7th Grade Math
Unit 2
Integers and Rational Numbers

Name: _____ Period: _____

Common Core State Standards

CC.7.NS.1 - Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

CC.7.NS.2 - Apply and extend previous understandings of multiplication and division of fractions to multiply and divide rational numbers.

CC.7.NS.3 - Solve real-world and mathematical problems involving the four operations with rational numbers.

CC.7.EE.4 - Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

Scope and Sequence

Day 1	Lesson 2-1	Day 10	Lesson 2-5
Day 2	Lab	Day 11	Lesson 2-5
Day 3	Lesson 2-2	Day 12	Quiz
Day 4	Lesson 2-2	Day 13	Lesson 2-6
Day 5	Lab	Day 14	Lesson 2-6
Day 6	Lesson 2-3	Day 15	Lesson 2-7
Day 7	Lesson 2-3	Day 16	Lesson 2-7
Day 8	Lesson 2-4	Day 17	Review
Day 9	Lesson 2-4	Day 18	Test

IXL Modules

SMART Score of 80 is required
Due the day of the exam

Lesson 1	7.B.1	Understanding integers
	7.B.2	Integers on number lines
	7.B.3	Graph integers on number lines
	7.B.4	Absolute value and opposite integers
Lesson 2-3	7.C.1	Integer addition and subtraction rules
	7.C.2	Add and subtract integers using counters
	7.C.3	Add and subtract integers
	7.C.4	Complete addition and subtraction equations with integers
	7.C.5	Add and subtract integers: word problems
Lesson 4	7.C.6	Integer multiplication and division rules
	7.C.7	Multiply and divide integers
	7.C.8	Complete multiplication and division equations with integers
	7.C.9	Evaluate numerical expressions involving integers
Lesson 5	7.T.5	Solve one-step equations
Lesson 6	7.H.2	Convert between decimals and fractions or mixed numbers
Lesson 7	7.H.4	Compare rational numbers
	7.H.5	Put rational numbers in order

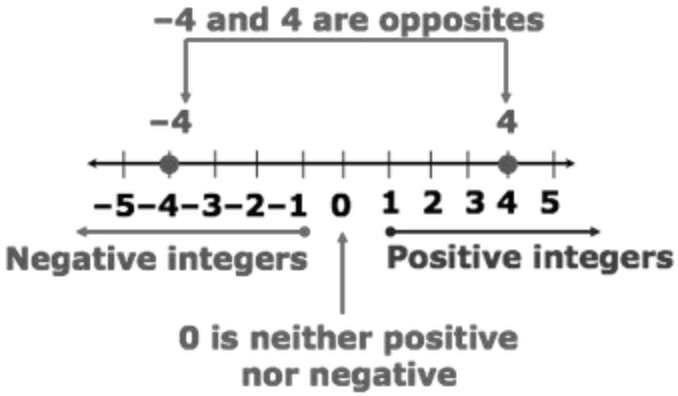
Lesson 2-1

Integers

Warm-Up

Vocabulary

The **opposite** of a number is the same _____ from 0 on a number line as the original number, but on the _____ _____ of 0. Zero is its own opposite.



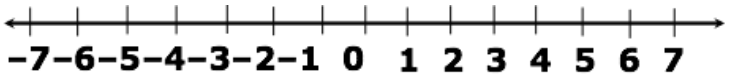
The **integers** are a set of _____ numbers and their _____. By using integers, you can express elevations above, below, and at sea level. Sea level has an elevation of _____ feet.

Remember!

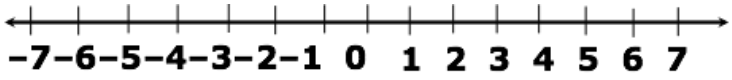
The whole numbers are the counting numbers and zero: 0, 1, 2, 3, ...

Examples: Graphing Integers and Their Opposites on a Number Line

Graph the integer -7 and its opposite on a number line.



Graph the integer -5 and its opposite on a number line.



You can compare and order integers by graphing them on a number line. Integers _____ in value as you move to the _____ along a number line. They _____ in value as you move to the _____.

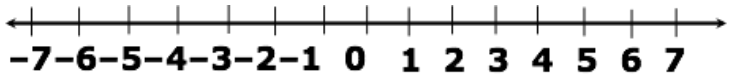
Remember!

The symbol < means "is less than," and the symbol > means "is greater than."

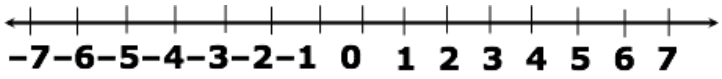
Examples: Graphing Integers and Their Opposites on a Number Line

Compare the integers. Use < or >.

