



NCEA Math Lesson Plan

Grade: 9-12

Subject: Pre-Calculus

<p>Domain: Geometry</p> <p>Topic: Trigonometry</p>
<p>Standard Number(s) and Description: G.SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.</p> <p>G.SRT.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.</p>
<p>Vocabulary to be Highlighted: Cubit, span, sine, cosine, tangent, SOHCAHTOA, arcsine, arccosine, arctangent, Pythagorean Theorem, similarity</p>
<p>Mathematical Practices (#):</p> <ol style="list-style-type: none">1. Make sense of problems and persevere in solving them.2. Reason abstractly and quantitatively.3. Construct viable arguments and critique the reasoning of others.4. Model with mathematics.6. Attend to precision. <p>Essential Question: How do we use right triangle trigonometry to determine an unknown measure?</p>
<p>Materials/Tools (include technology): Post-it notes PowerPoint with right triangle trigonometry review Pictures of David and Goliath (below) Pencil Paper</p>
<p>Connections to Other Math Domains: Right triangle trigonometry and similar triangles as a review of previous knowledge in order to learn the unit circle.</p>
<p>Connections to Other Subject Areas: Science Physics</p>
<p>Catholic Identity Component: Life and dignity of the human person (bullying, conflict resolution, just war)</p>

Resources (attachments):

The Bible Series-Episode 4-David and Goliath

<https://www.youtube.com/watch?v=PITpu5yHXz8>

1 Samuel 17

Activities/Timeline:

Entry Activity: Display a picture of David and Goliath when students walk into room. Students should write their guess of Goliath's height on Post-it notes and stick them to the whiteboard in descending order. Show the YouTube video of the fight between David and Goliath and have students read selected verses from 1 Samuel 17. Discuss the triangles they see in the image and how they relate David and Goliath's heights.

Lesson Description/Steps: Students will walk in the room and complete the entry activity. After the discussion of David and Goliath, lead the students in a review of trigonometry including trigonometric ratios, inverse trigonometry, angles of elevation/depression, and solving a right triangle. Have the students complete a quick formative assessment on this material. This assessment concludes the first half of the lesson. The second half begins with the same picture from the entry activity and a discussion of triangles in the picture. Give directions to the challenge activity and group the students in pairs by varied learning levels. After the groups finish, lead the students in a whole class discussion of the reasonableness of their answers as well as life and dignity of the human person.

Individual Assignment: Give students a worksheet with five practice problems on setting up trigonometric ratios. Have students work on the David and Goliath problem in pairs. Assign homework if desired.

Modifications/Differentiation:

Visual: Place the image of David and Goliath on the Smartboard/whiteboard with the triangle superimposed. Give every student a handout with the image in case they have trouble seeing the board.

Auditory: Give the link to the YouTube video to all students so they may watch the video at home using their computer, headphones, etc.

Differentiation: During independent practice, assist those students who need additional help. For enrichment, the students will have to produce the sketch of the triangle given a written description. Higher-level learners could find the height of Goliath based on David's cubit.

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

Observe student responses to review, wrap up problems, and collaborative challenge problem. Analyze student responses during the concluding discussion. Conclude the lesson with a formative assessment on the students' ability to set up a trigonometric ratio and solve a right triangle.

Summative Assessment:

A possible summative assessment would include a problem in which students set up a similar triangle from a different scenario such as a church steeple and the priest standing outside. Have the students write a persuasive essay on the topic of life and dignity of the human person corresponding to the discussion at the end of this lesson.

Sample Pictures of David and Goliath

