WAMC Lab Template

Math Concept(s): Linear Equations and Measuring Skills
Source / Text: CORD Labs and Real World Applications
Developed by: Jerry Rice   E-Mail: jrice@sheltonschools.org Date: 6.21.2022

Attach the following documents:
- Lab Instructions
- Student Handout(s)
- Rubric and/or Assessment Tool

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

Lab Plan
Lab Title: Centimeters and Inches

Prerequisite skills: measuring, graphing coordinate points

Lab objective: To graph a linear equation and to calculate the relationship between the 'x' and 'y' values in the form y=mx+b

Standards: *(Note SPECIFIC relationship to Science, Technology, and/or Engineering)*
Mathematics K–12 Learning Standards:
- http://www.corestandards.org/Math/Content/HSA/CED/A/2/ Create equations that describe numbers or relationships.
- http://www.corestandards.org/Math/Content/HSA/REI/D/10/ Represent and solve equations and inequalities graphically.

Standards for Mathematical Practice:
- #6 Attend to Precision

K-12 Learning Standards-ELA (Reading, Writing, Speaking & Listening):
- http://www.corestandards.org/ELA-Literacy/RST/9-10/3/ Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks…

K-12 Science Standards
-

Technology

- 5.b. Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making

Engineering

- https://www.nextgenscience.org/topic-arrangement/hsengineering-design#:~:text=HS%2DETS1%2D2,solved%20through%20engineering. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

Leadership/21st Century Skills:

21st Century Interdisciplinary themes (Check those that apply to the above activity.)
☐ Global Awareness ☐ Financial/Economic/Business/Entrepreneurial Literacy ☐ Civic Literacy
☐ Health/Safety Literacy ☐ Environmental Literacy

21st Century Skills (Check those that students will demonstrate in the above activity.)

LEARNING AND INNOVATION	INFORMATION, MEDIA & TECHNOLOGY SKILLS	LIFE & CAREER SKILLS	Productivity and Accountability
Creativity and Innovation	Information Literacy	Flexibility and Adaptability	☐ Manage Projects
☐ Think Creatively	☐ Access and Evaluate Information	☐ Adapt to Change	☐ Produce Results
☐ Work Creatively with Others	☒ Use and manage Information	☐ Be Flexible	Leadership and Responsibility
☐ Implement Innovations	Media Literacy	Initiative and Self-Direction	☐ Guide and Lead Others
Critical Thinking and Problem Solving	☐ Analyze Media	☐ Manage Goals and Time	☐ Be Responsible to Others
☐ Reason Effectively	☐ Create Media Products	☐ Work Independently	
☐ Use Systems Thinking	Information, Communications and Technology (ICT Literacy)	☐ Be Self-Directed Learners	
☐ Make Judgments and Decisions	☒ Apply Technology Effectively	Social and Cross-Cultural	
☐ Solve Problems		☐ Interact Effectively with Others	
Communication and Collaboration		☐ Work Effectively in Diverse Teams	
☒ Communicate Clearly			
☐ Collaborate with Others			

<u>Teacher Preparation: (What materials and set-up are required for this lab?)</u>

Materials

-

Set-Up Required:

-

<u>Lab Organization Strategies:</u>

Leadership (Connect to 21st Century Skills selected):

-

Cooperative Learning:

-

Expectations:

-

Timeline:

-

<u>Post Lab Follow-Up/Conclusions:</u>

Discuss real world application of learning from lab

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Career Applications

-

Optional or Extension Activities

-

Jerry Rice

Applied Algebra

Math Lab: Centimeters and Inches

Instructions:

You are going to measure an assortment of items in both inches and centimeters. These measurements will become the ordered pairs that you will graph. For each item you measure, you should have an ordered pair – (i, c). Once you have gathered your measurements, you will graph the centimeter values on the y axis and the inch values on the x axis.

Equipment:

Calculator, measuring device with both inches and centimeters, data table to record measurements, graph paper.

Procedure:

NOTE!!! All measurements should be taken in both inches and centimeters!

1. Measure and record the width of a piece of paper.
2. Measure and record the length of a piece of paper.
3. Measure and record the width of the classroom door.
4. Measure and record the length of the classroom door.
5. Measure and record the width of the teacher's desk.
6. Measure and record the length of the teacher's desk.
7. Measure and record the width of your table.
8. Measure and record the length of your table.
9. Graph the data. Use a piece of graph paper. You will need only quadrant one – you should have no negative values. Label the x axis Centimeters, and the y axis Inches. Consider

the range of your data. Make the scale for each axis fit the data for that axis.

10.   Draw a straight line that connects the data points. If any of your points are not on the line, check those measurements. They may be wrong.

11.   Calculate the slope of the line. Show your work. What does this slope represent?

Name(s): Jerry Rice
Email Address: jrice@sheltonschools.org
Lesson Title: Centimeters and Inches
Date: 6.21.2022 (Summer Solstice)
Text: CORD: Algebra I Labs and Real World Applications.   STEM
Correlation: Lesson Length: One to two days.

Big Idea (Cluster): Linear equations
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- Mathematical Practice(s): #6 Attend to Precision

Content Objectives: Graphing linear equations, creating a scale to fit the data.	Language Objectives (ELL):
Vocabulary: Axis, centimeters	Connections to Prior Learning
Questions to Develop Mathematical Thinking: • Why will this process result in a linear equation? • How many points on that line will make a true statement of the equation?	Common Misconceptions: • I can't do this. • Accuracy does not matter. (this will often look like students 'free-handing' their graphs)

Assessment (Formative and Summative):

• Summative: Student's products from the lab.

Materials:

• Measuring tools and data tables.

Instruction Plan:

Introduction: Suppose you were driving at 50 miles per hour. How far would you travel in one hour? In two hours? In three and one half hours?
Explore: Plot these points on a graph – time on the x axis and distance on the y axis. Do they create a straight line?
When I observe students: They should be measuring stuff and recording their data in a table.
Questions to Develop Mathematical Thinking as you observe: What if your measurements are not accurate? What will happen if your graph is not accurate?
Answers: Your graph will not be a straight line, or it will be a straight line on a graph that means very little.
Summarize: If we draw our graph accurately, and calculate the slope accurately, we can use the equation to make predictions for either variable.

Career Application(s):

- Precision and accuracy are important in a wide range of careers.

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https://wa-appliedmath.org/