**CFS for top quality work**

* + Expressions are written to represent situations **in context**
	+ Sign of the product is **labeled** on the expression
	+ All computation is shown
	+ Final product is **clearly labeled**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

UNIT 2 LESSON 3

**AIM**: SWBAT develop and apply the rules for multiplying two or more integers fluently

**THINK ABOUT IT!**

Fill in each box in the grid below by determining the product of the two numbers the box is in line with. For example, the -20 in the upper left corner is in line with the 5 and the -4. The product of 5 and -4 is -20. Three other examples have been provided for you.



The 6 is in line with the 2 and the 3. 2 x 3 = 6

The -8 is in line with the 2 and the -4. 2 x (-4) = -8

The 3 is in line with the -3 and the -1. -3 x (-1) = 3

When you finish, what do you notice about the completed grid?

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Test the Conjecture #1) Evaluate the two expressions:

-23 x 11 -14 x (-30)

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	+ Final product is **clearly labeled**

Test the Conjecture #2) Will the product of the following expression be positive or negative?

-4 x 18 x (-112) x (-42)

**CFS for top quality work**

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	+ All computation is shown
	+ Final product is **clearly labeled**

Conjecture

|  |
| --- |
| The product of two numbers is positive if the signs are the \_\_\_\_\_\_\_\_ and negative if the signs are \_\_\_\_\_\_\_\_\_\_\_ |

**PARTNER PRACTICE**

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| *Bachelor Level* |

1. Evaluate the following expressions:
	1. 5 x (-9)

**CFS for top quality work**

* + Expressions are written to represent situations **in context**
	+ Sign of the product is **labeled** on the expression
	+ All computation is shown
	+ Final product is **clearly labeled**
	1. -8 x 7
	2. -7 x (-4)
	3. 11 x 10
	4. -4 x (-5) x (-1)
1. Will the product of -3 x (-4) x 7 be positive or negative? Explain your answer.

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| *Master Level* |

1. What will the sign of the product be for the expression? Explain: -2.4 x –½ x 9 x -9.53 x -2 ¾

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1. Evaluate the expression (-5) x (-3) x (-1) x (-2) x 4 x 1 x (-1)

**INDEPENDENT PRACTICE**

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| *Bachelor Level* |

1. Evaluate the following expressions:

**CFS for top quality work**

* + Expressions are written to represent situations **in context**
	+ Sign of the product is **labeled** on the expression
	+ All computation is shown
	+ Final product is **clearly labeled**
	1. -8 x 9
	2. -12 x (-4)
	3. 4(-11)
	4. (-5)(-12)
1. Will the expression -4 x (-6) x (-12) be positive or negative? Explain your reasoning.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Evaluate the expression in question 2.

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| *Master Level* |

1. Predict the sign of the product for each problem below, explain how you determined the correct sign and find the product.
2. -4 x (-5) x (-8) x (-9)

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Product: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. 4 x (-15) x 9 x (-5) x 5

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Product: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Circle all the expressions that will result in a product of -24
	1. -1 x (-24) x (-1)
	2. 6 x (-2) x 2 x (-2)
	3. -6 x (-2) x 2 x (-2)
	4. -3 x 4 x (-2)
	5. -1(4)(-2)(3)
	6. -2(-2)(-2)(-3)(-1)(-1)
2. For all the expressions in number 6 that did not have a product of -24, rewrite the expression so that the product is -24.
3. The product of two numbers is -100. One of the factors is less than 10 and more than 0. What are two possibilities of the factors? Explain your answer

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1. Jonathan says that the expression -5 x (-3) x (-7) has a positive product because the signs of the factors are all the same. Do you agree with him? If so, evaluate the expression. If not, explain why he is incorrect.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| *PhD Level* |

1. Complete the statements with one of the options provided. Be prepared to justify your response.

If a > 0 and b < 0, ab will \_\_\_\_\_\_\_\_\_\_\_\_\_\_ be positive.

1. always b) sometimes c) never d) need more info

If a > 0 and b > 0, ab will \_\_\_\_\_\_\_\_\_\_\_\_\_\_ be positive.

1. always b) sometimes c) never d) need more info

If a < 0 and b < 0, ab will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ be positive.

1. always b) sometimes c) never d) need more info

If a > 0 and b < 0, the sum of a and b will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ be positive.

1. always b) sometimes c) never d) need more info

If a > 0 and b < 0, the product abab will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. positive b) negative c) 0 d) need more info
2. Explain your reasoning for the last expression of the previous question.

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1. Determine a generalized rule that will determine the sign of a multipliation expression with a certain number of negative integers.

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**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**EXIT TICKET**

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| Self-assessment | I mastered the learning objective today. | I am almost there.  | Need more practice and feedback. |
| Teacher feedback | You mastered the learning objective today. | You are almost there.  | You need more practice and feedback. |

1. Simplify each expression below.

**CFS for top quality work**

* + Expressions are written to represent situations **in context**
	+ Sign of the product is **labeled** on the expression
	+ All computation is shown
	+ Final product is **clearly labeled**
	1. $34×\left(-8\right)$
	2. $-12×\left(-19\right)$
1. What will the sign of the product of the expression below be? Justify your answer.

 (-5) x 22 x 18 x (-4) x (-27) x (-41)

a) positive

b) negative

c) no sign – the answer is 0

d) unable to determine – need more info

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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