Lab Framework

Text:CORD

Unit number and title: Unit 9 "Ratios and Proportions"

Short Description: To use proportions to find the height of not easily measurable objects.

Developed by: Rennie McCormick

Contact Information: rmccormi@omaksd.wednet.edu

Date:June 2008

Lab Title
If a Tree Falls

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**
  To exercise Leadership and Teamwork skills, to use the concepts of ratios and proportions as a strategy in the problem solving process.
- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)
  Student will need to understand "similar" shapes, they will have to have some knowledge about solving equations, and specifically proportions.
- **Vocabulary**
  Similar, cross products, ratio, proportion
- **Materials List**
  Linear measuring device. (Yard stick, Measuring tape)
- **GLEs (State Standards) addressed**
  Math: **1.1.4 Understand the concept of inverse proportion and apply direct and inverse proportion. W**
  1.3.1 Understand the properties of and the relationships among 1-dimensional, 2-dimensional, and 3-dimensional shapes and figures. W
  Reading: **1.3.2 Understand and apply content/academic vocabulary critical to the meaning of the text, including vocabularies relevant to different contexts, cultures, and communities.** W
  Writing: **1.6.2 Uses collaborative skills to adapt writing process.**

- **Leadership Skills**
  Student will be in groups of three. (Team Leader, Recorder, and a Reporter)
- **SCAN Skills/Workplace Skills**

- **Set-up information**
  You will need tape measures or yardsticks and a sunny day.
- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required)**
  This can be done with very little setup and should take 30 minutes for measuring and problem solving. Presentation will be approx. 5-10 minutes
- **Teacher Assessment of student learning** (scoring guide, rubric)
  Participation

- **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

- **Optional activities**
  You could turn this into a business bidding on painting or residing the gym. You could also have them extend this idea to measure flat distances where an object is in the way.
- **Career Applications**
  Tree surgeon, siding specialists, house painters

LAB TITLE: If a Tree Falls
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**

  If a tree falls in the yard will it take out the garage? In many jobs people are asked to give an evaluation of a situation involving measurements that are not easily attained with measuring tools. In these instances using mathematics, and specifically ratios and proportions can help. For instance Mr. Newton is worried that a tree is his yard has grown tall enough to hit his garage if the wind were to blow it over. How can he get an accurate measurement of the tree without climbing to the top?

- **Grouping instructions and roles**

  Groups of three, elect a Team Leader who will act as facilitator and time keeper, a recorder who will keep written documentation of the process and the results, and a presenter who will share the groups findings to the larger group. All members will participate in the data collection and problem solving process.

- **Procedures** – steps to follow/instructions

  Each group will get a tape measure, a calculator, and materials to record their information. As a group there are two measurements you will be expected to find. You will find the height of a tree in the school yard and you will find the height of the gymnasium. Your group will present their problem solving strategy and defend the accuracy of your findings.

Lab Data Collection

Student: _____ **Date:** _____

Unit: 9

Lab Title: If a tree falls

Criteria: Write the problem/objective in statement form

Before we go outside and start measuring what data do we need to collect? To decide this we need to have a strategy of how we will use the data to solve the problem. Develop a strategy and check with a neighboring group to get their feedback. The presenter needs to be prepared to share your strategy with the whole class.

Data Collection: Record the collected/given data

What objects did you choose to measure? Record your findings.

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

Write and solve a proportion. Was there another way to find the desired heights? If yes, do they match the answers you found using a proportion?

Describe how you could use this idea in another situation.

Other Assessment(s)

Record the names of all participating team members. Present your findings to the class. Submit this form to the teacher.