Lab Framework

Text:CORD

Unit number and title: Unit 11 – Using Signed Numbers and Vectors

Short Description: Learning that numbers may have positive and negative attributes as well as numbers with force, direction, and magnitude are known as vectors.

Developed by: Sally Wehle

Contact Information: Sally.Wehle@vansd.org

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Lab Title
Penny Drop

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

  This is a hand-on activity for students to work in groups of three (3) and as individuals to learn about and calculate using signed numbers.

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

  Write numbers
  Know how to use a calculator

- **Vocabulary**

  Positive
  Negative
  Minus
  Plus
  Increase
  Decrease
  Origin
  Number Line

- **Materials List**

  Butcher paper in several colors
  Tape
  Sharpie felt pen – Black
  Yard Stick or Straight Edge
  Pennies
  Paper and pencils
  Calculators or calculator on computer

- **GLEs (State Standards) addressed**

Math:

1.1.1 Understand and use scientific notation. W

1.1.6 Complete multi-step computations with combinations of rational numbers using order of operations and addition, subtraction, multiplication, division, powers, and square roots. W

1.2.1 Understand the relationship between change in one or two linear dimension(s) and corresponding change in perimeter, area, surface area, and volume. W

1.2.5 Use formulas to determine measurements related to right prisms, cylinders, cones, or pyramids. W

1.3.1 Understand the properties of and the relationships among 1-dimensional, 2-dimensional, and 3-dimensional shapes and figures. W

1.3.2 Use the properties of and relationships among 1-dimensional, 2-dimensional, and 3-dimensional shapes and figures including prisms, cylinders, cones, and pyramids. W

1.5.6 Apply properties to solve multi-step equations and systems of equations. W

2.1.1 Formulate questions to be answered to solve a problem. W

2.1.3 Identify what is known and unknown in complex situations. W

2.2.2 Apply mathematical concepts and procedures from number sense, measurement, geometric sense, probability and statistics, and/or algebraic sense to construct solutions. W

Reading:

1.2.2 Apply strategies to comprehend words and ideas.

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

3.3.1 Apply appropriate reading strategies for interpreting technical and non-technical documents used in job-related settings.

Writing:

2.1.1 Applies understanding of multiple and varied audiences to write effectively.

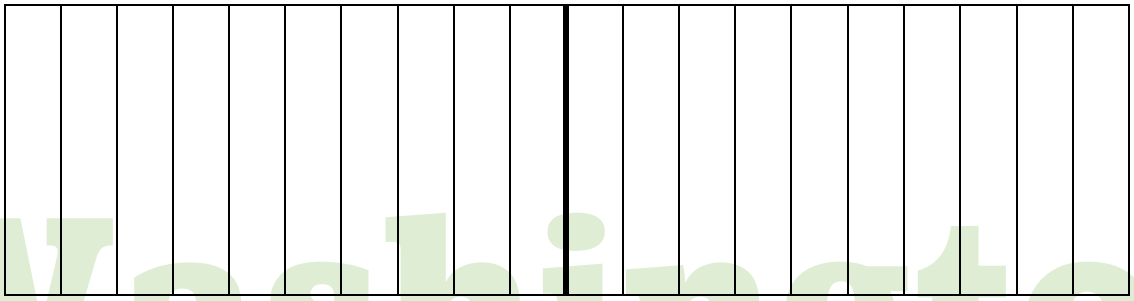
2.2.1 Demonstrates understanding of different purposes for writing.

3.1.1 Analyzes ideas, selects a manageable topic, and elaborates using specific, relevant details and/or examples

- **Leadership Skills**
- **SCAN Skills/Workplace Skills**
- **Set-up information**

Each group will need a number line sheet: size 3' X 8'
Each 3' X 8' will be a different color or color combination
Each 3' X 8' sheet will have a Number Line from +40 to -40,
see shortened example:

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10



Each group will be given a form and pencil to fill out with each student results
See Table Below:

Drop Penny Recording			
Drops	**Student's Name**	**Student's Name**	**Student's Name**
Straight from Chin			
Left Elbow			
Right Elbow			
Left Hand			
Right Hand			

- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required)**
  Create groups of three (3) students which will consist of a
  "Dropper"
  "Recorder"
  "Retriever"

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

Penny Drop Rubric			
Number		Student's Name	Period
	Item	Points Possible	Points Earned
1	Team Names		
2	5 Drops with Signed Numbers		
3	Total Calculation		
	Total Assignment Points		

- **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
  Where do you find signed numbers?
  What common uses can you find for signed numbers?
  What careers would use signed numbers?

- **Optional activities**

- **Career Applications**
  Finance
  Aeronautics
  Weather
  Transportation
  Automotive
  Mechanics

LAB TITLE:_____
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
- **Grouping instructions and roles**
- **Procedures** – steps to follow/instructions
- **Outcome instructions**
- **Assessment instructions** (peer-teacher)

Lab Data Collection

Student: _____ Date: _____

Unit: _____

Lab Title:

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)