Lab Framework

Text: CORD Unit 16 Solving Problems that involve linear Equations
Unit 16 Measuring in Inches and Centimeters

Short Description: Measure classroom items in centimeters and inches and graph the results to determine if there is a linear relationship between inches and centimeters.

Developed by: Jim Welsch

Contact Information: jimw@cksd.wednet.net

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Lab Title
Measuring in Inches and Centimeters

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

    To determine if a linear relationship exists between centimeters and inches.

- **Statement of pre-requisite skills needed**
- Measuring skills in metric and English units

- **Vocabulary**

    Linear relationships, equations, and definitions of linear equations.
- **Materials List**
- **Tape measure marked in inches**
- **Tape measure marked in centimeters**
- **Calculator**
- **Lab Data/Record sheet**
- **Graphing paper and materials**

- **State Standards addressed**

    Math:

A1.1A   Select and justify functions and equations to model and solve problems
A1.1B   Solve problems that can be represented by linear functions, equations, and inequalities.
A1.4.B Write and graph an equation for a line given the slope and the y-intercept, the slope and a point on the line, or two points on the line, and translate between forms of linear equations.

    Reading:
        3.1.1
        3.1.2

    Writing:
        3.2.2
        3.3.1
        3.3.2
        3.3.3

- **Leadership Skills**

- 1. Honestly, integrity, and trust;
- 2. Respect for self and others;
- 3. Responsibility for personal actions and commitments;
- 4. Self-discipline and moderation;
- 5. Diligence and a positive work ethic;
- 6. Healthy and positive behavior

- **SCAN Skills/Workplace Skills**
- Unit three deals with measurement in the metric and standard system. Skills developed in this unit are useful in a variety of careers.
- Construction Trades: Of course this industry could not exist without the use of measurement. Though most trades in the U.S. are still stuck in the Imperial system, someday we may get a clue and join the rest of the world.
- Science and Manufacturing: Most scientific fields use the metric system, though it is useful to be able to convert from one system to the other.
- Health and Medicine: These fields rely heavily on precise measurement and understanding all the various units.
- Automotive Repair: Using both the metric and standard system is necessary for this career.

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- **Set-up information**
  1. Gather tape measures.
  2. Copy lab data sheets
- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required)**

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

- **Optional activities**

- **Career Applications**

https://wa-appliedmath.org/

LAB TITLE: <u>Measuring in inches and centimeters</u>

STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
- **Is there a linear relationship between inches and centimeters?**

- **Grouping instructions and roles**
  Divide into groups of two.

- **Procedures** – steps to follow/instructions
  Follow directions on Data collection sheet.

- **Outcome instructions**

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

Lab Data Collection

Student: _____ **Date:** _____

Unit: Unit 16

Lab Title: <u>Measuring in inches and centimeters</u>

- **Criteria: What is the linear relationship between inches and centimeters?**

Data Collection: Record the collected/given data

Unit 16 Measuring in inches and centimeters Lab

1. Measure the items listed on the left side of the data sheet table and record the data in both inches and centimeters.

ITEM	INCHES	CENTIMETERS	COMMENTS
Width of a sheet of notebook paper			
Length of a sheet of notebook paper			
Width of classroom door			
Height of class room door			
Width of teachers desk			
Length of teachers desk			
Width of student desk			
Length of student desk			

2. Graph the data with the centimeters values on the vertical axis and the inches measurement on the horizontal axis.

3. Draw an unbroken line that best connects the eight points from the data sheet.
4. Choose any two points on the line. Use points on the line.
5. Using the points subtract the smaller centimeter point from the larger. This value is the rise or Δ cm. _____
6. Repeat the same process for the inches using the corresponding point or the inches, horizontal axis. This is the run or Δ inches._____
7. Divide Δ cm by Δ inches. This is the slope of the graphed line and is the m in the slope intercept formula y = mx + b.

8. Compare the slope to the value 2.54 in the equation *l(cm) = 2.54 x l(in).*

Is the answer close? _____ If not why not? _____
_____

9. For your graphed line what is the *y – intercept – the y value (cm axis)* for *x = 0 (inch axis).* _____
10. Does the answer make sense? _____

Summary Statement:

Other Assessment(s)