Jillian Scheschuk
Digital Image Acquisition
Week 2-3 Project: Backwards Design Lesson Plan
Summer II 2016

Stage 1: Desired Results

Established Goals:

- HSG-SRT.C. Define trigonometric ratios and solve problems involving right triangles.
- HSG-SRT.C.6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

Understandings:

Students will understand that…

- Trigonometric ratios can be used to find missing measurements based on various combinations of side lengths and angle measures of right triangles.
- Angles of elevation and depression are acute angles of right triangles formed by horizontal distances and vertical heights.

Essential Questions:

- How are ratio, proportion, and similarity related to trigonometry?
- How can visualization help connect properties of real objects with printed images of these objects?
- How can logical reasoning be applied to develop and apply properties related to geometric relationships?

Students will know…

- The sine, cosine, and tangent ratios.
- The inverses of sine, cosine, and tangent.
- Angles of elevation and depression are acute angles of right triangles formed by horizontal and vertical distances.

Students will be able to…

- Use trig ratios to calculate missing side lengths, angle measures, and area.
- Apply trig ratios and angles of elevation/ depression to solve contextual problems.

Stage 2: Assessment Evidence

Performance Tasks:

- How can we calculate the height of a very tall object (tree, building, etc.) using trigonometry?
- Problem: A 20-foot ladder leans against a house so that its base is 11 feet from the house. If the angle formed with the ground is less than 60°, then it will fall. Based on this information, will the ladder fall?

Other Evidence:

- Unit Assessment (teacher-created)
- Homework exercises: pg. 510 #2-28 evens; pg. 518 #2-24 evens

Stage 3: Learning Plan

Learning Activities:

- Investigation on the basic trigonometric functions and their relationships in right triangles using knowledge of similar triangles and a graphing calculator.
- Discussion: “How do we decide which trigonometric function(s) to use in a given problem?”
- Read sections 8-3 and 8-4 in the textbook for reinforcement.
- Angle of Elevation Project: Determine the height of a tree outside using an inclinometer made from a protractor, string, and small weight.

Textbook source: Charles, R. I. (2012). *Geometry: Common Core*. Boston, MA: Pearson.