Lab Framework

Text: CORD

Unit number and title: Unit 17-Graphing Data

Short Description: Unit 17-Graphing Data

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Lab Title

Linear Stained Glass Graphing Lab

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

  Student Voice:

  - I can demonstrate understanding of the *y*-intercept $=b$ when graphing
  - I can demonstrate understanding of the slope as the co-efficient of x in the slope-intercept form of an equation ($y=mx+b$).
  - I can demonstrate understanding of slope as rise over run when graphing the slope-intercept form of equation ($y=mx+b$).
  - I can graph an oblique (diagonal) line **then** determine the slope-intercept form of an equation ($y=mx+b$).
  - I can graph an oblique (diagonal) line **from** the slope-intercept form of an equation ($y=mx+b$).
  - I can graph a horizontal line **from** the slope-intercept form of an equation ($y=mx+b$).
  - I can graph a vertical line using $x=$
  - I can use a coordinate (x,y) table to find points that are solutions to lines in the slope-intercept form of an equation ($y=mx+b$) or the x= form.

- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)
  - Coordinate graphing skills
  - Concept of slope as rise over run from point to point
  - Concept of *y*-intercept, (where the line crosses the *y*-axis, when $x=0$ in the *y*-intercept form).
  - slope-intercept equation

- **Vocabulary**
  1. slope
  2. rise over run
  3. y-intercept
  4. slope intercept form of an equation
  5. horizontal
  6. vertical

- **Materials List**

  Graph paper, pencils, erasers, rulers marking pens, coloring supplies.

- **GLEs (State Standards) addressed**
  Math: Graph data as points on a coordinate system 1.5, 1.5.5
  Graph as equation 1.5, 1.5.2
  Find the slope of a graphed line 1.1, 1.1.6, 1.3.3, 1.4, 1.4.5, 1.5, 1.5.1, 1.5.2, 1.5.4, 1.5.5, 1.5.6, 2.1, 2.1.1, 2.1.2, 2.1.3, 2.2, 2.2.2, 2.2.3, 2.2.4, 3.1, 3.1.1, 3.2, 3.2.1, 3.2.2, 3.3, 3.3.1, 3.3.2, 3.3, 3.3.3, 4.1, 4.1.1, 4.2, 4.2.1, 4.2.2, 4.2.3, 5.1, 5.5.1
  Find the intercepts of a graphed line 1.1, 1.1.6, 1.3.3, 1.4, 1.4.5, 1.5, 1.5.1, 1.5.2, 1.5.4, 1.5.5, 1.5.6, 2.1, 2.1.1, 2.1.2, 2.1.3, 2.2, 2.2.2, 2.2.3, 2.2.4, 3.1, 3.1.1, 3.2, 3.2.1, 3.2.2, 3.3, 3.3.1, 3.3.2, 3.3, 3.3.3, 4.1, 4.1.1, 4.2, 4.2.1, 4.2.2, 4.2.3, 5.1, 5.5.1
  Reading: 1.2 Use vocabulary (word meaning) strategies to comprehend text
- **Leadership Skills**
  1.5 Self advocacy- if help needed
  1.6 Self management of time and resources
  2.1 Communicate, participate, and advocate in pairs, small groups or teams to reach common goals.
- **Set-up information**
  Prior teaching of linear equations and how they relate to the graph of a line
- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required)**
  Peer sharing with individual work turned in. Teacher check-ups throughout project.
- **Teacher Assessment of student learning**
  Scoring Rubric attached to student page
- **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
- **Career Applications**
  CAD design mock-up

LAB TITLE: Linear Stained Glass Graphing Lab

STUDENT INSTRUCTIONS:

Statement of problem /Introduction:

For this lab project, you will be using your knowledge of linear graphing to algebraically design a modernistic stained glass window pane. Your preliminary work will include choosing linear equations that you can graph using slope intercept form on your window, and corresponding coordinate tables of values. Your model window will be finished when it is fully colored and labeled.

- **Learning targets addressed by lab**

  Student Voice:

  - I can demonstrate understanding of the *y*-intercept $=b$ when graphing
  - I can demonstrate understanding of the slope as the co-efficient of x in the slope-intercept form of an equation ($y=mx+b$).
  - I can demonstrate understanding of slope as rise over run when graphing the slope-intercept form of equation ($y=mx+b$).
  - I can graph an oblique (diagonal) line **then** determine the slope-intercept form of an equation ($y=mx+b$).
  - I can graph an oblique (diagonal) line **from** the slope-intercept form of an equation ($y=mx+b$).
  - I can graph a horizontal line **from** the slope-intercept form of an equation ($y=mx+b$).
  - I can graph a vertical line using $x=$
  - I can use a coordinate (x,y) table to find points that are solutions to lines in the slope-intercept form of an equation ($y=mx+b$) or the x= form.

- **Grouping instructions and roles**

  You may consult with a friend, but must submit a unique design, unlike anyone else's!

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

  - ❑ Using a pencil and ruler, center x-axis and y-axis **on lines** on your graph paper. Extend your axes to the edges of your paper.
  - ❑ Appropriately number your axis with positive and negative integers.
  - ❑ Using a pencil and ruler, create a decorative arrangement of any **6 horizontal** and any **6 vertical** lines ON the graph paper lines
  - ❑ Using pencil, label your horizontal and vertical lines at the edge of your paper.
  - ❑ Fill – in the corresponding coordinate (x,y) table with the equation of the line at the top of the table.
    - ***Have your teacher check your progress!***
  - ❑ Using a pencil, draw **6 points** on the *y*-axis where $x=0$.
  - ❑ Using a pencil and ruler, **draw ONLY 3 diagonal** lines through **3** of the points from edge to edge of the paper.