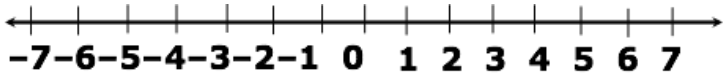
4 ☐ -4



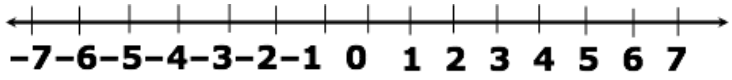
-15 ☐ -9



6 ☐ -6



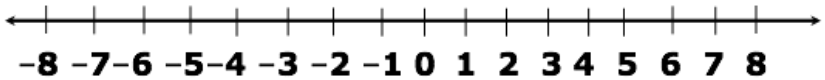
-4 ☐ -11



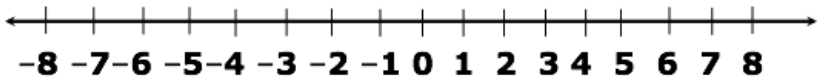
Examples: Ordering Integers Using a Number Line

Use a number line to order the integers from least to greatest.

-3, 6, -5, 2, 0, -8



-5, 4, -3, 2, -1, -2



A number's **absolute value** is its _____ _____ _____ on a number line. Since distance can _____ be negative, absolute values are never negative. They are _____ positive or zero.

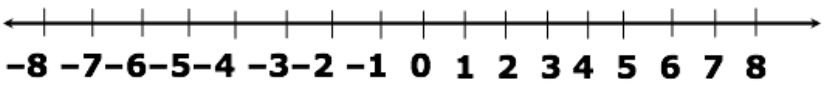
Reading Math

The symbol | |is read as "the absolute value of."
For example |-3| is the absolute value of -3.

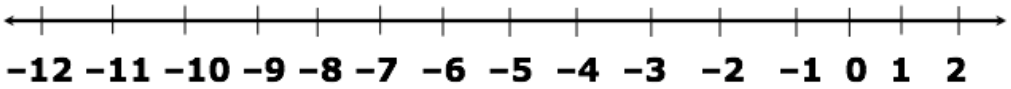
Examples: Finding Absolute Value

Use a number line to find each absolute value.

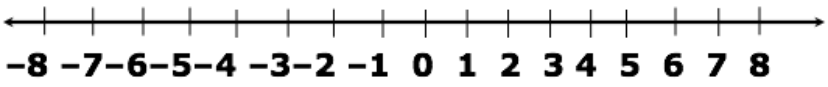
|8|



|–12|



|3|



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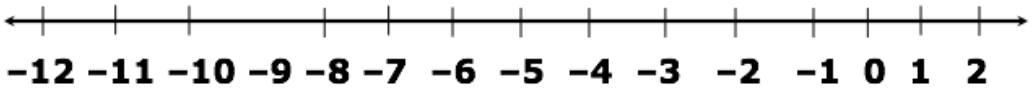


Lesson 2-2

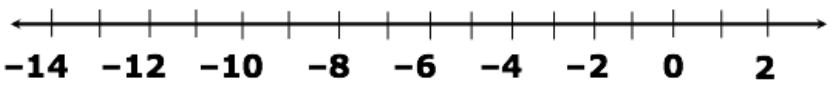
Adding Integers

Warm-Up

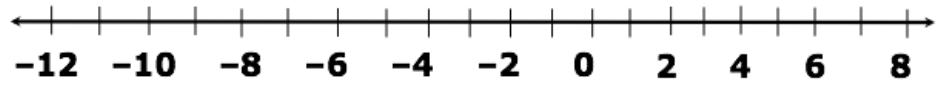
Examples: Modeling Integer Addition

Use a number line to find each sum

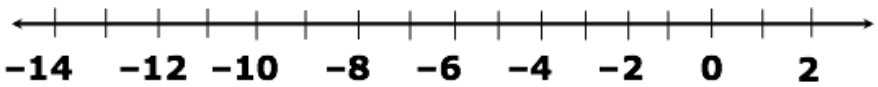
-7 + (-4)



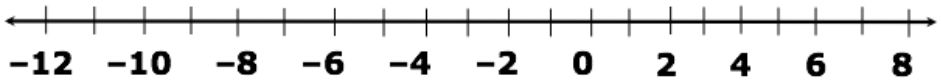
-12 + 19



-4 + (-5)



-7 + 12



Adding Integers

- **To add two integers with the same sign:**

  Find the _____ of their absolute values. Use the sign of the two integers.

- **To add two integers with different signs:**

  Find the _____ of their absolute values. Use the sign of the integer with the _____ absolute value.

