MEASUREMENT OF ANGLES

Subject

Mathematics

Prepared By

[Instructor Name]

Grade Level

5

Overview

This lesson plan covers teaching content for;

1. Types of angles
2. Related group of angles
3. Measuring angles with a protractor.

Objectives

Students should be able to;

1. Understand the definition of various angles
2. Explore the relationships between these types of angles.
3. Measure angles with a protractor and estimate angle measures as greater than or less than 90°.

Activity Starter/Instruction

1. An angle is formed when two rays share the same endpoint.
2. The point where the rays intersect is called the "vertex" of the angle.
3. The two rays are called the sides of the angle. Angles are measured in degrees.
4. There are three types of angles:
- Acute angle: An angle whose measure is less than 90 degrees.
- Obtuse angle: An angle whose measure is greater than 90 degree.
- Right angle: An angle of 90 degrees.
5. Group of angles or pairs of angles can be related in the following ways:
- Adjacent angles: Two angles that share a ray, thereby being directly next to each other.
- Alternate exterior angles: Angles locates outside a set of parallel lines and on opposite sides of the transversal.
- Alternate interior angles: Angles located inside a set of parallel lines and on opposite sides of the transversal.

Teacher Guide

Day 1/ Lesson 1: 20mins

1. Have student look around the class to identify examples of angles, perpendicular and parallel lines, rectangles and triangles. For example, the hands on the clock, legs on a chair, grout lines around tiles, door frames, picture frames, etc.
2. Have them write down all the examples on paper. Then use a ruler (or tape measure) and/or compass to measure and record the lengths and angles of the objects.
3. To give your students further practice measuring, identifying, and drawing these key terms, have them draw an array of angles, perpendicular and parallel lines, rectangles and triangles in an artistic design on a large sheet of paper using the proper tools.
4. Encourage them to let the lines, rays and figures overlap in various parts, as well as to orient the figures at different angles—think of this in terms of creating modern art!
5. Then have them use different colored markers to color in all enclosed figures. For example, if a pair of parallel lines overlaps a rectangle, then there would be three separate enclosed figures to color in.
6. Display their work of art for all to see!

Materials Required

- Ruler
- Tape measure
- Compass
- Pencil
- Paper
- Markers
- Colored tapes
- Mini White Board
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Additional Resources

- https://www.teachstarter.com/au/blog/20-fun-angles-resources/
- http://www.mrmaffesoli.com/printables/4MD6-TPT1.
- http://www.math-aids.com/Geometry/Angles/
- https://www.oercommons.org/courseware/lesson/33
- https://mathgeekmama.com/measuring-angles-activit
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Additional Notes

Guided Practice

Day 2/ Lesson 2: 15mins

1. This is a quick activity you can do at various points throughout the day while they are studying angles.
2. At any given time, ask the students what time it is on an analog clock (that is good practice just in itself).
3. Record the time and ask the students what kind of angle it is - acute, right, obtuse or straight.
4. Also ask them to estimate the size of the angle.
5. When doing this, the students will realize that each 5 minute interval is 30 degrees - so helpful for estimating.
6. Just keep a running record on the board by the clock and try to get in at least 5 questions throughout the day.

- Corresponding angles: Two angles in the same relative position on two lines when those lines are cut by a transversal.
- Same side exterior angles: Angles located outside a set of parallel lines and on the same side of a transversal.
- Same side interior angles: Angles located inside a set of parallel lines and on the same side of a transversal.
- Vertical angles: The two non-adjacent angles formed when two straight lines intersect.
- Supplementary angles: Two angles whose measures have a sum of 180⁰.
- Complimentary angles: Two angles whose measures have a sum of 90⁰.
6. Perpendicular lines are two lines that intersect at the right angle.
7. Parallel lines are lines that are always the same distance apart and will never meet.

Guided Practice

Day 3/ Lesson 3: 20mins

1. Get the tape out and get ready for some hands-on fun!
2. Tape up a table, arm students with a whiteboard marker, and let them classify (acute, right, obtuse, and straight) as many angles as they could.
3. So everyone can fit around the table, pair up the students so they could take turns marking angles on the table.
4. Then you can move on to measuring angles.
5. Just use some fun colored tape to "draw" lines on whiteboards.
6. You can use 5 pieces of tape - and tell them the tape had to be straight and go across the board from one side to the other.
7. From there, students measured the angles made by the tape.
8. You could just leave it at this, or turn this activity into a game by pairing up the students.
9. Each student had a different color of whiteboard marker. The first student will measure an angle (any angle of their choice) and write down the measurement using their color.
10. Then, the second student checks the answer. If it is correct, they leave it alone. If it is incorrect, they will erase the first answer and write the correct answer using their color (the second student).
11. The second student then get a chance to pick and measure an angle of their choice - recording the answer in their color.
12. At the end of the activity, the student with the most answers in their color (most correct answers) wins!

Summary

1. Discuss with students how they went about answering questions and how they knew when they were correct.
2. Once the students have been allowed to share what they found, summarize the results of the lesson.

Assessment Activity

1. Ask students to identify at least 3 real world examples of some of the angles.
2. This will make the learning more relevant and give them a resource to refer to, to solidify their knowledge.

Assessment Activity

Assess if students can;

1.Identify different angles.

2.Explain the relationship between two angles.

3.Measure angles correctly.