- ❑ Fill-in the slope and y-intercept. Fill – in the corresponding coordinate (*x,y*) table with the equation of the line at the top of the table and label the lines with the equation.
  - ***Have your teacher check your progress!***

- ❑ Determine **3 new linear equations** and write the equations in the top of the last 3 coordinate (*x,y*) tables.
- ❑ Determine the slope, and y-intercept. Fill in the corresponding (x,y) values
- ❑ Graph the last three lines from your tables and label the lines with the equation in pencil.
  - ***Have your teacher check your progress!***
- ❑ Darken your graphed lines with marker.
- ❑ Color your design, check your work against your rubric, and turn in!

- **Outcome instructions:**
  Turn-in your colored and labeled modernistic stained glass design.
  Turn-in your Data Collection Sheet including coordinate tables and corresponding equations with rubrics for grading.

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

The following targets will be assessed as graded scores in the grade-book.

Target 1: For Horizontal lines:

- I can demonstrate understanding of the *y*-intercept =*b* when graphing
- I can demonstrate understanding of the slope as the co-efficient of x in the slope-intercept form of an equation ($y=mx+b$).
- I can demonstrate understanding of slope as rise over run when graphing the slope-intercept form of equation ($y=mx+b$).
- I can use a coordinate (x,y) table to find points that are solutions to lines in the slope-intercept form of an equation ($y=mx+b$) or the x= form.
- I can graph a horizontal line **from** the slope-intercept form of an equation ($y=mx+b$).

Target 2: For Vertical lines:

- I can use a coordinate (x,y) table to find points that are solutions to lines in the slope-intercept form of an equation ($y=mx+b$) or the x= form.
- I can graph a vertical line using *x*=

Target 3: For Oblique (Diagonal) lines:

- I can demonstrate understanding of the *y*-intercept =*b* when graphing
- I can demonstrate understanding of the slope as the co-efficient of x in the slope-intercept form of an equation ($y=mx+b$).
- I can demonstrate understanding of slope as rise over run when graphing the slope-intercept form of equation ($y=mx+b$).
- I can graph an oblique (diagonal) line **then** determine the slope-intercept form of an equation ($y=mx+b$).
- I can graph an oblique (diagonal) line **from** the slope-intercept form of an equation ($y=mx+b$).
- I can use a coordinate (x,y) table to find points that are solutions to lines in the slope-intercept form of an equation ($y=mx+b$) or the x= form.

Target 4: For The Stained glass window pane model:

- I can create a model of a stained glass window indicating the equations of each line, and the colors of the areas, and indicate the lead.

Rubric:

	4 points	**3 points**	**2 points**	**1 point or 0**
Target 1: For Horizontal lines **Score:**	Student work demonstrates outstanding knowledge of 5 out of 5 targets.	Student work demonstrates adequate knowledge of at least 4 out of 5 targets.	Student work demonstrates misconceptions on many of the 5 targets.	Student work demonstrates misconceptions on many of the 5 targets or the work was incomplete.
Target 2: For Vertical lines **Score:**	Student work demonstrates outstanding knowledge of 2 out of 2 targets.	Student work demonstrates adequate knowledge of at least 1 out of 2 targets.	Student work demonstrates misconceptions on many of the 2 targets.	Student work demonstrates misconceptions on many of the 2 targets or the work was incomplete.
Target 3: For Oblique (Diagonal) lines **Score:**	Student work demonstrates outstanding knowledge of 6 out of 6 targets.	Student work demonstrates adequate knowledge of at least 5 out of 6 targets.	Student work demonstrates misconceptions on many of the 6 targets.	Student work demonstrates misconceptions on many of the 6 targets or the work was incomplete.
Target 4: For The Stained glass window pane model **Score:**	Student work demonstrates superior ability to follow directions to complete the model	Student work demonstrates adequate ability to follow directions to complete the model	Student work demonstrates some ability to follow directions to complete the model	Student work demonstrates inability to follow directions to complete the model or work was incomplete

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Lab Data Collection

Student:_____ **Date:** _____ **Period**____

Unit: Unit 17-Graphing Data

Lab Title: **Linear Stained Glass Graphing Lab**

Criteria: Write the problem/objective in statement form

Data Collection: Record the collected/given data

Horizontal lines												
$y=$		$y=$		$y=$		$y=$		$y=$		$y=$		
x	y	x	y	x	y	x	y	x	y	x	y	

Vertical Lines

x=		*x*=		*x*=		*x*=		*x*=		*x*=	
x	*y*	*x*	*y*	*x*	*y*	*x*	*y*	*x*	*y*	*x*	*y*

Oblique (diagonal) lines

y=		*y*=		*y*=		*y*=		*y*=		*y*=	
Slope =		*Slope* =		*Slope* =		*Slope* =		*Slope* =		*Slope* =	
y-intercept =		*y-intercept* =		*y-intercept* =		*y-intercept* =		*y-intercept* =		*y-intercept* =	
x	*y*	*x*	*y*	*x*	*y*	*x*	*y*	*x*	*y*	*x*	*y*

Check your work against the rubric, and turn it in!!

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