

**Unit 2:**  
**Multiplication & Division of Integers**



**Multiplying Integers with Two Color Counters**

$4 \times 2 =$   
*"Add 4 copies of 2."*

Four vertical rectangular boxes are shown, each containing two yellow circles with a plus sign inside, representing 4 copies of 2.

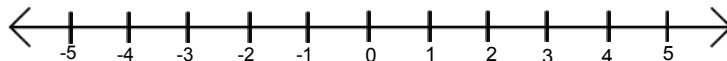
Integers

**Integers** are positive and negative whole numbers.ex. -4, +8, -25

**Rational numbers** are almost all negative and positive numbers, including decimals and fractions.

**Opposite integers** are the same number but have different signs. Ex. -9,+9 ; -16,+16; +24,-24; +7,-7

Integers can be displayed on a vertical or horizontal number line.  
Horizontal Number line

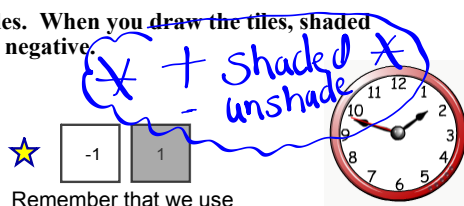
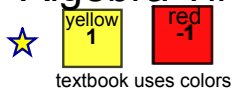


When comparing integers on a number line **numbers to the left are negative** and **numbers to the right of zero are positive**. The number to the right is always greater. Positive integers are always greater than negative integers

The zero principle states that a positive and a negative together will always give you zero.

You can represent integers using algebra tiles. When you draw the tiles, shaded represent positive and unshaded represents negative.

**Algebra Tiles**



Remember that we use shaded for + and unshaded for -  
+ is yellow in the textbook  
- is red in the textbook

Remember from last year Adding or Subtracting Integers

Adding (Draw in different levels both integers)

1) top Bottom  
 $(-9) + (+9) = 0$

Subtracting (remove but may need to make zero pairs)

