



NCEA Math Lesson Plan

Grade: 8

Subject: Mathematics

Domain: Geometry
Standard Number(s) and Description: 8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
Vocabulary to be Highlighted: Pythagorean Theorem
Mathematical Practices (#): 4. Model with mathematics. 7. Look for and make use of structure. Essential Questions: How can you use the Pythagorean Theorem to determine maximum measurement? How do you identify a diagonal in two- and three-dimensional figures? How do you identify a right triangle and the parts of a right triangle? How do you identify a right triangle within a three-dimensional space? What is the measurement of the diagonal of any face of a rectangular prism? How do you find it?
Materials/Tools (include technology): Rulers or tape measures Rectangular prisms – different sizes Calculators Device to get on-line, if possible Camera or sketch pad for at home Geometer’s Sketchpad software
Connections to Other Math Domains:
Connections to Other Subject Areas: There are many ways that we can use the Pythagorean Theorem in mathematics, science, economy, and math-related fields in order to solve problems.
Catholic Identity Component: The number three signifies completion, perfection, unity in God’s creation, and the Trinity. There are four right angles within the cross.
Resources (attachments): Pythagorean Theorem Lesson: available at https://www.brainingcamp.com/content/pythagorean-theorem/lesson.php

Activities/Timeline:

Lesson 1

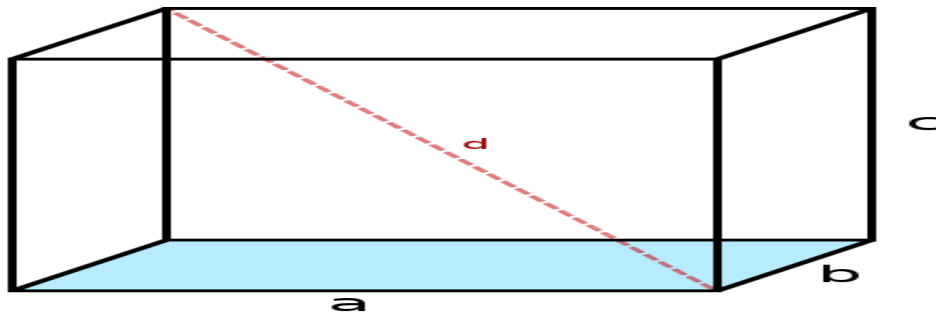
1. On a tour of the campus, including the church, ask students to find five right triangles and identify the legs. Make sure that students do not duplicate triangles – once a triangle is chosen, another group cannot use it.
2. Ask students to sketch the triangles and label the legs only of each triangle. Students should measure or estimate lengths of the legs. Students should indicate where the triangle is located.
3. When back in the classroom, students should trade drawings with another group and find the length of the hypotenuse of the triangles found.

Lesson 2

1. Begin by showing the first 24 slides of the video lesson in the resources section. This introduces the Pythagorean Theorem and the diagonal of a rectangular prism.
2. Give each group a prism and ask them to find the diagonal of each face and the diagonal of the prism. Students should record the information on a spreadsheet.
3. Students should trade prisms with another group and do the same thing, repeat until students have recorded all of the prisms on the spreadsheet.
4. Homework – ask students to find two prisms at home and measure the dimensions and find the diagonals on each face as well as the prism. They should record the information on their spreadsheet and bring to school a picture or sketch of the prism with the dimensions written on it as well as the spreadsheet.

Lesson 3

1. Students will trade pictures with another student in the class and find the diagonals of each side as well as the prism. They will write a description of how they found the answer.
2. Pose the problem: “An artist wants to make a cross for his childhood church. He lives over 200 miles away and will have to ship it in a semi-truck. He will ship it in two pieces, the vertical and horizontal pieces will be separate. He wants to make it as large as will fit into the trailer on the truck. The dimensions of the shipping container are 8’6” high, 8’6” wide and 48’ long. What is the tallest cross that can be made that will fit into the trailer?”

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

Give a problem to the entire class for feedback before they leave for the entire day.

At home, students should find two different rectangular prisms. Students should photograph or sketch the prisms, then measure the dimensions. Finally, students should calculate the diagonals of each side of the prisms and the diagonals of the prisms themselves.

Summative Assessment: