

"I Can" Help My Student

- I can recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left. (5.NBT.1)
- I can explain patterns in the number of zeros of the product when multiplying a number by powers of 10. (5.NBT.2)
- I can fluently multiply multi-digit whole numbers using the standard algorithm. (5.NBT.5)
- I can find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors. (5.NBT.6)
- I can use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. (5.OA.1)
- I can write simple expressions that record calculations with numbers. (5.OA.2)

Words to Know

exponent: the number that tells the number of times the base is multiplied by itself.

decimal: a number with one or more digits to the right of the decimal point; used as another name for decimal fraction.

digit: any of the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9 that make up a number.

place value: the value of the place of a digit in a number.

powers of 10: using a base number of 10 with an exponent; our number system is based on the powers of 10.

product: the result of multiplication.

whole number: 0 and the counting numbers 1,2,3,4,5,6, and so on; if a number has a negative sign (-), a decimal point (.), or a part that is a fraction ($\frac{2}{3}$), it is NOT a whole number.

area models: model of multiplication that shows each place value product.

dividend: a quantity to be divided.

divisor: quantity by which another quantity is divided.

estimate: number close to an exact amount, tells *about* how much.

quotient: result of division.

rectangular arrays: arrangement of objects in rows.

braces: a type of grouping symbol that can be used to indicate that the objects written between them belong to a set. { }

brackets: a type of grouping symbol used in pairs that tells what operation to complete first. []

evaluate: to find the value of a mathematical expression.

exponents: the number that tells the number of times the base is multiplied by itself. (In 10^3 , 3 is the exponent.)

numerical expression: a combination of numbers and symbols that represents a mathematical relationship.

parentheses: grouping symbols for operations. When simplifying an expression, the operations within the parentheses are performed first. ()

Important Understandings and Concepts

What should my student already know before I begin...

- Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form
- Use place value understanding to round multi-digit whole numbers to any place
- Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers

Learning at a Glance

5th grade students should understand the use of whole number exponents to denote powers of 10. Students understand why multiplying by a power of 10 shifts the digits of a whole number or decimal that many places to the left.

Powers of 10			
Power of 10	Standard Form	Fractional Form	Place Value
10^4	10,000	$\frac{10,000}{1}$	ten thousands
10^3	1,000	$\frac{1,000}{1}$	thousands
10^2	100	$\frac{100}{1}$	hundreds
10^1	10	$\frac{10}{1}$	tens
10^0	1	$\frac{1}{1}$	ones

Example: $10^2 = 10 \times 10 = 100$

Example: $10^3 = 10 \times 10 \times 10 = 1,000$

Example: $10^4 = 10 \times 10 \times 10 \times 10 = 10,000$

Some teachers use the following hopscotch graphic organizer with their students who can benefit from a kinesthetic connection with the order of operations. Landing on the D and M and the A and S with both feet helps students to understand the order of operations. In this graphic, the "B" stands for braces and brackets. Some teachers like using a "G" here to stand for "grouping symbols".



How Can You Help Your Student?

Interactive Learning Lessons

Your student can watch the videos alone or with you. Have your student take notes while watching. Allow them to watch as many times as needed.

Learn Zillion – [Recognizing the Value of Digits in a Multi-Digit Number](#)

Learn Zillion – [Explaining Patterns in Zeros When Multiplying and Dividing by Powers of 10](#)

Learn Zillion – [Multiply Multi-digit Whole Numbers using the Standard Algorithm](#)

Learn Zillion – [Find Whole Number Quotients with up to 4-digit Dividends and 2-digit Divisors](#)

Interactive Learning Games

[Math Snacks-Gate Beta](#) explore place value

[Place Values and Number Sense](#) convert between place values

[Creating and Solving a Division Problem](#)

[Multiplication Rap](#) youtube video

[Multiplication Quick Tricks](#)

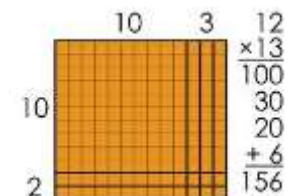
Playing games is a wonderful way to practice skills at home in a fun environment. *Stack-n-Pack* books contain several math games covering math concepts from Kindergarten through High School. *Stack-n-Pack* card games may be checked out from your school (contact your school's Parent Liaison) or purchased online: [Stack-n-Pack Mathematics Card Games for K-HS](#)

Game: **Equivalent Fractions**



Sample Problems and Other Resources

12 x 13 (Area Model with partial product recording)



The partial quotient method can then be related to the standard algorithm as shown below.

Step 1	Step 2	Step 3
500 12)6324 6000 324	20 500 12)6324 6000 324 240 84	7 20 500 12)6324 6000 324 240 84 84
Conclusion: 6324 ÷ 12 = 527		

Example: $3\{2 + 5 [5 + 2 \times 10^2] + 3\}$

First examine your grouping symbols (parentheses, braces, brackets) and solve from the inside out. This is a good example of making the choice to find the exponent after identifying the first grouping symbol to be evaluated.

$$3\{2 + 5 [5 + 2 \times 10^2] + 3\} \rightarrow 3\{2 + 5 [5 + 2 \times 100] + 3\} \rightarrow 3\{2 + 5 [5 + 200] + 3\} \rightarrow 3\{2 + 5 [205] + 3\} \rightarrow$$

$$3\{2 + 1025 + 3\} \rightarrow 3\{1030\} \rightarrow 3,090$$

Recommended Children's Literature

The use of children's literature is equally important as problems and deserves some attention. Use these books to integrate and enhance both language literacy and mathematical literacy for an interdisciplinary connection during story time. *These books can be checked out at your local Atlanta-Fulton Public Library System www.afplweb.com*