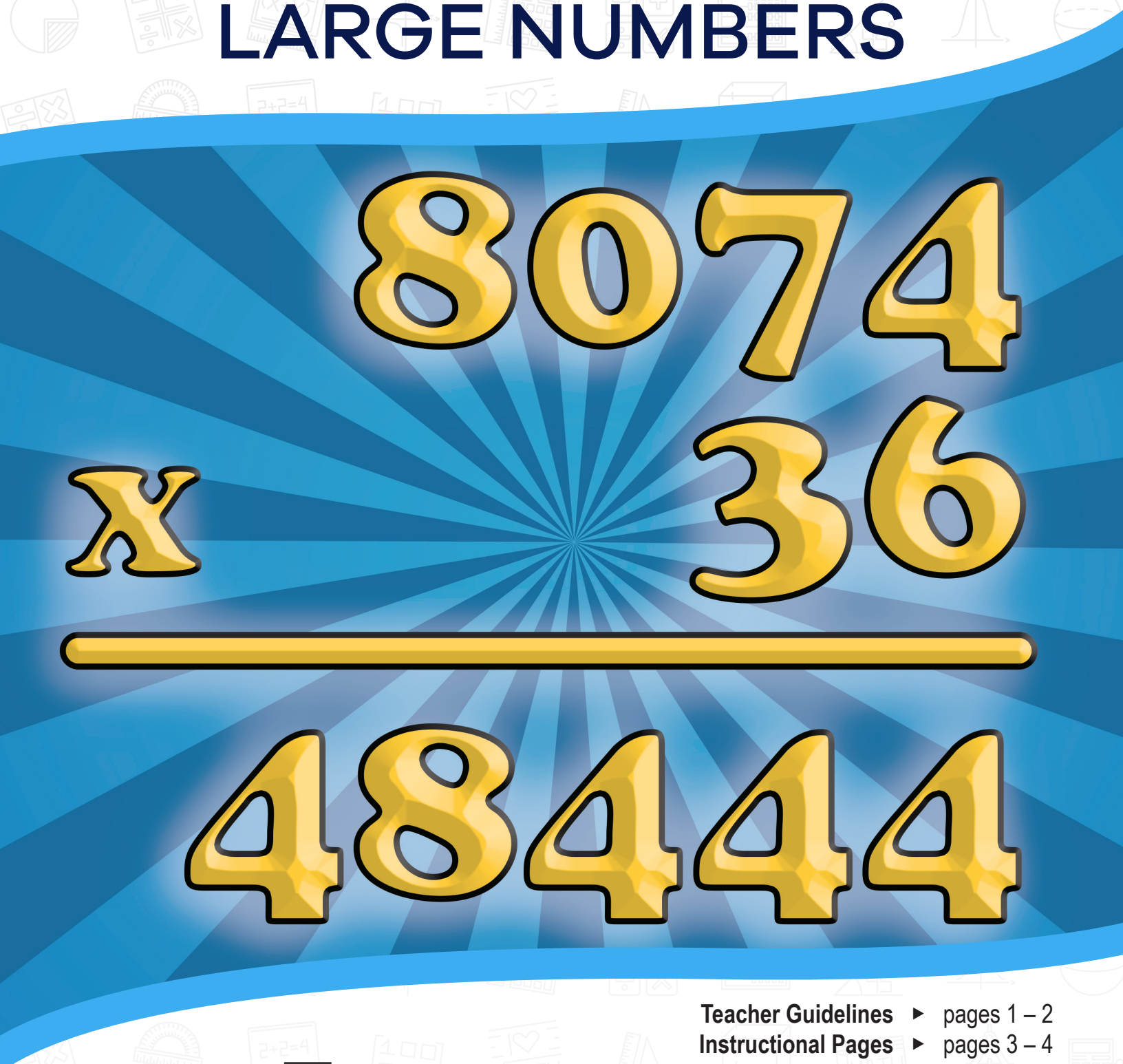
Learn BRIGHT

MULTIPLICATION OF LARGE NUMBERS



GRADE 5

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Classroom Procedure:

1. Begin by reviewing some basic single-digit multiplication facts.
2. While reading the content pages, reinforce vocabulary, and give students additional examples of large number multiplication problems to help them practice. Use the additional resources to enhance understanding.
3. Introduce notes on the Multiplication of Large Numbers. Have students practice problems and walk through the algorithm.
4. Follow the Activity page with students. Give each student a blank index card and ask them to write a number on the card. Provide students with parameters for their number, such as it must be between 2 and 4 digits, it can not have more than one zero, etc. Collect the cards and shuffle them. Pick two cards and have students multiply the numbers.
5. Distribute the Practice page. Check and review the students' responses as a class.
6. Distribute the Homework page. Have students work a few problems at the beginning of the next class to reinforce their understanding.
7. In closing, ask students to think about how computers and calculators solve huge multiplication problems. Allow for responses and discussion.

