

# Learning Targets

## Linear Equations, Inequalities, and Systems

### Lesson 1: Planning a Pizza Party

- I can explain the meaning of the term “constraints.”
- I can tell which quantities in a situation can vary and which ones cannot.
- I can use letters and numbers to write expressions representing the quantities in a situation.

### Lesson 2: Writing Equations to Model Relationships (Part 1)

- I can tell which quantities in a situation can vary and which ones cannot.
- I can use letters and numbers to write equations representing the relationships in a situation.

### Lesson 3: Writing Equations to Model Relationships (Part 2)

- I can use words and equations to describe the patterns I see in a table of values or in a set of calculations.
- When given a description of a situation, I can use representations like diagrams and tables to help make sense of the situation and write equations for it.

### Lesson 4: Equations and Their Solutions

- I can explain what it means for a value or pair of values to be a solution to an equation.
- I can find solutions to equations by reasoning about a situation or by using algebra.

### Lesson 5: Equations and Their Graphs

- I can use graphing technology to graph linear equations and identify solutions to the equations.
- I understand how the coordinates of the points on the graph of a linear equation are related to the equation.
- When given the graph of a linear equation, I can explain the meaning of the points on the graph in terms of the situation it represents.

### Lesson 6: Equivalent Equations

- I can tell whether two expressions are equivalent and explain why or why not.
- I know and can identify the moves that can be made to transform an equation into an equivalent one.
- I understand what it means for two equations to be equivalent, and how equivalent equations can be used to describe the same situation in different ways.

### Lesson 7: Explaining Steps for Rewriting Equations

- I can explain why some algebraic moves create equivalent equations but some do not.
- I know how equivalent equations are related to the steps of solving equations.
- I know what it means for an equation to have no solutions and can recognize such an equation.

### Lesson 8: Which Variable to Solve for? (Part 1)

- Given an equation, I can solve for a particular variable (like height, time, or length) when the equation would be more useful in that form.
- I know the meaning of the phrase “to solve for a variable.”

### Lesson 9: Which Variable to Solve for? (Part 2)

- I can write an equation to describe a situation that involves multiple quantities whose values are not known, and then solve the equation for a particular variable.
- I know how solving for a variable can be used to quickly calculate the values of that variable.

### Lesson 10: Connecting Equations to Graphs (Part 1)

- I can describe the connections between an equation of the form  $ax + by = c$ , the features of its graph, and the rate of change in the situation.
- I can graph a linear equation of the form  $ax + by = c$ .
- I understand that rewriting the equation for a line in different forms can make it easier to find certain kinds of information about the relationship and about the graph.

### **Lesson 11: Connecting Equations to Graphs (Part 2)**

- I can find the slope and vertical intercept of a line with equation  $ax + by = c$ .
- I can take an equation of the form  $ax + by = c$  and rearrange it into the equivalent form  $y = mx + b$ .
- I can use a variety of strategies to find the slope and vertical intercept of the graph of a linear equation given in different forms.

### **Lesson 12: Writing and Graphing Systems of Linear Equations**

- I can explain what we mean by “the solution to a system of linear equations” and can explain how the solution is represented graphically.
- I can explain what we mean when we refer to two equations as a system of equations.
- I can use tables and graphs to solve systems of equations.

### **Lesson 13: Solving Systems by Substitution**

- I can solve systems of equations by substituting a variable or an expression.
- I know more than one way to perform substitution and can decide which way or what to substitute based on how the given equations are written.

### **Lesson 14: Solving Systems by Elimination (Part 1)**

- I can solve systems of equations by adding or subtracting them to eliminate a variable.
- I know that adding or subtracting equations in a system creates a new equation, where one of the solutions to this equation is the solution to the system.

### **Lesson 15: Solving Systems by Elimination (Part 2)**

- I can explain why adding or subtracting two equations that share a solution results in a new equation that also shares the same solution.

### **Lesson 16: Solving Systems by Elimination (Part 3)**

- I can solve systems of equations by multiplying each side of one or both equations by a factor, then adding or subtracting the equations to eliminate a variable.
- I understand that multiplying each side of an equation by a factor creates an equivalent equation whose graph and solutions are the same as that of the original equation.

### **Lesson 17: Systems of Linear Equations and Their Solutions**

- I can tell how many solutions a system has by graphing the equations or by analyzing the parts of the equations and considering how they affect the features of the graphs.
- I know the possibilities for the number of solutions a system of equations could have.

### **Lesson 18: Representing Situations with Inequalities**

- I can write inequalities that represent the constraints in a situation.

### **Lesson 19: Solutions to Inequalities in One Variable**

- I can graph the solution to an inequality in one variable.
- I can solve one-variable inequalities and interpret the solutions in terms of the situation.
- I understand that the solution to an inequality is a range of values (such as  $x > 7$ ) that make the inequality true.

### **Lesson 20: Writing and Solving Inequalities in One Variable**

- I can analyze the structure of an inequality in one variable to help determine if the solution is greater or less than the solution to the related equation.
- I can write and solve inequalities to answer questions about a situation.

### **Lesson 21: Graphing Linear Inequalities in Two Variables (Part 1)**

- Given a two-variable inequality and the graph of the related equation, I can determine which side of the line the solutions to the inequality will fall.
- I can describe the graph that represents the solutions to a linear inequality in two variables.

### **Lesson 22: Graphing Linear Inequalities in Two Variables (Part 2)**

- Given a two-variable inequality that represents a situation, I can interpret points in the coordinate plane and decide if they are solutions to the inequality.
- I can find the solutions to a two-variable inequality by using the graph of a related two-variable equation.
- I can write inequalities to describe the constraints in a situation.

### **Lesson 23: Solving Problems with Inequalities in Two Variables**

- I can use graphing technology to find the solution to a two-variable inequality.
- When given inequalities, graphs, and descriptions that represent the constraints in a situation, I can connect the different representations and interpret them in terms of the situation.

### **Lesson 24: Solutions to Systems of Linear Inequalities in Two Variables**

- I can write a system of inequalities to describe a situation, find the solution by graphing, and interpret points in the solution.
- I know what is meant by "the solutions to a system of inequalities" and can describe the graphs that represent the solutions.
- When given descriptions and graphs that represent two different constraints, I can find values that satisfy each constraint individually, and values that satisfy both constraints at once.

### **Lesson 25: Solving Problems with Systems of Linear Inequalities in Two Variables**

- I can explain how to tell if a point on the boundary of the graph of the solutions to a system of inequalities is a solution or not.

### **Lesson 26: Modeling with Systems of Inequalities in Two Variables**

- I can interpret inequalities and graphs in a mathematical model.
- I know how to choose variables, specify the constraints, and write inequalities to create a mathematical model.