



Bridging for Math Strength Resources

Standards of Learning Curriculum Framework (SOL)

Bridging Standards of Learning (SOL) for Grade 8

Bridging Standard of Learning (SOL) 8.16d Graph a linear function given the equation in $y = mx + b$ form.



Student Strengths	Bridging Concepts	Standard of Learning
Students can determine the difference between a proportional linear relationship and an additive linear relationship.	Students can graph a line representing a proportional relationship between two quantities given the slope and an ordered pair, or given the equation in $y = mx$ form where m represents the slope as rate of change, Students can graph a line representing an additive relationship between two quantities given the y -intercept and an ordered pair, or given the equation in the form $y = x + b$, where b represents the y -intercept.	Students can, when given the equation of a linear function in the form $y = mx + b$, graph the function.

Understanding the Learning Trajectory

Big Ideas:

- Mathematical rules (relations) can be used to assign members of one set to members of another set. A special rule (function) assigns each member of one set to a unique member of the other set.
- Mathematical relationships can be represented and analyzed using words, tables, graphs, and equations.
- In a linear function of the form $y = mx$, m is the constant of variation and it represents the rate of change of y with respect to x , otherwise known as slope (Charles, 2005)

- Functions of the form $y = mx + b$ are proportional relationships exactly when $b = 0$, so that y is proportional to x . (Achieve the Core)
- The parameters in an equation representing a function affect the graph of the function in predictable ways. (Charles, 2005)

Formative Assessment:

- [Just in Time Mathematics Quick Check 8.16d Word](#)
- [Just in Time Mathematics Quick Check 8.16d PDF](#)
- [Just in Time Mathematics Quick Check 8.16d Desmos](#)

Important Assessment Look Fors:

- The student can identify the slope and y-intercept in the equation.
- The student identifies the value of the y-intercept as the point on the line where the line crosses the y-axis.
- The student can apply rise over run (or change in y over change in x) for the slope starting at the y-intercept to find another point on the line.
- The student can create a table of values to find other points that lie on the line and graph the points.

Purposeful Questions:

- What is the y-intercept of the line? Where would the point be on the graph?
- What is the slope of the line? How do you use the slope to find another point on the line?
- If you create a table of values for the equation, how can you use that to graph the line?

Bridging Activity to Support Standard	Instructional Tips
Routine Number Sense Routines (Henrico)	Slides 11 and 14 would be a good routine for the concept in this SOL.
Rich Tasks Domino Effect	Guiding documents are included. The task is meant for students beginning linear functions that are not proportional by building on prior knowledge.
Games/Tech Khan Academy: Graphing from Slope-Intercept Form Desmos 8.16bd Match My Picture Desmos 8.16bd Match My Line Desmos 8.16bd Land the Plane Desmos 8.16bde Investigating	This quiz game provides quick questions to test one's graphing knowledge. Play with a friend to answer the most each round. This activity is designed to strengthen students' linear graphing skills through a series of "match my picture" challenges. As students work, they use lists in the graphing calculator to look for and make use of structure. In a series of challenges, students must find the equations of several lines on the graph. Students also have an opportunity to learn how to use lists on the Desmos graphing interface. In this activity, students work through a series of scaffolded linear graphing challenges to develop their proficiency with direct variation, slope-intercept, point-slope, and other linear function forms. Students write equations for a series of challenges to get a line to pass through a pair of points. The challenges include equations for direct variations, slope-intercept form, point-slope form, and double-intercept form. In this activity, students practice finding equations of lines in order to land a plane on a runway. Most of the challenges are well-suited to slope-intercept form, but depending on the goals of an individual class or student they are easily adapted to other forms of linear equations. In this activity, students write linear equations in $y = mx + b$ form to compare the cost

T-Shirt Offers Desmos 8.16abde Linear Slalom	of two T-shirt companies. Students then draw connections between the algebraic and graphical solutions, and interpret the results in context. In this activity, students work through a series of slalom-themed challenges to strengthen and stretch their algebraic and graphical understanding of lines. On the graphing challenges, pairs of points represent gates through which the student is to place a line by typing the equation of the line in slope-intercept form. Students are asked to verbalize their understanding of slope and y-intercept in two one reflection and one error analysis problem. Finally, students are asked to create an "impossible challenge" where it is impossible to create a line that passes through a series of gates. Students are able to attempt the challenges created by their classmates on the final slide.
Other Resources: ● VDOE Mathematics Instructional Plans (MIPS) ○ 8.16d - Graphing Linear Functions (Word) / PDF Version ● VDOE Algebra Readiness Formative Assessments ○ SOL 8.16d (Word) / (PDF) ● VDOE Algebra Readiness Remediation Plans ○ Graphing Linear Functions and Matching Representations (Word) / (PDF) ○ Practical Situations Modeled by Linear Functions (Word) / (PDF) ● VDOE Word Wall Cards: Grade 8 (Word) (PDF) ○ Slope – Definition ○ Slope ○ Linear Function ○ Identifying Slope and y-Intercept ○ Connecting Representations ● Desmos Activities ○ Match My Picture ○ Match My Line ○ Land the Plane ○ Investigating T-Shirt Offers ○ Linear Slalom Learning Trajectory Resources: Charles, R. (2005). <u>Big ideas and understandings as the foundation for elementary and middle school mathematics.</u> <i>Journal of Mathematics Education Leadership</i>, 7(3), NCSM. Common Core Standards Writing Team. (2019). Progressions for the Common Core State Standards for Mathematics. Tucson, AZ: Institute for Mathematics and Education, University of Arizona. Van De Walle, J., Karp, K. S., & Bay-Williams, J. M. (2018). <i>Elementary and Middle School Mathematics: Teaching Developmentally.</i> (10th edition) New York: Pearson (2019:9780134802084) VDOE Curriculum Framework for All Grades - Standard of Learning Curriculum Framework (SOL)	