Helpful Hint

When adding integers, think: if the signs are the *same*, find the *sum*. If the signs are *different*, find the *difference.*

Examples: Adding Integers Using Absolute Values

Find each sum.

-4 + 8
23 + (-35)
-5 + 3
-13 + (-24)

Examples: Evaluating Expressions with Integers

Evaluate $x + y$ for $x = -42$, $y = 71$

Evaluate $x + y$ for $x = -24$, $y = 17$

Examples: Application

The jazz band's income from a bake sale was $286. Expenses were $21. Use integer addition to find the band's total profit or loss.

The French Club was raising money for a trip to Washington D.C. Their car wash raised $730. They had expenses of $52. Use integer addition to find the club's total profit or loss.

Lesson 2-3

Subtracting Integers

Warm-Up

You can model the difference between two integers by using a number line. When you subtract a positive number, the difference is _____ than the original number, so you move to the _____. To subtract a negative number, move to the _____.

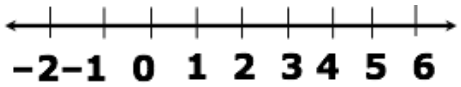
Helpful Hint

If the number being subtracted is less than the number it is being subtracted from, the answer will be positive. If the number being subtracted is greater, the answer will be negative.

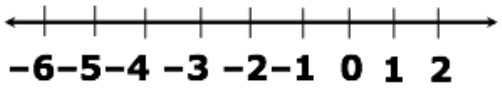
Examples: Modeling Integer Subtraction

Use a number line to find each difference.

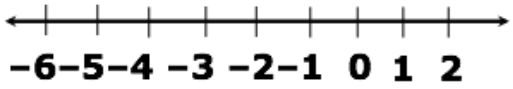
4 - 1



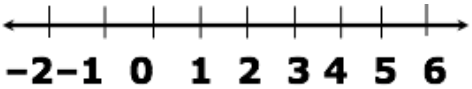
-3 - 1



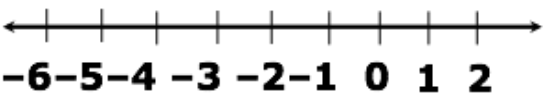
-2 - (-4)



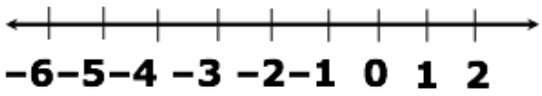
3 - 2



-2 - 4



-4 - (-2)



Addition and subtraction are _____ operations...they "undo" each other. Instead of subtracting a number you can **add its opposite**.

Examples: Subtracting Integers by Adding the Opposite

Find each difference.

5 - (-2)
-3 - 7
-1 - (-8)
4 - 2
-2 - (-6)

-1 - 4

Examples: Evaluating Expressions with Integers

Evaluate x - y for each set of values.

x = -3 and y = 2
x = 4 and y = -6
x = -4 and y = -3
x = -4 and y = 5

Examples: Temperature Application

Find the difference between 32°F and -10°F

Find the difference between 8℉ and -5℉

Lesson 2-4

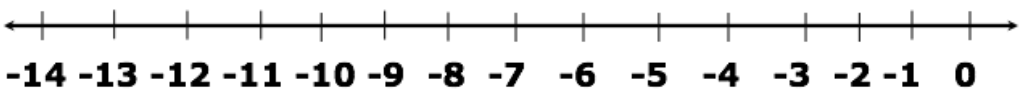
Multiplying and Dividing Integers

Warm-Up

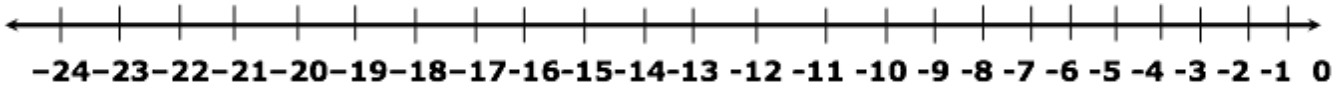
Examples: Multiplying Integers Using Repeated Addition

Use a number line to find each product.

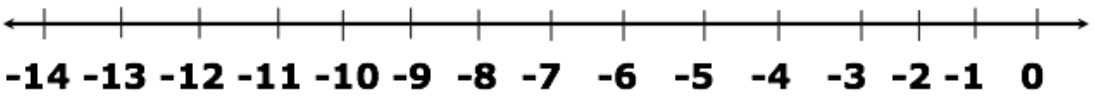
-7 · 2



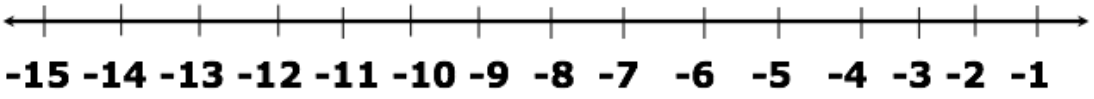
-8 · 3



-3 · 2



-5 · 3



Multiplying and Dividing Two Integers

If the signs are the _____ your answer will be _____.

