## Lab Template

 Text: CORD Math (green book)

 Volume:
 Chapter:

 Unit number:
 9
 Title of unit:
 Using Ratios and Proportions

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 Date:
 June 27, 2012

### **Attach the Following Documents:**

- 1. Lab Instructions
- 2. Student Handout(s)
- **3.** Rubric and/or Assessment Tool

#### Short Description (Be sure to include where in your unit this lab takes place):

Students will be asked to create a scale drawing of the classroom. This lab will be used to reinforce the use of proportions to find unknown measurements and create scale drawings. This activity will be used after the lesson on comparing ratios is taught.

## Let's Scale Down

### LAB PLAN

#### **TEACHER:** (*Teacher Prep/Lab Plan*)

- ▲ Lab Objective: Students will use the concept of comparing ratios and write proportions to determine scale measurements and draw a scaled down version of the classroom.
- Statement of prerequisite skills needed (Vocabulary, Measurement Techniques, Formulas, etc.) Students will need to understand how to accurately measure spaces and objects both in reality and on graph paper.
- ▲ **Vocabulary:** proportion; ratio; equal ratios; similar figures
- State Standards addressed: (Highlight "Green" Standards, you may use your District's Power Standards if applicable)
  - ▲ Math:
    - A1.1.A Select and justify functions and equations to model and solve problems.
    - A1.1.B Solve problems that can be represented by linear functions, equations, and inequalities.
    - A1.2.B Recognize the multiple uses of variables, determine all possible values of variables that satisfy prescribed conditions, and evaluate algebraic expressions that involve variables.

- A1.2.D Determine whether approximations or exact values of real numbers are appropriate, depending on the context, and justify the selection
- Leadership: Students will be working in small groups of 3-4 so they must work cooperatively to achieve all the measurements that will be needed. As a result of this the students will demonstrate abilities to organize and direct.
- SCAN Skills/Workplace Skills: Students will be using skills that can be applied in construction and architecture.
- ▲ **Teacher Preparation:** (What materials and set-up are required for this lesson?)
  - Materials: large measuring tapes; yardsticks and rulers; calculator; graph paper; pencil and paper; group instructions.
  - ▲ Set-Up Required: Preparation of group instructions so they are visible to all groups initially on overhead but also posted around the classroom and gathering materials.

#### **Lab Organizational Strategies:**

- ▲ Grouping/Leadership/Presentation Opportunities: Students will share their results by each group posting their individual scaled drawings in a group. The students will get a short period to wander and check other group's efforts.
- ▲ Cooperative Learning: In the small groups, students will work to get accurate measurements and record them in a readable format. They will each use the group measurements to create their own scaled drawing using a group determined ratio.
- Expectations: Students will work together in a mature manner to make decisions and work out differences in opinion as they move through this exercise.
- Time-line: This lab will take three class periods and include: instruction preceding this lab covering equal ratios, proportions and solving for equal proportions; room measurements and scale drawing from measurements.

#### A Post Lab Follow-Up/Conclusions (to be covered after student completes lab)

- ▲ Discuss real world application of learning from lab: There will be a brief discussion on what was learned from this activity and how they might use it in the future.
- ▲ Career Applications: Students will be asked to brainstorm where the skills learned from this activity might be used in a career. Thinking outside the box will be encouraged.
- Optional or Extension Activities: Students may design their own extension activity if they wish.

#### Assessment Tool used in this Lesson (scoring method, guide, or rubric)

Lab Scoring Rubric:

Item:			
Group worked cooperatively	3	2	1
Group task was completed within time limit	3	2	1
Student worked well within the group	3	2	1
Student participated in making group decisions	3	2	1
Student used the information and group decisions to make	3	2	1
an accurate scale drawing			
Student completed the drawing within time limit	3	2	1

# Let's Scale Down

#### **Group Instructions**

Your task is to take accurate measurements of the entire classroom:

- Floor
- Walls
- Location of permanent structures
- Doors and windows
- Location of teacher's desk
- Student's desks, decorative items, and ceiling do not need to be included

Using the date your group has gathered, each of you will create your own scaled drawing that will fit on the graph paper provided. You may use more than one sheet but the floor and walls must each fit on one sheet.

You will be working with your group to make all major decisions:

- Who will perform different tasks do you all need to measure different parts of the room together or can you divide and conquer?
- Do you need to measure every part of the room or can you trust that some parts will be the same? Are all corners 90<sup>0</sup> or do you have more than four walls?
- How will your group record the different information you are gathering?
- What type of scale will you use to create your scaled drawing?
- Your group will have only one class period to do your measurements. How will you pace yourselves to complete all your measurements in that time?
- How will you handle any other decisions that have to be made?

#### Assessment Tool used in this Lesson

Lab	Scoring	Rubric:
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Item:			
Group worked cooperatively	3	2	1
Group task was completed within time limit	3	2	1
Student worked well within the group	3	2	1
Student participated in making group decisions	3	2	1
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an accurate scale drawing			
Student completed the drawing within time limit	3	2	1