Lesson Title:
Multiplication of Large Numbers

Subject: Math

Approximate Grade Level: 5

Objectives: Students will be able to fluently multiply multi-digit whole numbers using the standard algorithm.

State Educational Standards*
LB.Math.Content.5.NBT.B.5

Class Sessions (*45 minutes*): 1

Teaching Materials/Worksheets:

Multiplication of Large Numbers content pages
Activity pages
Practice page
Homework page

Student Supplies:
Index cards
Markers (optional)

Prepare Ahead of Time:
Copy Materials

Options for Lesson:
Use this lesson as an opportunity to allow students to check their work using a calculator. This is also an excellent lesson to reinforce the commutative property of multiplication. Have students use the commutative property and a calculator to check their work. Put students in small groups with different multiplication parameters to allow for differentiation.

*Lessons are aligned to meet the education objectives and goals of most states. For more information on your state objectives, contact your local Board of Education or Department of Education in your state.

Teacher Notes

This lesson focuses on using the multiplication algorithm to teach students to multiply large numbers. Examples are provided for the teacher to do along with the students, including step by step instructions.

Multiplication of Large Numbers

Multiplying large numbers may look confusing at first. Still, with a little practice, you will be able to multiply any two large numbers using an algorithm. An algorithm is a mathematical pattern that you follow each time to find a solution. Let's jump in and start multiplying!

Before you begin – here are two quick tips:

1. Always write the number with the most digits on top of the other number, but if they have an equal amount of digits, it doesn't matter which one goes on top.

2. Line up the last digits when writing the two numbers.

EXAMPLE 1

8074 → has four digits
x 36 → has two digits

Begin by multiplying the top number by the unit digit in the bottom number. In this example, it would be 8074 x 6 and write the product under the line. Make sure to keep your numbers lined up nicely!

8074
x 36
48444

Next, multiply the top number by the tens digit in the bottom number. In this example, it would be 8074 x 3 and write the product under the line.

8074
x 36
48444
242220

Did you notice that there is a bright green '0' in the answer? This is called a place holder. If you are multiplying by a digit in the tens, you add 1 place holder to the answer, if you are multiplying by a digit in the hundreds, you add 2 place holders to the answer. Guess how many place holders you would add if you were multiplying by a digit in the thousands position? That's right – 3 placeholders!

The last step is to add up the rows to find the final product.

8074
x 36
48,444
+ 242,220
290,664

EXAMPLE 2

Let's look at another example using this algorithm.

$$\begin{array}{r} 451 \\ \times\ 278 \\ \hline \end{array}$$

Have an equal number of digits so either number could be on top

Begin by multiplying the top number by the unit digit in the bottom number.

$$\begin{array}{r} 451 \\ \times\ 278 \\ \hline 3608 \end{array}$$

Next, multiply the top number by the tens digit in the bottom number.

$$\begin{array}{r} 451 \\ \times\ 278 \\ \hline 3608 \\ 3157 \end{array}$$

Next, multiply the top number by the tens digit in the bottom number.

$$\begin{array}{r} 451 \\ \times\ 278 \\ \hline \\ 3608 \\ 31570 \\ 90200 \end{array}$$

The last step is to add up the rows to find the final product.

$$\begin{array}{r} 451 \\ \times\ 278 \\ \hline 3608 \\ +\ 31570 \\ 90200 \\ \hline 125378 \end{array}$$

Activity Name _____ Date _____

Instructions

Write down the two numbers from the cards and multiply in the space provided.

Activity Name Answer Key (may vary) Date _____

Instructions

Arrange the numbers and then multiply using the standard algorithm.

Answers will vary	

Practice

Name _____ Date _____

Instructions

Arrange the numbers and then multiply using the standard algorithm.

1166 x 31	62 x 315	796 x 9722
363 x 458	2764 x 4212	91 x 326
125 x 523	7137 x 3180	39 x 1445

Practice Name Answer Key Date _____

Instructions

Arrange the numbers and then multiply using the standard algorithm.

1166 x 31 36,146	62 x 315 19,530	796 x 9722 7,738,712
363 x 458 166,254	2764 x 4212 11,641,968	91 x 326 29,666
125 x 523 65,375	7137 x 3180 22,695,660	39 x 1445 56,355

Homework

Name _____ Date _____

Instructions

Arrange the numbers and then multiply using the standard algorithm.

230 x 2357	277 x 52	32 x 2319
1355 x 208	154 x 804	1962 x 4857
87 x 2116	3165 x 668	483 x 54

Homework

Name Answer Key Date _____

Instructions

Arrange the numbers and then multiply using the standard algorithm.

230 x 2357 542,110	277 x 52 14,404	32 x 2319 74,208
1355 x 208 281,840	154 x 804 123,816	1962 x 4857 9,529,434
87 x 2116 184,092	3165 x 668 2,114,220	483 x 54 26,082