UNIT PLAN

Subject/Grade Level: 9th Grade Algebra 1
Unit #: 4
Unit Name: Graphing Linear Equations and Inequalities

Big Idea/Theme:
The ability to graph will allow students to model a variety of real-world situations.

Culminating Assessment:
Stained Glass Window Project will require students to graph linear equations. See attached.

Unit Understanding(s)
Students will understand:
- Lines can be graphed using a table of values
- Slope and y intercepts have various affects on a graph
- Real world applications have x and y intercepts
- Lines can be graphed using a given slope and point

Unit Essential Question(s):
- How do you create a table of values from a linear equation?
- What are the affects that slope and y intercepts have on a graph?
- What is the meaning of x and y intercepts in real world applications?
- How do you use the slope and a given point to graph a line?

Students will know…/Students will be able to…
- Graph a line using a table of values.
- Analyze affects of slope and y intercepts on a graph.
- Determine the x and y intercepts from real world applications.
- Graph lines using a given slope and point.

South Carolina Academic Standards:
*EA-3.5 Carry out a procedure to graph parent functions.
EA-5.1 Carry out a procedure to graph a line when given the equation of a line.
EA-5.2 Analyze the effects of changes in the slope, \( m \), and the y-intercept, \( b \), on the graph of \( y = mx + b \).
EA-5.3 Carry out a procedure to graph the line with a given slope and a y-intercept.
EA-5.4 Carry out a procedure to graph the line with a given slope passing through a given point.
*EA-5.5 Carry out a procedure to determine the x-intercept and y-intercept of lines from data given tabularly, graphically, symbolically, and verbally.
*EA-5.6 Carry out a procedure to determine the slope of a line from data given tabularly, graphically, symbolically, and verbally.
* EA-5.7 Apply the concept of slope as a rate of change to solve problems.
*EA-5.8 Analyze the equations of two lines to determine whether the lines are perpendicular or parallel.
Interim Assessment (formative)
- Board work
- Class discussion
- Group activities
- Journals
- Observations
- Question and answer
- Quizzes/Tests

Key Criteria (to meet the standard/rubric)
See Rubric for Stained Glass Window Project
Graph each of the following lines as indicated by your teacher. Draw the lines to the edge of your graph paper. When you are finished, neatly color the sections to make a stained glass window design.

1. \( y = -\frac{1}{2}x - 4 \)
2. \( y = \frac{3}{2}x + 12 \)
3. \( y = 12 \)
4. \( x = 0 \)
5. \( y = \frac{1}{2}x + 4 \)
6. \( y = \frac{1}{2}x - 4 \)
7. \( y = -\frac{1}{2}x + 4 \)
8. \( y = -\frac{3}{2}x + 12 \)
9. \( y = -12 \)
10. \( y = -\frac{3}{2}x - 12 \)
11. \( y = \frac{3}{2}x - 12 \)

Tape/Glue your stained glass window to a sheet of colored construction paper. You will be graded on the accuracy of graphing the lines, and the neatness & creativity of your coloring.
## Stained Glass Window Project

### Mathematical Concepts

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graph shows</td>
<td>complete understanding of the mathematical concepts used to</td>
<td>substantial understanding of the mathematical concepts used to</td>
<td>some understanding of the mathematical concepts needed to</td>
<td>very limited understanding of the underlying concepts needed to</td>
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<tr>
<td>complete the</td>
<td>complete the activity.</td>
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<td>activity.</td>
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### Mathematical Errors

<p>| | | | | |</p>
<table>
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</thead>
<tbody>
<tr>
<td>90-100%</td>
<td>of the lines are graphed correctly.</td>
<td>almost all (85-89%) of the lines are graphed correctly.</td>
<td>most (75-84%) of the lines are graphed correctly.</td>
<td>more than 75% of the lines have errors.</td>
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### Overall appearance of the

|                                               |                                                                 |                                                                  |                                                                  |                                                                  |
|                                               | The lines are straight, and the project is colorful. Creativity  | The lines are straight, and the project is colorful. Creativity  | The lines are straight, but color and creativity are not         | The lines are not straight and color and creativity are not      |
|                                               | is evident.                                                     | is not evident.                                                   | evident.                                                         | evident.                                                         |
|                                               |                                                                  |                                                                  |                                                                  |                                                                  |

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Unit 4