



NCEA Math Lesson Plan

Grade: 4

Subject: Mathematics

<p>Domain: Geometry</p>
<p>Standard Number(s) and Description: 4 G.1 Draw points, lines, line segments, rays, angles (right, obtuse, acute), and perpendicular and parallel lines. Identify these in two-dimensional figures.</p> <p>4 G.2 Classify two-dimensional figures based upon the presence of or absence of parallel and perpendicular lines, or the presence or absence of angles of a specified size.</p>
<p>Vocabulary to be Highlighted: Line segment, ray, right angle, obtuse angle, acute angle, straight angle</p> <p>Extension vocabulary: supplemental and complimentary angles</p>
<p>Mathematical Practices (#): 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision.</p> <p>Essential Questions: What do you already know? What are you trying to answer? How are angles measured? How are angles classified? Is there a tool that would help you discover? What technology did you use? Was it a good choice? What new math words did you use today? How can you convince me that your answer is correct? What was the big idea? Based on these examples, what conclusions can you draw?</p>
<p>Materials/Tools (include technology): iPads to take photographs (if available) Paper/pencil to draw pictures Protractors Access to a church</p>
<p>Connections to Other Math Domains: 4.NBT,4 In working with complimentary and supplementary angles, students would fluently add and subtract multi-digit whole numbers using the standard algorithm. 4.MD.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and</p>

mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

4.MD.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:

4.MD.5.A An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $1/360$ of a circle is called a "one-degree angle," and can be used to measure angles.

4.MD.5.B An angle that turns through n one-degree angles is said to have an angle measure of n degrees.

4.MD.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

Connections to Other Subject Areas:

Religion- Students analyze angles located in churches.

Social Studies- Examine famous churches in the world using a web quest format. Identify the region of the world (geography). What similarities and differences are noted? Students may look for generalizations in the use of angles in architecture in a specific region or around the world.

Architecture- Examine and analyze different structures within buildings.

Language Arts- Angles are Easy as Pie is a memorable picture book that could be used to present information in an additional manner.

Catholic Identity Component:

Students record and analyze angles located in churches. As cooperative group work is essential in this lesson, students are expected to demonstrate the Beatitudes of "Blessed are the merciful," and "Blessed are the peacemakers," as they respectfully discuss and collaborate to identify and analyze angles in a real world religious setting.

Resources (attachments):

Angles are as Easy as Pie or similar picture book, such as The Adventures of the Angles

Activities/Timeline:

1. Activation: The teacher reads a picture book to the students, such as Angles are as Easy as Pie or The Adventures of the Angles, followed by a brief discussion stating that an angle is formed when two rays share a common endpoint. Angles are classified as right, acute, obtuse, and straight based upon their measurement.

Grouping: Students are divided into groups of three and given an iPad to use for the next activity. (Students should have already used iPads and be very familiar with expectations regarding iPad use.)

2. Students work in groups to locate examples of acute, obtuse, right, and straight angles in the church. Students then take pictures of each angle example using the iPad (or sketch pictures and record location if iPads are not available). Students are expected to work collaboratively during this time to respectfully discuss which structure provides the best example of each angle type to photograph or sketch.

3. Upon completion of this step, students return to the classroom. Groups take turns displaying

their example angle photographs or sketches. The teacher facilitates a discussion regarding the photographs/sketches. Teacher and students should use proper terminology when describing objects/structures in the church (ex: the altar has right angles). Students analyze angles of each type to form generalizations.

4. The teacher asks about how angles could be measured. Why is it important to measure angles? What would happen to the building if the angles had not been carefully measured? Introduce the protractor and allow students to freely explore with the tool. Then, guide the students to measure the angles. What can we generalize about the relative measurements of obtuse, acute, right, and straight angles?

Extension (if time permits): Students are introduced to the concepts of complimentary and supplementary angles.

6. Closure: Ticket out the door on a Post-it as students head out the door- "Name and describe two different types of angles."

Formative Assessment (what to look for, how/when to look):

Observe as students locate and record different types of angles. Do they demonstrate understanding of each angle type?

Are all students participating? Are some not engaged? If so, why?

The photographs/sketches also serve as formative assessment pieces to check for student understanding.

Summative Assessment:

Students work in small groups to design and draw a structure within a church. Students must measure and include angles of specified sizes within their drawings.

As an extension, groups could trade drawings and identify and measure angles in the drawing of another group. Groups may realize that they have included more angles than they originally realized.