Tools and Topics

Inspiring Connections Course 2, Chapter 8

Spotlight On: Productive Struggle

Can you imagine if people only pursued fields of study where they got things right on the first try? What if athletes decided to quit after their first tough training session? The lessons in this course are designed to promote productive struggle. It is not bad to struggle—it is part of the learning process. Making sure the struggle is productive is the key!

The Big Picture

Growing From

Multiplying and dividing fractions;
Writing one-variable expressions

Working On

Multiplying and dividing rational numbers;
Solving equations and inequalities in one variable

Growing To

Rational expressions;
Solving systems of equations and inequalities

Need Help?

Methods & Meanings boxes are included in the Mathematician's Notebook as reference.

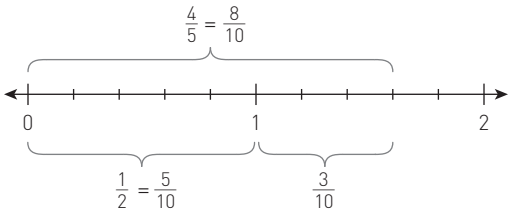
8.1.3: Mixed Numbers and Fractions Greater Than 1
8.1.5: Fraction Division
8.2.1: Inequality Symbols
8.3.2: Using an Equation Mat
8.3.3: Checking a Solution
8.3.4: Solving Problems with a Guess and Check Table
8.3.6: Solving Inequalities and Graphing Inequalities on a Number Line

Current Topics

In this chapter, students will perform multiplication and division of rational numbers. They will also solve equations and inequalities algebraically as well as by comparing expressions using a visual model.

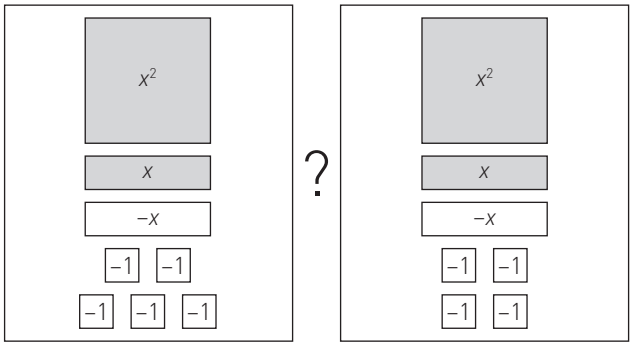
Multiplication and Division of Rational Numbers (Section 8.1)

Students will continue working with rational numbers by multiplying and dividing using number lines. The problem $\frac{4}{5} \div \frac{1}{2}$ can be represented on a number line, as shown.



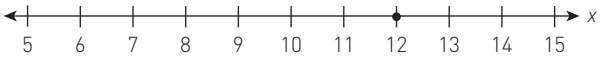
Working With Expressions (Section 8.2)

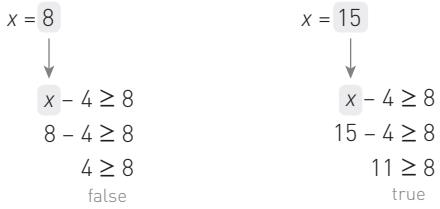
Students will compare expressions visually and determine whether one expression is less than, greater than, or equal to another given expression. In the example, the left side of the Expression Comparison Mat is represented by $x^2 + x + (-x) + (-5)$; and the right expression is $x^2 + x + (-x) + (-4)$. Which one is greater? The expressions on each mat can be reduced to -5 on the left and -4 on the right. Since $-5 < -4$, the relationship between the original expressions can be written as the inequality $x^2 + x + (-x) + (-5) < x^2 + x + (-x) + (-4)$.

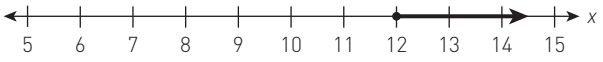


Writing and Solving Equations and Inequalities (Section 8.3)

To solve and graph an inequality with one variable, students treat the problem as if it were an equation and solve for the variable. This solution is called the boundary point. For example, to solve $x - 4 \geq 8$, first solve $x - 4 = 8$. The solution $x = 12$ is the boundary point for the inequality $x - 4 \geq 8$. To graph the inequality, students first test another point to see if the inequality holds true. If it does, then the arrow points towards the point. If it does not hold true, then the arrow points the opposite direction.







Try This at Home!

Working with inequalities is similar to using a balancing scale. To illustrate this, collect several light items and one heavy item and ask your student whether the combined weight of the light items is more or less than the weight of the heavy item.