

Lab Framework

Text: CORD

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

Short Description: This activity has the students using ratios and proportions to assist them in creating a scale drawing of a room. The students need to be able to use tools to measure and calculate area of the room. Also to determine ratio between width and length of the room and how to use this ratio to create the scaled drawing that is in proportion to the actual room.

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Lab Title

Using Measurements to Determine Area of a Room and scale It for a Drawing

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

Students are able to measure a room and determine the following:

Area of the room

Ratio of width to length

Draw a scaled drawing of the room

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

Student can use a measuring tape to measure a length

Student can take measurements and record the measurements

Student can apply conversion skills to relevant story problems

Student can add, subtract, and multiply units of measurement

- **Vocabulary**

Area; Dimensions; Length; Measure; Height; Width; Ratio; Proportional;
Scale

- **Materials List**

Measuring Tape

Calculator

Paper

Pencil or pen

Ruler

- **State Standards addressed**

Math:

1.1.4 - Apply understanding of direct and inverse proportions to solve problems.

1.2 - Understand and apply concepts and procedures from measurements.

2.2.2 - Apply strategies to construct solutions.

3.3.2 - Analyze thinking and mathematical ideas using models, known facts, patterns, relationships, counter examples, or proportional reasoning.

Reading:

1.2.2 - Apply strategies to comprehend words and ideas.

2.1.4 - Apply comprehension monitoring strategies for informational and technical materials, complex narratives, and expositions: use prior knowledge.

2.1.5 - Apply comprehension-monitoring strategies for informational and technical materials, complex narratives, and expositions; synthesize ideas from selections to make predictions and inferences.

2.3.4 - Synthesize information from a variety of sources.

- **Leadership Skills**

 - Student can lead a group to collect and record data

 - Student will make an individual presentation to the class

- **SCAN Skills/Workplace Skills**

 - Basic Skills: C

 - Writing: A

 - Mathematics: A; C

 - Thinking Skills: Creative Thinking; Problem Solving

 - Seeing Things in the Mind's Eye: A; B

 - Reasoning: A; B; C

 - Personal Qualities:

 - Responsibility: B

 - Self-Management: A; C

- **Set-up information**

 - Prior to class put on the teacher's desk the following materials:

 - Tape Measures

 - Paper

 - Rulers

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

 - Divide class into work groups.

 - Members of group determine: who will read the tape measure; who will hold the end of the tape; who will record the measurements

 - Time required: 5 minutes

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

 - Scoring Guide with scoring rubric

- **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

 - How skill helps in determining amount of floor covering for a room

 - Discuss ways that skill could help student remodel/rearrange their bedroom

 - Discuss ways to present data to an audience

- **Optional activities**

 - Taking measurements off of blueprints and calculating area of building

 - Drawing building to another scale based on blueprints

- **Career Applications**

 - Interior Design

 - Construction

 - Engineering

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LAB TITLE: Using Measurements to Determine Area of a Room and scale It for a Drawing

STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
You are to measure the classroom to create a scaled (1:20) drawing of the room. You will also determine the ratio between length and width of the room.
- **Grouping instructions and roles**
The class will be divided into groups of 3 students by the teacher. Each group will have the following roles:
 - Holder of end of tape
 - Reader of measurement
 - Recorder of measurements
- **Procedures** – steps to follow/instructions
 1. Collect a tape measure from teacher
 2. Start at one corner of the room and measure the length of the wall
 3. Record the measurement
 4. Measure the next wall as you go around the room
 5. Record the measurement
- **Outcome instructions**
 1. After the measurements have been recorded, the group gets together to calculate the area of the room
 2. Group determines the ratio of the length to the width of the room
 3. Group uses the ratio to draw a plan of the room that is proportional (1:20 scale)
- **Assessment instructions** (peer-teacher)
 - Assess correctness of measurements
 - Assess proper calculation of area of room
 - Assess results of determination of ratio
 - Assess correction of proportional drawing of the classroom

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Lab Data Collection

Student: _____ Date: _____

Unit: _____

Lab Title: Using Measurements to Determine Area of a Room and scale It for a Drawing

Criteria: Write the problem/objective in statement form

Data Collection: Record the collected/given data

Length of Room: _____

Width of Room: _____

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

Area of Room: _____

Ratio of Length to Width: _____

Summary Statement:

Other Assessment(s)

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Grading Rubric for Lab

Topic	Points Possible	Points Earned
Measuring of walls	15	
Calculation of Area	5	
Correct Ratio	5	
Scaled Drawing	15	

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