:
Make a three column foldable (as shown below). The back side of the foldable can be labeled "Measuring and Classifying Angles". Have students use their protractors to measure each of the angles from the sort cards. Then have them use the protractor to sketch the angles in the appropriate column on the Foldable and label the measure of each angle.
Using the Two-Color Circular manipulative again, call out angle degrees and have the students rotate the sections of their plate to show an estimate for the measure.
Students will enjoy practicing angles measures using a virtual protractor by going to this site:
http://www.kidport.com/Grade6/Math/MeasureGeo/MeasuringAngles.htm
Assessment: Have students complete the quiz attached

Assessment Plan

performance task, assignments, observation, questions, quiz

Bibliography

This lesson plan was created by Linda Bolin.

Authors

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