If the signs are _____ your answer will be _____.

Examples: Multiplying Integers

Find each product.

-6 · (-5)	-2 · (-8)
-4 · 7	-3 · 5

Examples: Dividing Integers

Find each quotient.

35 □ (-5)	-12 □ 3
-32 □ (-8)	45 □ (-9)

-48 □ 6	-25 □ (-5)

Examples: Averaging Integers

Mrs. Johnson kept track of a stock she was considering buying. She recorded the price change each day. What was the average change per day?

Day	Mon	Tue	Wed	Thu	Fri
Price Change ($)	–$1	$3	$2	–$5	$6

Mr. Reid kept track of his blood sugar daily. He recorded the change each day. What was the average change per day?

Day	Mon	Tue	Wed	Thu	Fri
Unit Change	–8	2	4	–9	6

Lesson 2-5

Solving Equations Containing Integers

Warm-Up

Vocabulary

Inverse Property of Addition - The sum of a number and its opposite, or additive inverse is 0.

Examples: Solving Addition and Subtraction Equations

Solve each equation. **Check each answer!**

-6 + x = -7	Check:

$p + 5 = -3$	Check:
$y - 9 = -40$	Check:
$-3 + x = -9$	Check:
$q + 2 = -6$	Check:
$y - 7 = -34$	Check:

Examples: Solving Multiplication and Division Equations

Solve each equation. **Check each answer!**

$\frac{b}{-5} = 6$	Check:
$-400 = 8y$	Check:
$\frac{c}{4} = -24$	Check:
$-200 = 4x$	Check:

Examples: Business Application

In 2003, a manufacturer made a profit of $300 million. This amount was $100 million more than the profit in 2002. What was the profit in 2002?

This year the class bake sale made a profit of $243. This was an increase of $125 over last year. How much did they make last year?

Lesson 2-6

Equivalent Fractions and Decimals

Warm-Up

To convert a fraction to a decimal, divide the _____ by the _____.

Examples: Writing Fractions and Decimals

Write each fraction as a decimal. Round to the nearest hundredth, if necessary.

$\frac{1}{4}$	$\frac{9}{5}$

$\frac{5}{3}$	$\frac{3}{4}$
$\frac{6}{5}$	$\frac{7}{3}$

Decimals that come to an end are called _____ decimals.

Decimals that have a pattern that repeats forever are called _____ decimals.

Examples: Using Mental Math to Write Fractions as Decimals

Write each fraction as a decimal.

$\frac{4}{5}$	$\frac{37}{50}$
$\frac{3}{5}$	$\frac{18}{25}$

Examples: Writing Decimals as Fractions

Write each decimal as a fraction in simplest form.

0.018	1.55

0.015	1.30

Examples: Sports Application

A football player completed 1,546 of the 3,875 passes he attempted. Find his completion rate. Write your answer as a decimal rounded to the nearest thousandth. (You may use a calculator)
Johnny Unitas, a former professional quarterback, completed 2,830 of the 5,186 passes he attempted. Find his completion rate. Write your answer as a decimal rounded to the nearest thousandth. (You may use a calculator)

Lesson 2-7

Comparing and Ordering Rational Numbers

Warm-Up

When to fractions have the _____ denominator, just compare the numerators.

Examples: Comparing Fractions

Compare the fractions. Write < or >.

$\frac{7}{9} \square \frac{5}{8}$	$-\frac{2}{5} \square -\frac{3}{7}$

$\frac{5}{6} \square \frac{7}{8}$	$-\frac{6}{8} \square -\frac{5}{7}$

To compare decimals, line up the decimal points and compare digits from left to right until you find the place where the digits are _____.

Examples: Comparing Decimals

Compare the decimals. Write < or >.

.0427 ☐ 0.425	$.7\overline{3}$ ☐ 0.734
.0535 ☐ 0.538	$.\overline{3}$ ☐ 0.334

A **rational number** is a number than can be written as a fraction with _____ for its numerator and denominator. When rational numbers are written in a variety of forms, you can compare the number by writing them all in the _____ form.

Examples: Ordering Fractions and Decimals

Order $\frac{4}{5}$, 0.93, and 0.9 from least to greatest.
Order $\frac{3}{5}$, 0.84, and 0.7 from least to greatest.