2)  $(-2) - (+3) = -5$

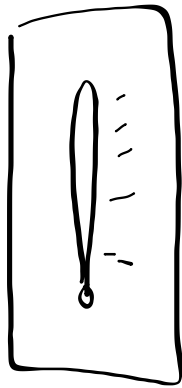
Step 1: Draw first integer

Step 2: Then subtract means to REMOVE the second integer

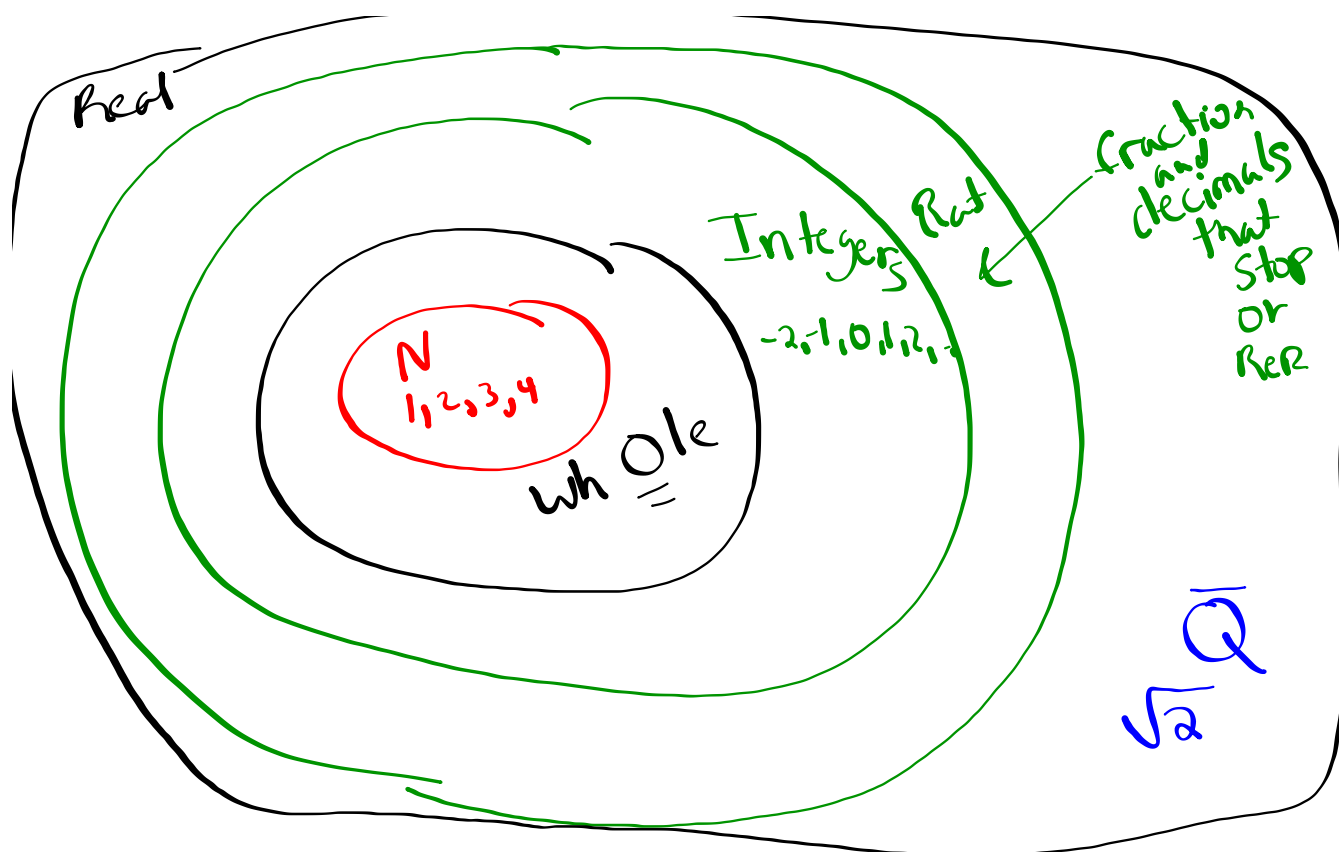
HINT: May need to use zero pairs

= 00 00 0

$$\begin{matrix} (-2) & - & (+3) \\ & \downarrow & \text{add off} \\ (-2) & + & (-3) \end{matrix}$$



→ walk



$$2 \times 3$$

2 groups of 3

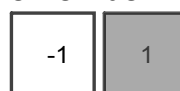
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$$2 \times 3 = 6$$
$$3 \times 2 \nearrow$$

Multiplying Integers by Modeling IILES

remember



or



Ex1) **put down**

★ What does  $(+2) \times (+3)$  mean?  
2 groups of +3



$(+2) \times (+3) = + 6$

Ex2)

★ What does  $(+4) \times (+2)$  mean?  
4 groups of +2



$(+4) \times (+2) = + 8$

Ex3) What does  $(+3) \times (-3)$  mean?

★ 3 groups of -3



$(+3) \times (-3) = - 9$

Ex4) What about  $(+6) \times (-1)$ ?

★ 6 groups of -1



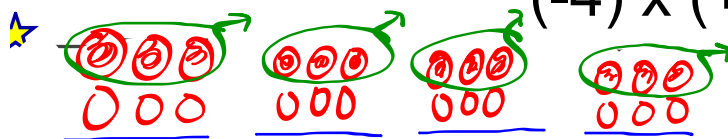
$(+6) \times (-1) = - 6$

Ex5) What about  $(-4) \times (+3)$ ?

★ 3 groups of -4

You can use the **Commutative rule** when multiplying order **does not matter**

$(-4) \times (+3) = (+3) \times (-4)$



$(-4) \times (+3) = -$

$= 000 \quad 000 \quad 000 \quad 000$  OR

$= - 12$

$(+3) \times (-4)$

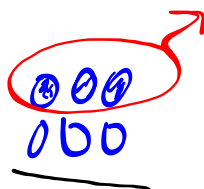
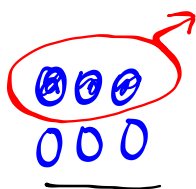
If the first integer is positive it means lay down.....  
~~X~~ But **Study on test and Quiz**

If the first integer is **NEGATIVE** then it means take away groups (Since starting with negative you need zero pairs)

can also model  $(-4) \times (+3)$  as follows (Always start with zero)

$$(-2) \times (+3) = -6$$

Remove 2 groups of +3



$$= 000 \quad 000$$



What is the rule for multiplying a positive integer by a positive integer?

★ When you multiply two positive integers, you simply multiply the numbers and your answer will always be positive.

$$(+7) \times (+5) = +35$$

$$(+12) \times (+10) = +120$$

Remember  $(+) \times (+) = (+)$  \*

What is the rule for multiplying a positive integer by a negative integer?  
Does the order matter?

★ When you multiply a positive integer and a negative integer, you multiply the numbers, and your answer will always be negative.

$$(+6) \times (-3) = -18$$

$$(+9) \times (-4) = -36$$

$$(-8) \times (+6) = -48$$

$$(-4) \times (+7) = -28$$

$$* (+) \times (-) = (-)$$

$$(-) \times (+) = (-)$$

Memorize