#10141
BASIC MATH: MULTIPLYING INTEGERS

CEREBELLUM CORPORATION, 2001
Grade Level: 7-12
9 mins.
2 Instructional Graphics Enclosed

DESCRIPTION

Defines basic multiplication terms and demonstrates how to multiply positive and negative integers. Explains in detail multiplying large numbers and uses many examples for clarification. Standard Deviants School.

ACADEMIC STANDARDS

Subject Area: Mathematics

- Standard: Understands and applies basic and advanced properties of the concepts of numbers
  - Benchmark: Understands basic number theory concepts (e.g., prime and composite numbers, factors, multiples, odd and even numbers, divisibility) (See INSTRUCTIONAL GOALS 1.)
  - Benchmark: Understands the role of positive and negative integers in the number system (See INSTRUCTIONAL GOALS 2.)
  - Benchmark: Understands the basic meaning of place value (See INSTRUCTIONAL GOALS 4.)
  - Benchmark: Uses models (e.g., number lines, two-dimensional and three-dimensional regions) to identify, order, and compare numbers (See INSTRUCTIONAL GOALS 3.)
- Standard: Uses basic and advanced procedures while performing the processes of computation
  - Benchmark: Adds, subtracts, multiplies, and divides whole numbers, fractions, decimals, integers, and rational numbers (See INSTRUCTIONAL GOALS 1 and 4.)

INSTRUCTIONAL GOALS

1. To define *multiplication* as an extension of addition.
2. To explain the rules that determine if a product is positive or negative based on the signs of the mutipliers.
3. To identify a multiplication table as a tool for finding products of integers from 0 to 12.
4. To demonstrate the steps in multiplying larger numbers.

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VOCABULARY

1. addition
2. arranged
3. carrying
4. column
5. digits
6. equals
7. extension
8. hundreds place
9. integers
10. multiply
11. negative
12. positive
13. product
14. result
15. tens place
16. thousands place
17. units place

BEFORE SHOWING

1. Write "5 + 5 + 5 + 5 =" on the board. Ask what the answer is. Then write "5 x 4 =" on the board. Ask what the answer is. Explain that multiplication is just repeated addition.
2. Present a multiplication word problem.
   a. Example: Lucy Slowe works part-time at the mall. She makes $8 per hour. She works 10 hours a week. How much money has Lucy earned in 5 weeks?
   b. Give students time to solve the problem. Do not tell them the correct answer until after the video.
3. Copy and distribute the "Multiplying Integers Viewing Guide." Encourage students to follow along on the guide with the video. (See INSTRUCTIONAL GRAPHICS.)

DURING SHOWING

1. View the video more than once, with one showing uninterrupted.
2. Pause after the explanation that multiplication is an extension of addition. Clarify the meaning. Do further examples if necessary.
3. Pause after the rules about multiplying positive and negative numbers.
   a. Point out that these rules are at the top of the viewing guide.
   b. Clarify any issues related to the rules.
   c. Write several examples of multiplication problems involving negative and positive numbers. Practice determining if the answers will be positive or negative.
4. Pause during the example of multiplying larger numbers (i.e., 186 x 23).
   a. Pause after completing 3 x 186. Check to be sure that all students understand this step, including carrying. Clarify with more examples if necessary.
   b. Pause after the explanation about putting a zero in the units place before starting to multiply by 2. Add that the 2 is really 20. Clarify with further examples if needed.
   c. Pause after the problem is completed. Emphasize the addition of the two results. (Note: No + sign is shown in the video or on the viewing guide.)

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AFTER SHOWING

Discussion Items and Questions

1. Explain how multiplication is just an extension of addition.
2. Restate the rules for multiplying positive and negative numbers in your own words.
3. What is the answer or solution called in a multiplication problem?
4. Explain the steps in the multiplication of large numbers.

