Lesson 2.3 Multiplying and Dividing Integers (Day 2)

Objective

- Multiply and divide integers by referring to tic-tac-toe and integer posters.

- **Common Core State Standards***7.NS.1*
- **Mathematical Practices** 2. Reason 4. Model mathematics. 5. Use tools strategically. 6. Attend to precision.7. Look for and use structures

Division is the inverse (or reverse) of multiplication.

Multiplication	Division
$3(5) = 15$	$15 \div 5 = 3$
$3(-5) = -15$	$-15 \div (-5) = 3$
$(-3)5 = -15$	$-15 \div 5 = -3$
$(-3)(-5) = 15$	$15 \div (-5) = -3$

For the relationship between multiplication and division, you can conclude the following:

When you divide two integers with the same sign, the quotient is positive.

For example, $2 \div 3 = \frac{2}{3}$ and $-2 \div (-3) = \frac{2}{3}$.

When you divide two integers with different signs, the quotient is negative.

For example, $-2 \div 3 = -\frac{2}{3}$ and $2 \div (-3) = -\frac{2}{3}$.

P	N	N
N	P	N
N	N	P

Multiplying and Dividing

+ ÷ + = +

− ÷ − = +

− ÷ + = −

+ ÷ − = −

Multiplying Integers

If the signs are the same...

- Multiply and the product is positive
  $^{+}5 \times {}^{+}2 = {}^{+}10$ or $^{-}5 \times {}^{-}2 = {}^{+}10$

If the signs are different...

- Multiply and the product is negative
  $^{+}5 \times {}^{-}2 = {}^{-}10$ or $^{-}5 \times {}^{+}2 = {}^{-}10$

Dividing Integers

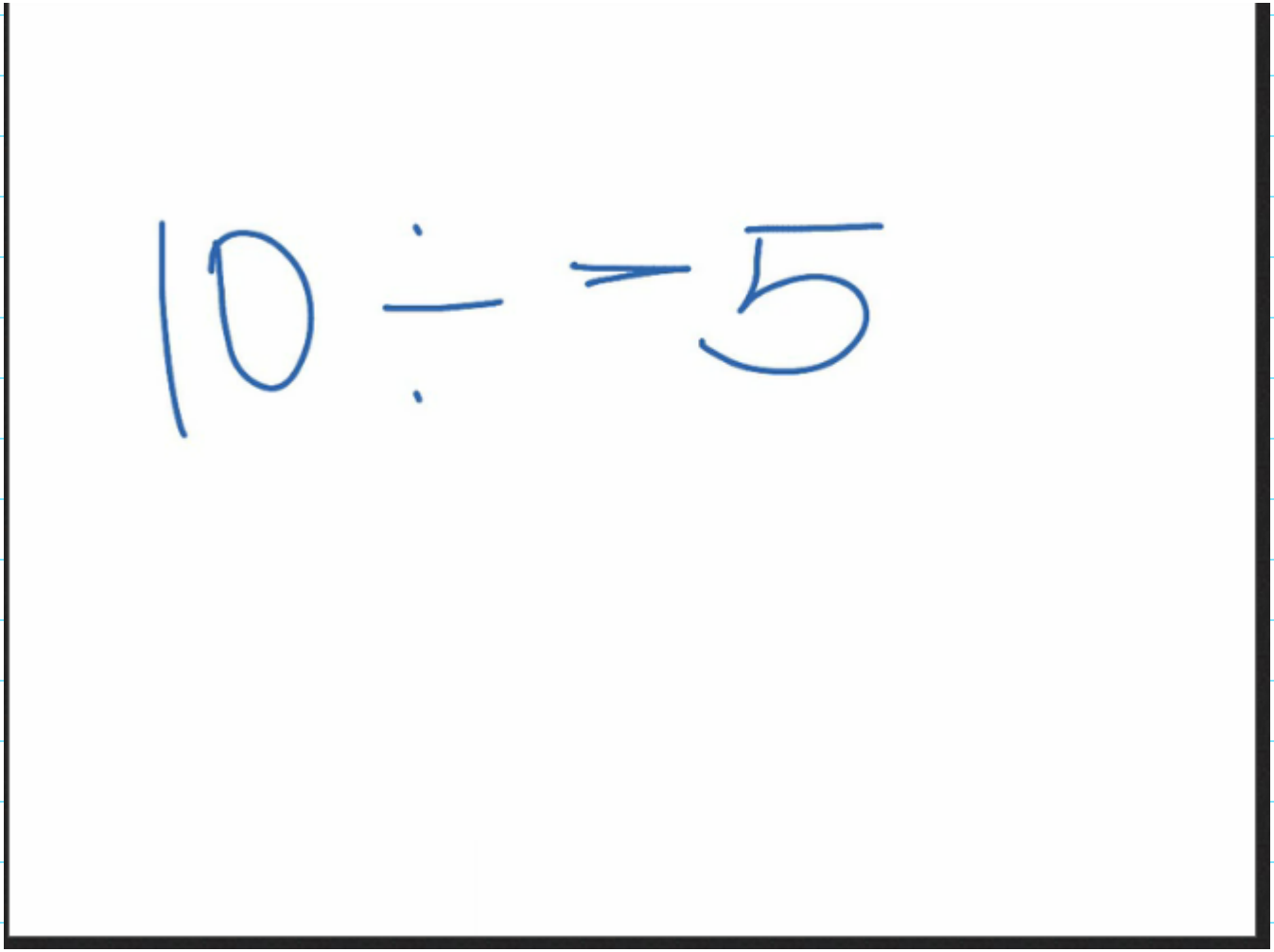
If the signs are the same...

