Lab Framework

Text: CORD

Unit number and title: Unit4: Using Graphs, Charts and Tables

 Short Description: Using a table, graph data gathered through experimentation

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Lab Title

Graphing Cents: A Stretching Experience

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

  Students will, in a cooperative group:

  Use a ruler to measure rubber band stretch in millimeters

  Complete a table with data gathered as part of an experiment

  Using proper graphing techniques (TAILS), graph the data

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

  Ability to measure in millimeters

  Ability to use proper graphing techniques

  Ability to count to 10

- **Vocabulary**

  Millimeters

  Pennies

  Cup

  Rubber Band

- **Materials List**

  Paper (preferred) cup

  Long rubber band (best 6", not too thick)

  1 ruler per group, in mm increments

  100 pennies

  Bag for materials

  Anchor points in classroom (door knobs, map hangers, hinge pins, etc.) 1 for each group

  Copies of table for each student

  Writing instrument

- **State Standards addressed**

  Math: 6.2.B Draw a first-quadrant graph in the coordinate plane to represent information in a table or given situation.

  Reading: 3.1.1 Follows multi-step written directions

- **Leadership Skills**

  Working in cooperative groups, the group will self select a leader

- **SCAN Skills/Workplace Skills**

  Uses tables, graphs, diagrams, and charts to obtain or convey quantities information

- **Set-up information**

Place pennies, cup (with hole punched in upper portion below lip for rubber band to slip through) and rubber band in bag. Make sure you have enough anchor points in your classroom for the number of students you have, if you don't, adjust group size and roles accordingly. TEST YOUR ANCHOR POINTS. Create enough copies of the data chart for your students.

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

  Students, in a group of 2 or 3 will self select a leader/writer, a measurer and a pennies person. This may need to be adjusted based upon classroom anchor point availability.

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

  Rubric 0-4 scale (create your own)

  Were students able to work in a cooperative group?

  Was the work done in a neat and presentable fashion?

  Was the data gathered at an acceptable level of accuracy?

  Was the graph produced (by each student) in the correct format and did it accurately represent the data?

- **Summary of learning** (to be finished after student completes lab)

  Student graphs will be displayed around the room to show the variety of data gathered. A supplemental discussion might be why we see variability in the data.

- **Optional activities**

  Linear regression for the data gathered.

- **Career Applications**

  Measuring skills

  Accuracy in completing forms

  Cooperative work ethic

  Understanding of designed variability in an experimental model

LAB TITLE: Graphing Cents: A Stretching Experience

STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**

  Using a designed apparatus, you will measure the amount of stretch of a rubber band given a different set of weights being added to a cup. Once this data is recorded completely, students will graph the data using standard techniques.

- **Grouping instructions and roles**

  Group in 2 or 3 with the following roles:
  Leader/writer
  Measuring person
  Weights person

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

  Obtain materials: 1 bag with cup, rubber band, 100 pennies, ruler in mm increments
  Find an appropriate anchor point in the room. Suggestions are: door knob, hinge pin, a meter stick between two desks, etc. Ask me if unsure.
  Once you have an anchor point, loop rubber band over anchor point and <u>without stretching</u> measure the anchor point to the closest point on the cup. Write this down on the data chart.
  Add 10 pennies, remeasure the stretched rubber band distance
  Repeat, adding 10 pennies each time.
  You will have 11 data points.
  Once done, clean up, return materials and make sure each member of your group has their own data table.

- **Outcome instructions**

  Once you have this done, we will start on our graphing activity.
  Using TAILS mnemonic as a guideline, draw an appropriate graph to represent the data.

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

  Rubric 0-4 scale (create your own)
  Were students able to work in a cooperative group?
  Was the work done in a neat and presentable fashion?
  Was the data gathered at an acceptable level of accuracy?
  Was the graph produced (by each student) in the correct format and did it accurately represent the data?

Lab Data Collection

Student: _____ **Date:** _____

Unit: _____

Lab Title:

Members of your group: _____

Pennies	Stretch
0	
10	
20	
30	
40	
50	
60	
70	
80	
90	
100	