

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? Society sometimes sends the message that struggling to learn something is bad. Parents and teachers often rescue students when there is any struggle happening. 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

Solving equations with algebra tiles;
Operations with exponents

Working On

Solving equations;
Exponent properties

Growing To

Solving systems of equations algebraically;
Scientific notation

Need Help?

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

4.1.1: Complete Graphs

4.1.2: Exponents

4.2.5: Solutions to an Equation with One Variable

4.3.2: Properties of Exponents

Current Topics

In this chapter, students will explore patterns in exponential notation to generalize properties of exponents and investigate solutions to complex equations. This chapter provides opportunities for students to build on their previous work with Equation Mats.

Exponents, Part 1 (Section 4.1)

In this section, students recognize the need for exponential notation and work to generalize properties of exponents. Along the way, they develop strategies to write equivalent exponential expressions.

$$(5^2)^3 = 5^2 \cdot 5^2 \cdot 5^2$$

Solving Equations (Section 4.2)

In this section, students investigate solutions to complex equations that have one solution, no solutions, or infinitely many solutions. Throughout this section, students will transition from using Equation Mats to representing equations symbolically, without algebra tiles, as they test whether solutions to equations are valid.

$$\text{Step 1: } 2 - 3x - 8\left(\frac{1}{2}x - \frac{1}{2}\right) = 2 - 3 + (x - 1)$$

$$\text{Step 2: } 2 - 3x - 4x + 4 = -1 + x - 1$$

$$\text{Step 3: } 6 - 7x = -2 + x$$

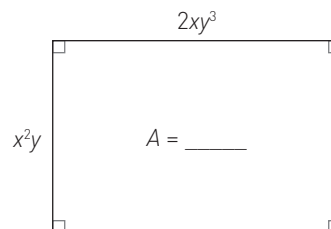
$$\text{Step 4: } 6 - 8x = -2$$

$$\text{Step 5: } -8x = -8$$

$$\text{Step 6: } x = 1$$

Exponents, Part 2 (Section 4.3)

In this section, students use patterns to continue their exploration of properties of exponents and the values of zero and negative exponents. Students will continue to expand their understanding of exponential notation and properties of exponents in Chapter 9, as they work with scientific notation.



Try This at Home!

Give your student two items, such as two coins or two pieces of candy, and ask them how many items they would have if they doubled or tripled the number of items each day for the next 5 days. This is an example of exponential growth, something students will work on this chapter.

