Lab Framework

Text: CORD

Unit number and title: 9- Ratio and Proportion

 Short Description: Create a pyramid out of rolled up newspaper that is a fraction of
the size of the Mega- City Pyramid.

Developed by: Jody Clark

 Contact Information: jclark@nkschools.org

Date: June 25, 2008

Lab Title
Building the Pyramids

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

   Construct a 4 level pyramid out of rolled up newspaper that has a ratio of
   1/100 the size of the Mega-City pyramid.

- **Statement of pre-requisite skills needed:** Measuring in metric units, calculator
   usage, find ratios of numbers

- **Vocabulary**

   Ratio, similar ratios, scale drawing

- **Materials List**

   Newspaper, masking tape, rulers/meter sticks, lab worksheet
   DVD from Extreme Engineering on the Mega City pyramid

- **GLEs (State Standards) addressed**

   Math: 1.2, 2.2.2, 1.3.1
   Reading: 2.1.5, 3.2.2
   Writing: 2.3.1, 3.1.1

- **Leadership Skills**

   Use team roles from CPM book, facilitator, task manager, recorder, and
   materials coordinator

- **Set-up information**

   -run copies worksheets, one per student; set up table with materials;
   group students

- **Lab organization**-

   Assume group positions and work as a team to create and present project to the
   class. This will take about 1 week to complete

- . **Teacher Assessment of student learning**

   Scoring guide awarding 5 points for each task completed: correct
   measurements, accuracy of conversions of ratios and measurements, active
   participation

Summary of learning
   o Each team will share their calculations and pyramid with the class. The teachers should ask for possible career applications that this would apply and discuss them. Examples are given below.

- **Optional activities**
   As a lead in activity have the students build a pyramid out of string and drinking straws
   Construct all 8 levels of the pyramid
   Create a pyramid of different ratios, have different groups do different ratios, Then compare the ratios
   Convert metric units to English units
- **Career Applications**
   -Architecture, creating blueprints
   -In finance, ratios are used to for bank loans and credit cards
   -Construction, measurement needs to be accurate to have a building pass codes and inspection

LAB TITLE: Building the Pyramids
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**

  A construction company bidding on the Mega city pyramid project wants to have a replica 1/100th the size of the actual structure. They want you to create the model.

- **Grouping instructions and roles**

  Students may work in teams of two to four. In the first section, students use the calculator to find the ratio of the actual size of the Mega city pyramid to that 1/100th size. Once the group has the dimensions, the group starts cutting, rolling, and taping newspaper for the sides of the triangles that will be put together to create the pyramid.

- **Procedures** – steps to follow/instructions
  1. Take the perimeter of the base of the Mega city pyramid, which is 2000 meters and calculate the side length of the Mega city pyramid.
  2. There are 8 triangles across the base of each side. Calculate the length of each triangle base.
  3. Take your calculations from step 2 and convert to 1/100th ratio.
  4. Even though the Mega city pyramid is 8 levels, build a pyramid that is 4 levels. Figure out how many triangles will be needed for each level and start cutting your newspaper to the 1/100th ratio and start rolling and taping your triangle sides.
  5. Since newspaper is not the ratio length of the sides of the triangles, calculate the proportion of the newspaper to the ratio.
  6. NO HITTING EACH OTHER WITH NEWSPAPER ROLLS!!! This will result in a failing grade!!!!
  7. Start constructing your pyramids.

- **Outcome instructions**

- **Assessment instructions** (peer-teacher)

  Students will be assessed on the accuracy of their calculations and their construction of their pyramid.

https://wa-appliedmath.org/

Lab Data Collection

Student: _____ **Date:** _____

Unit: 9- Ratios and proportions

Lab Title: Building the Pyramids

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)