- Divide and the quotient is positive
  $^{+}10 \div {}^{+}2 = {}^{+}5$ or $^{-}10 \div {}^{-}2 = {}^{+}5$

If the signs are different...

- Divide and the quotient is negative
  $^{+}10 \div {}^{-}2 = {}^{-}5$ or $^{-}10 \div {}^{+}2 = {}^{-}5$

That means the same rules apply for multiplying and dividing integers



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Lesson 2.3 Multiplying and Dividing Integers (Day 2)

A submarine descends 720 feet in 6 minutes. Find the submarine's change in elevation per minute.

A descent is in the negative direction. So, you translate the change in elevation as −720 feet.

Change in elevation per minute:

$$\frac{-720}{6} =$$

What do we need to remember when multiplying and dividing integers?

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A submarine descends 720 feet in 6 minutes. Find the submarine's change in elevation per minute.

A descent is in the negative direction. So, you translate the change in elevation as −720 feet.

Change in elevation per minute:

$$\frac{-720}{6} = -120 \text{ ft/min}$$

Lesson 2.3 Multiplying and Dividing Integers (Day 2)

Evaluate each quotient. a) $-25 \div (-5)$ b) $-81 \div 3$ c) $96 \div (-4)$	What do we need to remember when multiplying and dividing integers?

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6 $-36 \div (-4)$ 7 $-35 \div 5$ 8 $45 \div (-3)$	What do we need to remember when multiplying and dividing integers?

9 Find the change in elevation per minute of a hiker who descended 320 feet in 40 minutes.

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Guided Practice

Evaluate each quotient.

6. $-36 \div (-4)$ 9

7. $-35 \div 5$ -7

8. $45 \div (-3)$ -15

Solve.

9. Find the change in elevation per minute of a hiker who descended 320 feet in 40 minutes. -8 ft/min

Lesson 2.3 Dividing Integers

Independent Practice 2.3 # 22-24

****Challenge #35****

Name:_____

Practice 2.3

Evaluate each quotient.

22. $125 \div (-25)$
23. $300 \div (-15)$
24. $-100 \div 25$
25. $-32 \div 4$
26. $-480 \div (-12)$
27. $-144 \div (-24)$
28. $0 \div (-8)$
29. $0 \div (-111)$

30. While returning to the glider port, Laura descended at a rate of 380 feet per minute for 3 minutes. Calculate her change in altitude.
31. A scuba diver took 6 minutes to rise to the surface at a rate of 30 feet per minute. How far was he below sea level?
32. An elevator descends 1,500 feet in 60 seconds. Find the change in height per second.
33. A scientist measures the change in height per second of a diving osprey as −198 feet per second. Find the change in position of the osprey after 2 seconds.

34. *Math Journal* Margaret wrote $-25 \div (-100) = \frac{-25}{-100} = -\left(\frac{1}{4}\right)$ and $-2 \cdot (-2) = -4$. Discuss and correct her mistakes.

Challenge

35. *Math Journal* Umberto has trouble solving $-12 \div 3 \cdot 2 \div (-4)$. Write an explanation to help him.

Name: _____

Multiplying Integers Scavenger Hunt

Each group will start at a different card. Record the letter on the top of the card you start with in box 1 below, then solve the problem that is written on the card, using box 1 to show your work. Next, look for the answer to that problem on the bottom of another card. When you find it, go to that card next, record the letter on that card in box 2 and solve the problem. Repeat this until you get back to the card you started with.

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

Homework

Wednesday Homework #1-6 Course 2

Read each question carefully.

1) What is the difference?

(-89) - (-562)

A) -345
B) 176
C) 473
D) 651

2) What is the sum?

(-51) + 61

A) -112
B) -10
C) 10
D) 112

3) What is the difference?

(-63) - 65

A) -128
B) -2
C) 2
D) 128

Lesson Check *#22 and 26*

(can divide integers)

If time permits, work with partner on scavenger hunt