



TEACHER PAGE

Lesson: Scale Factors: Ratios and Proportions (Statue of Liberty)

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New Arizona Math Strand 4 Geometry and Measurement Grades 9-12

Articulated 4MH1-09 Solve scale factor problems using ratios and proportions.

Learning Objectives: The student will be able to:

- solve proportions using the means-extremes property
- set up and solve word problems involving ratios and proportions

Materials:

Map with scale printed on it.

Compass and ruler for the TALK ABOUT IT! construction.

Overview:

This lesson defines the terms Ratio and Proportion, shows various examples of each, and defines and gives examples of the Means-Extremes Property. Use of the property to solve equations is illustrated, and word problems that lead to equations that can be set up as a proportion are shown. The student is then guided through each type of problems, with feedback provided to guide the learning.

Engaging Students:

Students are to be introduced to the concept of scale using a large classroom map or if working with individuals, a small roadmap. Any map with a scale printed on it would work. Ask students to determine how a person uses a map to decide how far apart cities or other destinations are from each other.

Content:

A definition of ratio and proportion are given, along with an algebraic definition of the means-extremes property. Students use the property to solve simple proportions. Applications (word problems) encouraging the use of units are discussed. Students set up proportions from these word problems, and then use the means-extremes property to solve them. A classic Geometry construction of the Golden Rectangle is offered in the TALK ABOUT IT! section.

Follow-up/Extensions;

Students explore the applications of the concept of scale factors/ratios/ proportions using maps, scale drawings of building projects, floor plans, and similarity in polygons, perspective, conversion factors, classic architecture, and gear ratios. These examples are a very small sampling of the types of explorations.

Assessment:

Students demonstrate the ability to solve a given proportion using cross products. Students will also demonstrate their ability to set up a proportion from a word problem using units. The assessments are in SHOW module.

