Unit 2 - Expressions and Equations

Content Area: **Mathematics**
Course(s):
Time Period: **November**
Length: **6-8 weeks**
Status: **Published**

Unit Overview

Unit 2 focuses on the Expressions and Equations (EE) domain. The chapters address the following grade 8 standards:

Understand the connections between proportional relationships, lines, and linear equations.

Analyze and solve linear equations and pairs of simultaneous linear equations.

Essential Questions

"What is equivalence?"

"How is the multiplicative inverse used to solve an equation that has a rational coefficient?"

"How can you use the work backward problem-solving strategy to solve a two-step equation?

“Why are graphs helpful?”

"How can you use a table to determine if there is a proportional relationship between two quantities?"

"In any linear relationship, why is the slope always the same?"

"What is the relationship among the unit rate, slope, and constant rate of change of a proportional linear relationship?"

"How does the *y*-intercept appear in these three representations: table, equation, and graph?"

"How can the *x*-intercept and *y*-intercept be used to graph a linear equation?"

"How does using the point-slope form of a linear equation make it easier to write the equation of a line?"

"How can you use a graph to solve a system of equations?"

"How can you solve a system of equations?"

Content

Equations with Rational Coefficients

Two-Step Equations

Equations with Variables on Each Side

Multi-Step Equations

Constant Rate of Change

Slope

Linear Equations

Graph a Line Using Intercepts

Skills

Find the rate of change to distinguish proportional and nonproportional relationships.

Solve multi-step problems involving direct variation.

Find and interpret the slope and x- and y-intercepts when graphing a linear equation for a real-world problem.

Use tables, graphs, and models to represent, analyze, and solve real-world problems related to systems of linear equations.

Solve systems of equations graphically and algebraically.

Assessments

Self-Check Quiz

Chapter Tests

Online Standardized Test Practice

Chapter Project

Teacher Observation

Lessons/Learning Scenarios

Glencoe Math Course 3 Text

Chapter 2 Lessons 1-8

Chapter 3 Lessons 1-8

Standards

CCSS.Math.Content.8.F.A.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
CCSS.Math.Content.8.F.A.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.
CCSS.Math.Content.8.F.B.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
CCSS.Math.Content.8.F.B.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
CCSS.Math.Content.8.EE.B.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.
CCSS.Math.Content.8.EE.B.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.
CCSS.Math.Content.8.EE.C.8.a	Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
CCSS.Math.Content.8.EE.C.8.b	Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.
CCSS.Math.Content.8.EE.C.8.c	Solve real-world and mathematical problems leading to two linear equations in two variables.

Resources

Glencoe Math, Course 3, McGraw-Hill, 2013

First Quadrant Grids Master
graphing calculator
Coordinate Planes Master
motion detectors for graphing calculators
masking tape
meter sticks