

Lab Framework

Text:CORD

Unit number and title: Unit 9 – Using Ratios and Proportions

Short Description: This lab will require that students measure the front of the classroom and draw it to scale.

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Date: Summer 2010

Lab Title

Scale Drawings!

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

The objective of this lab is to apply the ideas of proportions and ratios to scale drawings, and to have a discussion with students about the meanings and applications of scale drawings.

- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)

- Students will need to know how to use a measuring tape
- Need an understanding of the vocabulary words
- Need to understand how to use proportions and solve for missing variables in one step-one variable equations.
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- **Vocabulary**

- Scale
- Proportion
- Ratio
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- **Materials List**

- Legal sized paper
- Tape measurers
- Rulers

- **State Standards addressed**

Math:

7.2.B Solve single- and multi-step problems involving proportional relationships and verify the solutions.

7.2.D Make scale drawings and solve problems related to scale.

7.2.C Describe proportional relationships in similar figures and solve problems involving similar figures.

Reading:

1.2 Use vocabulary (word meaning) strategies to comprehend text.

2.1.6 Apply comprehension monitoring strategies for informational and technical materials, complex narratives, and expositions: monitor for meaning, create mental images, and generate and answer questions.

- **Leadership Skills**

The recorder will lead in accurately recording the data. The measurer will lead in accurately taking measurements of objects in the front of the class.

- **SCAN Skills/Workplace Skills**

- Responsibility
- Self-Management
- Reasoning
- Seeing things in the Mind's Eye

- **Set-up information**

Teacher will need to gather the following supplies:

- Legal sized paper (or other drawing paper).
- Tape measurers
- Rulers for drawing

The classroom will need to be set up so that the front of the room can be drawn by everyone – desks moved to the back of the room, some set up for students to sit in if they need, and plenty of room on the floor for students to sit and draw.

- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; **-Timeline required**)

- Students will be grouped in pairs. Leadership opportunities involve accuracy (of measurement and recording) and checking one another to make sure that things are accurately taken/recorded.
- It is expected that students will work well together. Students will write a short (2 sentence) written response at the end of the lab discussing how well they thought their partnering went (cooperation, how accurate they took data, whether or not they were on task the entire time, etc.)
- This is a two day lab.

- **Teacher Assessment of student learning** (scoring guide, rubric)

Teacher will assess both the discussion at the end of the lab, and the drawings themselves based on accuracy of scale conversions. Drawings will be scored based on accuracy of depiction – whether or not all the objects in the front of the class are present and to scale.

- **Summary of learning** (to be finished after student completes lab)

- Discuss real world application of learning from lab
- Opportunity for students to share/present learning

- **Career Applications**

A good understanding of space and an accurate depiction of that space is necessary in many applications. These sorts of scale drawings are done ALL THE TIME by architects and engineers. This lab is excellent practice, too, if you want to be a landscape designer, a room stager, or a football coach (or a coach of any sport for that matter). Computer designers and fixers need to use this information

in their work, figuring out how much space there is on a computer or an external storage device. Construction management/ construction workers need to understand scale drawings to build buildings so that they don't fall down. YOU, as you construct scale models of planes and cars, use these principles all the time!

Washington Applied Math Council

<https://wa-appliedmath.org/>

LAB TITLE: Let's Draw Class!

STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**

In order to learn about proportion and ratios, and to put them to use in a practical application, we will draw the front of our classroom to scale.
- **Grouping instructions and roles**
 - Students will gather in groups of 2
 - One student will be measurer and one recorder of measurements, so that at least pairs of people will have the same data.
- **Procedures** – steps to follow/instructions
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 - Measurements will be taken in metric units.
- **Outcome instructions**
- **Assessment instructions** (peer-teacher)

Assessment of the lab will occur during discussion. As long as each student participates in the discussion of scale and proportion and ratios, that student will get credit for the lab. Scale drawings will also be graded on accuracy of scaled items – the math has to be important too!

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Lab Data Collection

Student: _____ **Date:** _____

Unit: 9 – Using Ratios and Proportions

Lab Title: Let's Draw Class!

Criteria: Write the problem/objective in statement form

Data Collection: Record the collected/given data

Calculations: Complete the given calculations to solve for an answer(s)

Summary Statement:

Other Assessment(s)

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