Lab Template

Text: Cord
Volume: _____   **Chapter: _____**
Unit number: _9____   **Title of unit: Using Ratios and Proportions_____**
Developed by *(Include contact information)***: _Rob Ashler_____**
Date: 6/28/12_____

Attach the Following Documents:
1. **Lab Instructions**
2. **Student Handout(s)**
3. **Rubric and/or Assessment Tool**

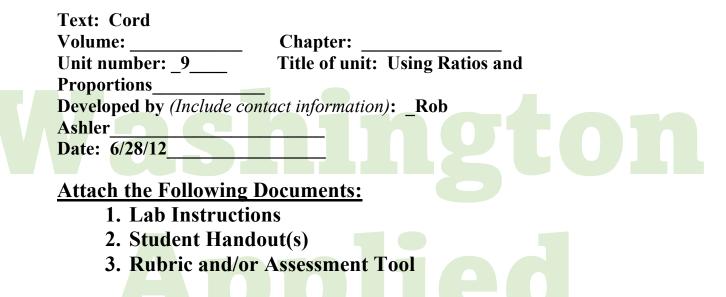**Short Description (Be sure to include where in your unit this lab takes place):**

Students will create three different roof slope models using different proportional rise and run ratios

Insert Title Here

LAB PLAN

TEACHER: *(Teacher Prep/Lab Plan)*
- ⚓ **Students will be able construct three different roof slopes based on given proportional ratios**

- ⚓ **Statement of prerequisite skills needed** *(Vocabulary, Measurement Techniques, Formulas, etc.)*
  Skill with measuring tools
  Knowledge geographic and climatic types
  students understand the concept of ratios and proportions
  knowledge of angles
  Being able to plot ratios on a graph using x and y axis to draw the slope desired.

- ⚓ **Vocabulary**
  construction terms:
  rise
  run
  slope
  peak or ridge

- ⚔ **State Standards addressed:** *(Highlight "Green" Standards, you may use your District's Power Standards if applicable)*
  - ⚔ **Math:** A1.1A
  - ⚔ **Reading:**
  - ⚔ **Writing:**
  - ⚔ **Leadership:**
  - ⚔ **SCAN Skills/Workplace Skills:**

- ⚔ **Teacher Preparation:** *(What materials and set-up are required for this lesson?)*
  - ⚔ Materials:11 x 8.5 card stock
  - ⚔ rulers
  - ⚔ masking tape
  - ⚔ shears
  - ⚔
  - ⚔ Set-Up Required:Pass out card stock, rulers, and cutting tools to each student. Tape will have to shared.

- ⚔ **Lab Organizational Strategies:**
  - ⚔ Grouping/Leadership/Presentation Opportunities:Individual
  - ⚔ Cooperative Learning: students are invited to compared and share their creations
  - ⚔ Expectations:Each student will create three roof slopes for examination by the instructor.
  - ⚔ Time-line:%minutes for instruction and materials distribution, 10 minutes to fabricate(make) your models, 5 minutes for evaluation

- ⚔ **Post Lab Follow-Up/Conclusions** *(to be covered after student completes lab)*
  - ⚔ Discuss real world application of learning from lab:
3 different rise and runs (slopes) given a different set of geographic and climatic areas.
  - ⚔ Career Applications:
In construction of buildings
landscaping and site preparation
road construction
railroad construction
amusement park construction
Military
  - ⚔ Optional or Extension Activities:
The students can build actual scale wood models to further demonstrate their grasp and ability to apply their new knowledge of creating a roof with a given rise and run ratio.

Lab Instructions

1. Each person will collect the following resources:
   - ○ cardstock

- ○ ruler
- ○ scissors
- ○ supply of masking tape

2. Find the exact middle of the cardstock and fold it completely (hamburger wise)
3. Set the folded sheet of paper on a flat surface like a roof. Each side should be 12' long by your scale.
4. The fold is called the **peak** the line running from the peak to the flat surface is called the **rise** and the line runs perpendicular (at a right angle) is called the **run**.
5. The three rise and runs that I want the students to create with the paper are:
   - ▪ 1" per foot
   - ▪ 3" per foot
   - ▪ 6" per foot

   Students should select a measurement on their rulers to represent the scale on their drawing. (Hint: You might need to cut some paper off to achieve the appropriate rise and run)
6. Once the students have folded and achieved the desired rise for an example, they should use the masking tape to secure the shape of the roof. Then place this shape onto a piece of graph paper; and trace. Continue on to the next rise and run until you finish all 3. (you will need to remove the tape from your roof and retape the roof when you determine the next rise and run ratio) All 3 traces should be on the same piece of graph paper, so you can compare.
7. Determine where each roof shape is most applicable, and why?

Rubric for Roof Ratios

	Criteria	

	1	2	3	4	Value
Problem Solving	Little or no understanding of the problem is evidenced.	Numerous errors when solving problems	Few errors when solving problems.	No errors when solving problems	
Math Content	Demonstrates little or no knowledge or application of math skills.	Demonstrates limited knowledge and application of math skills.	Demonstrates a general knowledge and application of math skills.	Demonstrates a clear knowledge and application of math skills.	
Math Communication	Inaccurately communicates solutions to problems and concepts.	Limited communication of solutions to problems and concepts.	Satisfactorily communicates solutions to problems and concepts.	Accurately communicates solutions to problems and concepts.	
Presentation	The reader is unable to follow the steps taken in the solution.	Solution is difficult to follow at times.	Solution is presented in a logical manner.	Solution is presented in an easy follow step-by-step model.	
Use of Mathematical Terminology	No mathematical terminology is used or attempted.	Some math terminology is presented, but not correctly used.	Mathematical terminology correctly used.	Mathematical terminology is prevalent and used correctly.	