Applications and Activities

1. Review the information from the video using the viewing guide.
2. Complete the "Multiplying Integers: Check Your Knowledge" worksheet. (See INSTRUCTIONAL GRAPHICS.)
3. In small groups or pairs, write original word problems for multiplication. Exchange problems with another group and solve.
4. Copy a blank multiplication grid on card stock. Make individual multiplication tables. Keep in student notebooks as a reference.
5. Model multiplication as repetitive addition using ones, tens, and hundreds blocks.
6. Using a blank multiplication table, play a BINGO-like game.
   a. Roll two dice, and multiply their values.
   b. Write the product on the corresponding square on the grid.
   c. The first person to fill in a row or column of answers wins the game.
7. Play a variation of the card game WAR to practice addition.
   a. Use a regular deck of playing cards. Assign values to the face cards (J = 11, Q = 12, and K = 13 or 0) or remove them.
   b. Each pair of students deals the cards as if playing WAR–the whole deck evenly. Students do not look at the cards.
   c. Each player flips up two cards and multiplies the two numbers announcing the answer to their partner.
   d. The player with the largest product wins the trick. If the students disagree on an answer, the teacher can be the referee.
   e. Play for a set time and the player with the most cards wins, or play until one player possesses *all* the cards.
   f. To make the game more complex, identify one color of cards as negative and the other as positive. Play the game the same way.

CMP RELATED RESOURCES

- *Ace Math for Kids: Volume II, Part 1* #3556
- *Ace Math for Kids: Volume II, Part 3* #3558
- *Basic Math: Dividing Integers* #10137
- *Basic Math: Integers and Addition* #10139
- *Basic Math: Subtracting Integers* #10143
- *Integer Operations: Into the Negative Zone! Part 2: Multiplying and Dividing* #9934

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World Wide Web

The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and "kid safe" sites. However, teachers should preview them before use. The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

- **MULTIPLYING AND DIVIDING INTEGERS**

http://www.math.com/school/subject1/lessons/S1U1L12GL.html

Multiple-page Web site with explanations of multiplying and dividing positive and negative integers. Also has an interactive "workout" of online multiplication problems.

- **MODELING MULTIPLICATION**

http://www.harcourtschool.com/activity/elab2002/grade_3/013.html

Use this interactive model to multiply a one-digit number times a one- or two-digit number. Shows ones, tens, and hundreds blocks, including regrouping.

- **MULTIPLICATION TABLE APPLET**

http://www.netrover.com/~kingskid/MulTab/Applet.html

Use this applet to show the arrays created by a multiplication problem. Click on a number button in the first column and another button in the first row of the table. Next, click the equality sign button "=" in the right upper corner of the table. The result appears as a last number in both last column and last row of the table. Simultaneously the initially white squares in the corresponding rows and columns turn yellow, creating a rectangle array.

- **AAA MATH: MULTIPLICATION** http://www.aaamath.com/B/mul.htm

Find a whole range of multiplication activities, each with an explanation, interactive practice, and games

- **MATH FORUM: ASK DR. MATH** http://forum.swarthmore.edu/dr.math/

"Ask Dr. Math" allows users to e-mail questions to Dr. Math and access archived material. For other materials that relate to this media, click on "Elementary" and then "Multiplication," or choose "Middle School," then "Negative Numbers" or "Word Problems."

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- **MULTIPLICATION WITH INTEGERS**

http://www.quia.com/jg/32578.html

Play any one of the three different games to practice multiplying with two integers.

INSTRUCTIONAL GRAPHICS

- MULTIPLYING INTEGERS: VIEWING GUIDE
- MULTIPLYING INTEGERS: CHECK YOUR KNOWLEDGE

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Multiplying Integers: Viewing Guide

Rules for Multiplying Positive and Negative Integers

If both numbers are positive, then your product is positive.	**(+4) x (+6) = +24**
Anytime you multiply a negative and a positive number, you will have a negative product.	**(+4) x (-6) = -24**
If both of the numbers are negative, then your product is positive.	**(-4) x (-6) = +24**

Multiplying Basics

- Multiplication is simply an extension of addition.

5 + 5 + 5 = 15
5 x 3 = 15

P***roduct:*** The answer to any multiplication problem.

