EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In Topic B, students extend their knowledge of **exponents** from Grade 5 as they strengthen their understanding of the related vocabulary (**base**, power, exponent, **cubed**, and **squared**) and move from whole number bases to bases written in fraction and decimal form. After studying exponents, students build on knowledge from Topic A. They learn more about the order of operations and how it is used to **evaluate** various **numerical expressions** by examining operations in terms of how *powerful* they are.

You can expect to see homework that asks your child to do the following:

- Write a number in exponential, expanded, and standard form.
- Explain why a whole number base raised to a whole number exponent gets larger, while a fractional base raised to a whole number exponent gets smaller.
- List all the powers of 3 and 4 that evaluate to any number between 3 and 1,000.
- Describe the advantage of **exponential notation** (rather than a multiplication expression) if all the factors are the same.
- Explain the difference between expressions using their knowledge of exponents. For example, $3x$ and x^3 are different because if x has a value of 2, the value of $3x$ is $3(2)$, or 6, and the value of x^3 is $2 \times 2 \times 2$, or 8.
- Evaluate an expression using the order of operations.

SAMPLE PROBLEM *(From Lesson 6)*

Evaluate using the order of operations.

$2^4 \cdot (13 + 5 - 14 \div (3 + 4))$

$2^4 \cdot (13 + 5 - 14 \div 7)$

$2^4 \cdot (13 + 5 - 2)$

$2^4 \cdot 16$

$16 \cdot 16$

256

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

You can help at home in many ways. Here are some tips to help you get started.

- With your child, evaluate the following expressions (find the answer): $(5 + 3^2) \div (3 + 4)$ and $5 + 3^2 \div 3 + 4$. Discuss why the answers are different. (They are different because of the parentheses. The first expression has a value of 2, and the second expression has a value of 12. It is important to pay attention to the placement of the parentheses.)
- Jeremy thinks 2^4 is equal to 8. Suzie thinks the answer is 16. Discuss with your child who is correct and why. (Suzie is correct because the exponent tells how many times the base is multiplied by itself, $2 \times 2 \times 2 \times 2$. The exponent and base should not be multiplied by each other. Jeremy's error is a very common mistake, so make sure your child understands and can articulate the error.)
- Where can the parentheses be placed so the expression $28 - 3 \times 3 + 4$ has a value of 7? (Around the $3 + 4$) Where can the parentheses be placed so the same expression has a value of 79? (Around the $28 - 3$) Tyler added an exponent to a term, and now the expression (with no parentheses) has a value of 35. Where did Tyler put the exponent? (He changed 4 to 4^2.)

TERMS

Algebraic expression: An expression containing numbers, variables, and operators (such as + and −) that represents a single value and does not contain equal signs or inequality symbols (e.g., $2m$ or $9a + 3$).

Base: In the term y^6, the y is the base, or repeating factor, and may be a variable or a number.

Cubed: When a base is raised to the third power. For example, 5^3 can be read as *five cubed*.

Evaluate: To evaluate an expression means to find the answer.

Exponential notation for whole number exponents: A way to write numbers using exponents. For example, the number 3,125 (standard form) can be written as $5 \times 5 \times 5 \times 5 \times 5$ (expanded form) or 5^5 (exponential form). It provides a simpler alternative to expanded form when indicating that a number should be multiplied by itself repeatedly. We can read 5^5 as *five to the fifth power*.

Exponent: In the term $3y^6$, the 6 is the exponent. The exponent tells you how many times to use the base (y) as a factor.

Numerical expression: A group of numbers, symbols, and operators (such as + and −) that represents a single value and does not contain equal signs or inequality symbols (e.g., 2×4 or $9(5 + 1)$).

Squared: When a base is raised to the second power. For example, 5^2 can be read as *five squared*.

Value of a numerical expression: The number found by evaluating the expression, or, in other words, by simplifying the expression to a single value. For example, the value of the expression 3×8 is 24.