

## STAINED GLASS

**Lesson Description:** Stained Glass Window is a project that requires students to write graph Linear Equations in order to create a colorful display window, while working with mathematics. Each student will write a set of at least 15 linear equations. These equations will be a combination of vertical, horizontal, parallel and perpendicular lines. This visual project will help students identify the equations of horizontal and vertical lines. It will also allow students work with the slopes of parallel and perpendicular lines. Key vocabulary will also be developed.

**Math Content:** Linear Equations, Graphing Linear Equations, Parallel Lines, Perpendicular Lines, Standard Form, Slope, y-intercept.

**Content Objectives:**

- The student will be able to write and graph a set of parallel equations.
- The student will be able to write and graph a set of perpendicular equations.
- The student will be able to write and graph an equation for vertical and horizontal lines.

**Language Objectives:**

- The student will explain how the slopes of parallel lines are related.
- The student will describe the slope of a vertical line.
- The student will describe the slope of a horizontal line.

**Materials:** rulers, graph paper, pencils, colored markers

**Grade Level:** Algebra 2 (college or honors)

**Procedure:** As a class, complete the stained glass window worksheet. Students will need to write and graph linear equations to complement a given set of equations. The combination of both will create a sample stained glass window. Students will write the devised linear equations in Standard Form for homework.

Next, the students will need to write and graph two vertical equations and two horizontal equations to give the dimensions of their window. Then the student will write a series of parallel and perpendicular equations to create a visually pleasing stained glass window. Once the graph is complete, color will be added.

Finally, students will complete a worksheet where each equation necessary to construct the window is written in both  $y = mx + b$  and in Standard Form. The worksheet will require students to label a set of perpendicular equations, a set of parallel equations, vertical equations, and horizontal equations. To complete the project, the student will submit a separate sheet with all vocabulary used in the project.