Name: _____ Date: _____ Block: _____

STEM - Math 8

Unit 1 – Integers

Lesson 1 - Integers and the Number Line

Goals:
- Order and compare integers on the number line
- Label an integer's opposite

Warm – up: *What is an integer? You may use an example.*

Natural numbers: are counting numbers

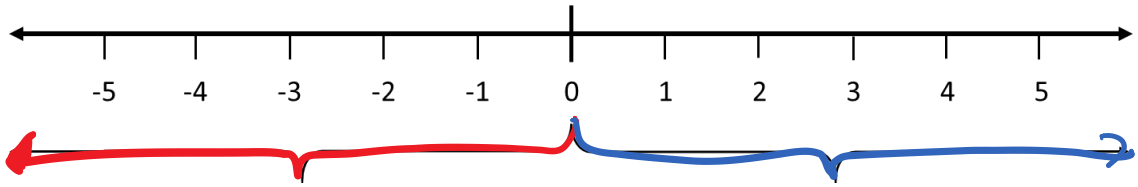
Ex: 1, 2, 3, 4, 5…

Whole numbers: natural numbers AND zero

Ex: 0, 1,2,3

The ' …' means that that number pattern goes on forever (to infinity) …

Integers: positive and negative whole numbers (what you see on a number line).
- Are negative and positive whole numbers (they don't have decimals and are not fractions)
- Zero is also considered an integer



Negative Numbers
- Are to the left of zero
- Always are written with a negative sign '-' before them

Positive Numbers
- Are to the right of zero
- Can be written with or without a positive sign (+)

Integers are used to represent situations in real life:

Ex: twelve degrees Celsius below freezing: -12°C

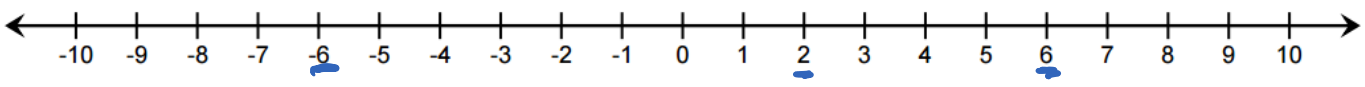
Comparing Integers
- If you have two or more integers, the number to the farthest right on a number line is the greatest integer.

We use the following symbols to indicate the relationship between two integers or two variables and integers:

Operator	Meaning
<	Less than
≤	Less than **or** equal to
=	Equal to
>	Greater than
≥	Greater than **or** equal to

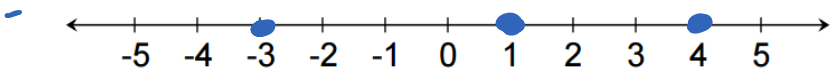
Ex: Compare the following pairs of integers, you may use the number line below to help:

a. 6 > 2 **b.** 6 > -6 **c.** -11 < 8

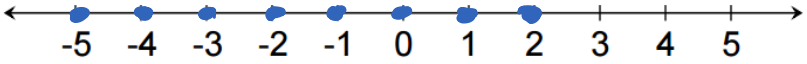


Ex: Plot the following on the number lines below:

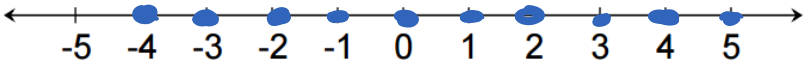
a) Integers -3, 1 and 4



b) Integers x< 3

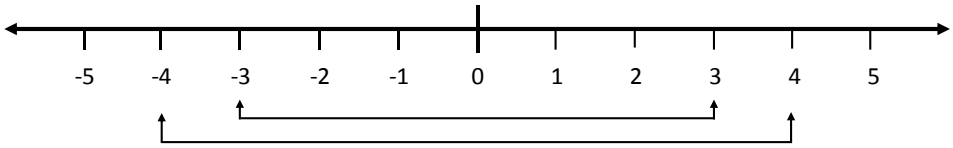


c) Integers c ≥ -4



An **opposite of an integer** has the same numerical value but opposite signs.