5 x 3 = ***15***

Multiplication table: The product of multiplying small integers.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100

Multiplying Large Numbers

1. Multiply the digit at the far right of the bottom number by every digit of the top number.
2. Carry over if necessary.
3. Insert zeroes for each result where appropriate.
4. **Remember** to keep the digit places lined up.

example:
186
x 23

a. 186
x 23
8

b. 186
x 23
58

c. 186
x 23
558

d. 186
x 23
558
0

e. 186
x 23
558
20

f. 186
x 23
558
3720

g. 186
x 23
558
3720
4278 ← **FINAL ANSWER**

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Multiplying Integers: Check Your Knowledge

Total Score / 50

A. Are You Positive?

Circle the correct answer for each of the following statements (1 point each).

1. The answer to a multiplication problem is called the . . .

   a) sum. b) dividend. c) product. d) multiplication tables.

2. Multiplication is simply an extension of . . .

   a) subtraction. b) addition. c) both a and b. d) none of the above.

3. If you multiply a negative number by a positive number you get a . . .

   a) negative number. b) positive number. c) dividend. d) sum.

4. If you multiply two negative numbers you get a . . .

   a) negative number. b) positive number. c) sum. d) none of the above.

B. Word Problems

Solve the word problems (5 points each).

1. The Standard Deviants' amateur golf team has 5 golfers that are each -6 on their rounds for the day. What is the team score?

2. Trey loses his allowance each week that he doesn't take out the trash. Trey's allowance is $20 a week. If Trey hasn't done his chores in 8 weeks, how much money has he lost?

C. "M" is for Multiplication!

Solve the following problems (2 points each).

1. (-6) x (-2) = _____
2. (-3) x 5 = _____
3. 3 x (-4) = _____
4. 1 x (-4) = _____
5. (-8) x (-4) = _____
6. (-2) x 3 x (-4) = _____
7. (-1) x (-1) = _____
8. (-3) x (-3) x (-7) = _____
9. 5 x (-6) = _____
10. 3 x 2 = _____
11. (-12) x (-3) = _____
12. 6 x (-10) = _____
13. (-24) x 11 = _____
14. (-6) x (-6) x (-6) = _____
15. (-2) x 0 = _____
16. (-7) x 5 = _____
17. 8 x 5 = _____
18. 12 x 0 = _____

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Multiplying Integers: Check Your Knowledge

Answer Key

Total Score / 50

A. Are You Positive?

Circle the correct answer for each of the following statements (1 point each).

1. The answer to a multiplication problem is called the . . .

   a) sum. b) dividend. **c) product.** d) multiplication tables.

2. Multiplication is simply an extension of . . .

   a) subtraction. **b) addition.** c) both a and b. d) none of the above.

3. If you multiply a negative number by a positive number you get a . . .

   a) negative number. b) positive number. c) dividend. d) sum.

4. If you multiply two negative numbers you get a . . .

   a) negative number. **b) positive number.** c) sum. d) none of the above.

B. Word Problems

Solve the word problems (5 points each).

1. The Standard Deviants' amateur golf team has 5 golfers that are each -6 on their rounds for the day. What is the team score?

   5 x (-6) = -30

2. Trey loses his allowance each week that he doesn't take out the trash. Trey's allowance is $20 a week. If Trey hasn't done his chores in 8 weeks, how much money has he lost?

   20 x 8 = $160

C. "M" is for Multiplication!

Solve the following problems (2 points each).

1. (-6) x (-2) = **12**
2. (-3) x 5 = **-15**
3. 3 x (-4) = **-12**
4. 1 x (-4) = **-4**
5. (-8) x (-4) = **32**
6. (-2) x 3 x (-4) = **24**
7. (-1) x (-1) = **1**
8. (-3) x (-3) x (-7) = **-63**
9. 5 x (-6) = **-30**
10. 3 x 2 = **6**
11. (-12) x (-3) = **36**
12. 6 x (-10) = **-60**
13. (-24) x 11 = **-264**
14. (-6) x (-6) x (-6) = **-216**
15. (-2) x 0 = **0**
16. (-7) x 5 = **-35**
17. 8 x 5 = **40**
18. 12 x 0 = **0**

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