- They are the Same distance from zero but in the opposite direction
- You can find the opposite of any integer by putting a minus sign in front of the original number



Number	Reason	Opposite
3	Both values are 3 units from zero on the number line	-3
-3	The opposite of -3 is 3. Therefore – (-3) must equal +3	- (-3) = +3
+3	The values of 3 and + 3 are the Same number, therefore –(+3) must be -3.	-(+3) = -3

ASSIGNMENT 1: (HIGHLIGHT WHAT IS INCORRECT AND GO BACK AND CHANGE)

Level 1:

1. Write as an integer:

a) 5 floors above ground: +5

b) Three floors below ground: -3

c) 18°C above zero: 18°C

d) 6°C below zero: -6°C

e) You owe $250 dollars: -250

f) You have $15 in your wallet: +15

g) Death valley is 86 m below sea level: -86m

h) Grouse Mtn. has an elevation of 1,231 m: +1231m

2. Use the number line below to help you fill in the blank space with <, or > to make a true statement:

a) 3 > -2

b) -4 < 4

c) 5 > -6

d) -8 < 1

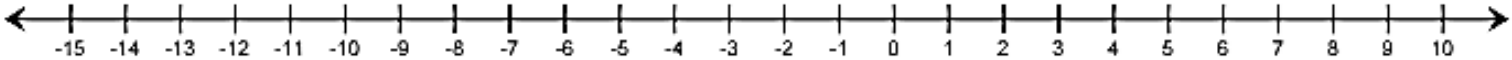
e) -7 < -3

f) -4 > -8

g) -11 > -15

h) 8 > -15

i) -1 > -15



Level 2:

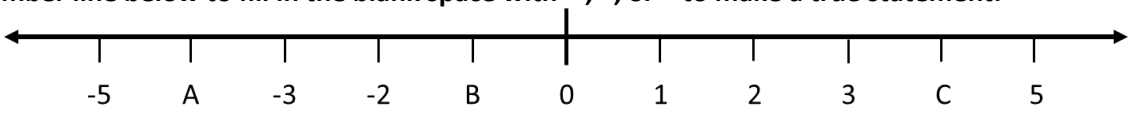
3. List in order from least to greatest:

a) -3, -5, 7: 5, -3, 7

b) 1, -3, 5, -7: -7, -3, 1, 5

c) – 2, 5, -22, 11: -22, -2, 5, 11

4. Use the number line below to fill in the blank space with < , >, or = to make a true statement:



a) C > 3

b) B < 0

c) – 1 = B

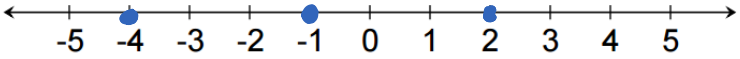
d) B > -3

e) A < B

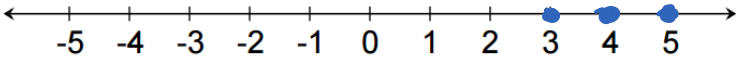
f) A < -1

5. Plot the following on the number lines:

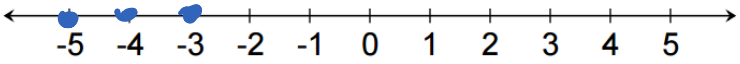
a) Integers -1, 2 and -4



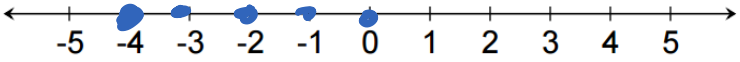
b) Integers greater than or equal to 3



c) Integer less than -2

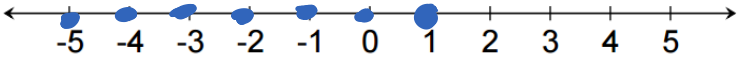


d) Integers greater than or equal to -4 and less than 1

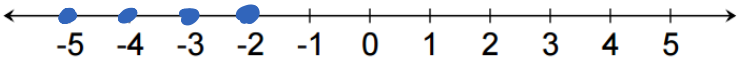


6. Plot the following on the number lines:

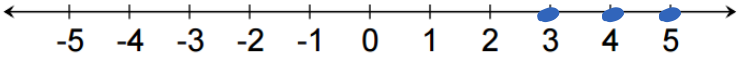
a) $X < 2$



b) $X \leq -2$



c) $-2 < X \geq 3$



Level 3:

7. Express as an integer pattern using X and ≥ or ≤.

a) 2, 3, 4,… $X \geq 2$

b) -5, -6, -7, …. $X \leq -5$

8. Find the opposite of each number:

a) -3 : 3

b) +2: -2

c) –(+2) : 2

d) – (–3): -3

9. Solve:

a) What integer is half the size of 4? 2	b) What is the smallest positive integer? 1
c) What integer is twice as large as 4? 8	d) What is the greatest negative integer? $-\infty$
e) What integer is half the size of -2? -1	f) For what numbers x is –x negative? when x is (+)ve
g) What integer is triple the size of -3? -9	h) For what numbers x is –x positive? when x is (-)ve

ANSWERS: