





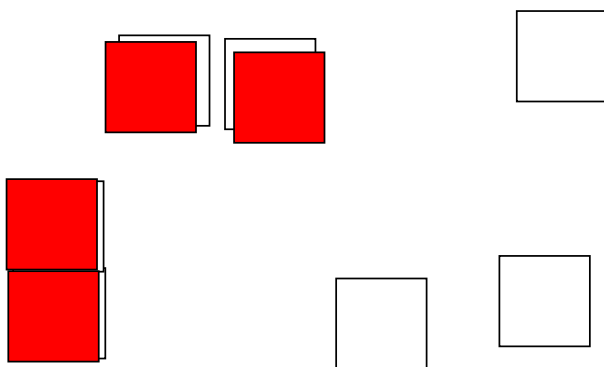
## 2.2-2.3 Adding and Subtracting Real Numbers

 = +1

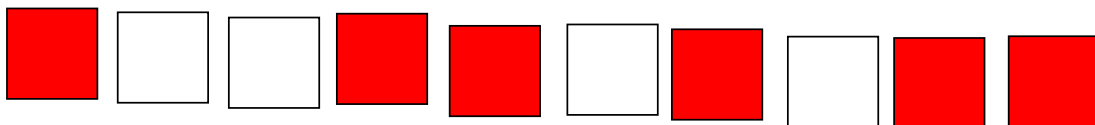
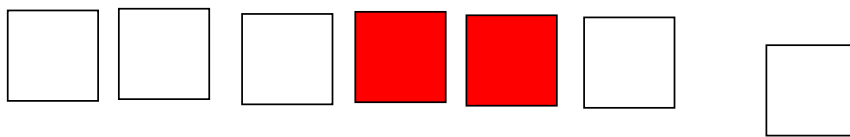
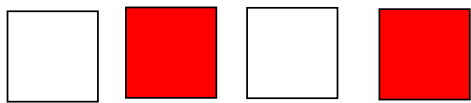
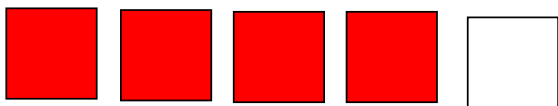
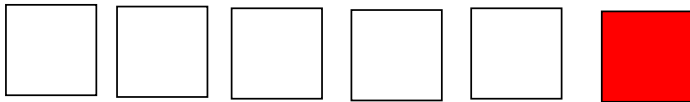
 = -1

ex. 1

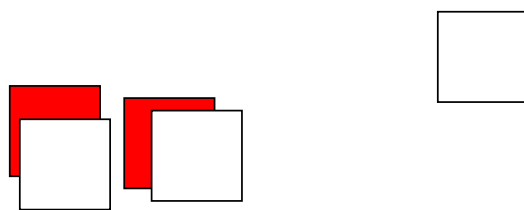
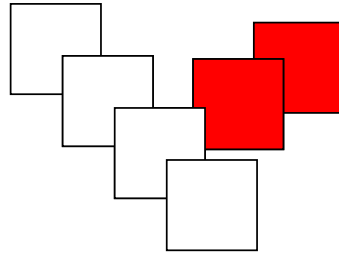


# Examples

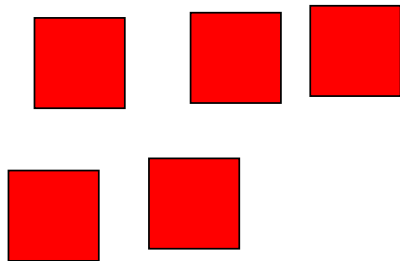


# Adding Integers

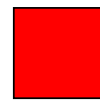
$-2 + 3$



$-2 + -3$

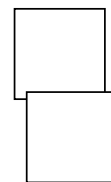


$3 + -3$

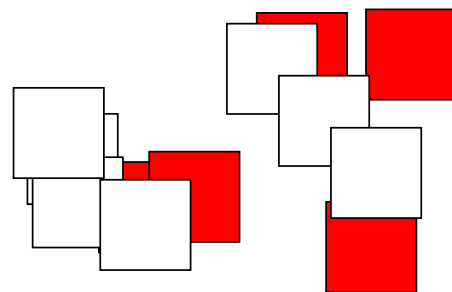


Other Examples:

$-5 + 2$



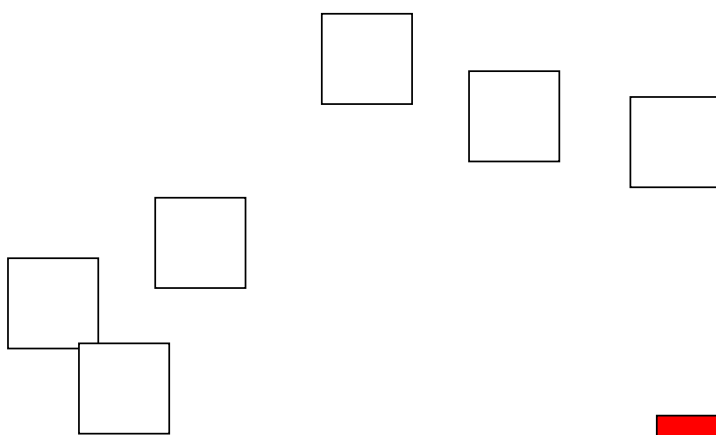
$-1 + 4$   
 $5 + -6$



# Subtracting Real Numbers

$$-2 - 3$$

$$4 - -2$$



## Other Examples

$$-3 - -2$$

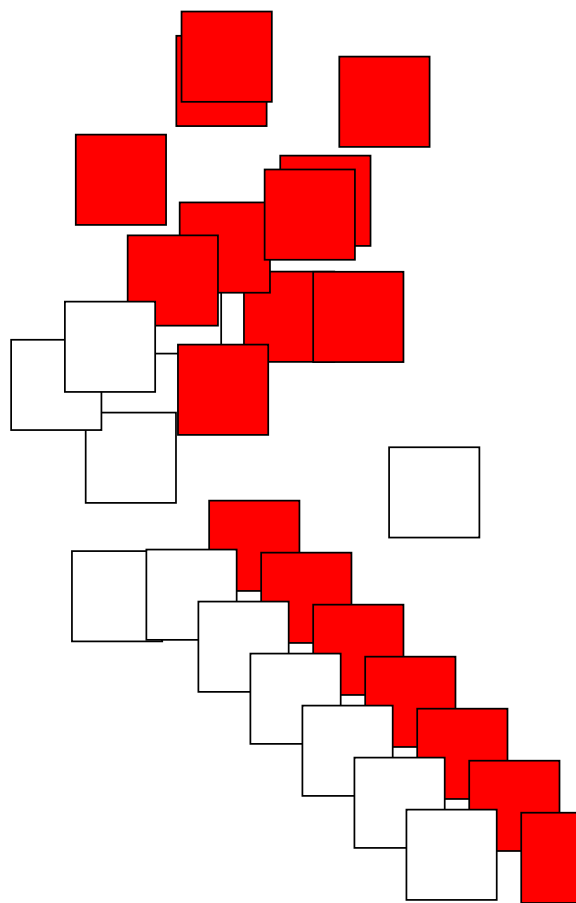
$$-6 - 1$$

$$5 - 8$$

$$6 - 3$$

$$-2 - -5$$

$$0 - 4$$



Adding = Moving to the Right

Subtraction = Moving to the Left

$$-2 + 3$$

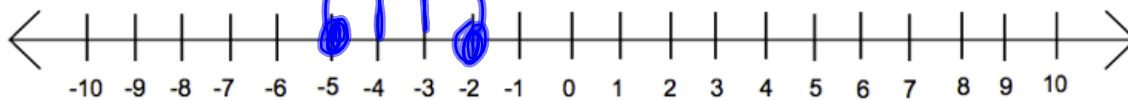
START END

$$-2 + 3 = 1$$



$$-2 - 3 = -5$$

End start



# Patterns of Adding and Subtracting Real Numbers

# Notecard- Adding and Subtracting Real Numbers

## Addition

Commutative Property:

$$a + b = b + a \quad 1 + 3 = 3 + 1$$

Associative Property:

$$(a + b) + c = a + (b + c)$$

$$(1 + 5) + 3 = 1 + (5 + 3)$$

Identity Property:

$$a + 0 = a$$

Property of Zero (zero Pair)

$$a + (-a) = 0$$

## Subtraction

To subtract  $b$  from  $a$ , add the opposite of  $b$  to  $a$

$$a - b = a + (-b)$$

$$3 - 4 = 3 + (-4) = -1$$

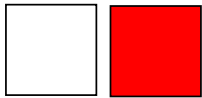
$$-3 - 2 = -3 + (-2) = -5$$

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

# Multiplying

= +1

= -1



*+ Same*  
*- opposite*

$\pm \# \cdot \pm \# =$  How many total

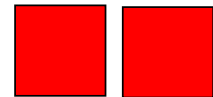
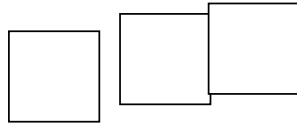
*how many are in each group*

*how many groups*

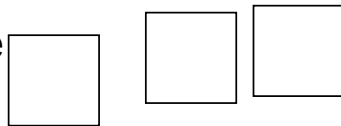
*sign of what's in the group*

## Positive times Positive

$2 \cdot 3$



Two groups of three

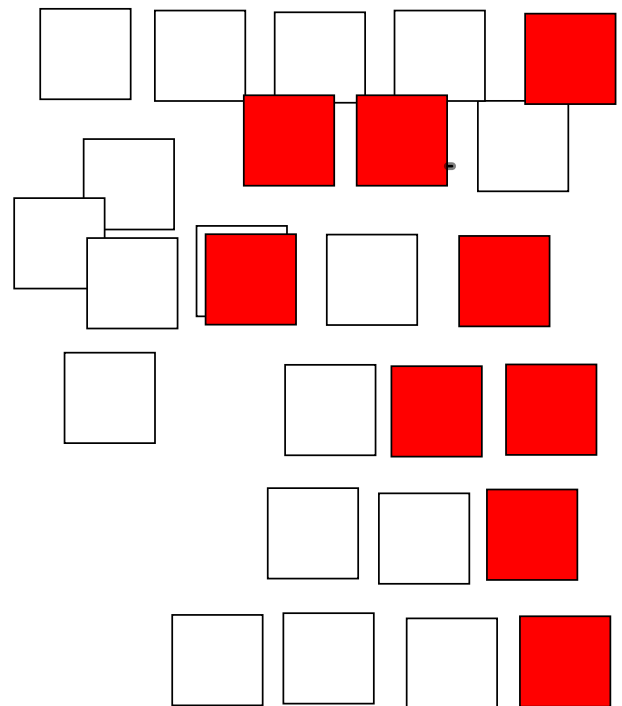
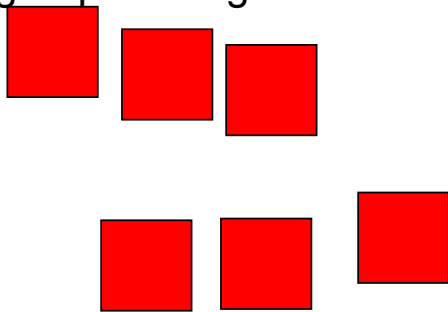




## Positive times negative

$$2 \cdot -3$$

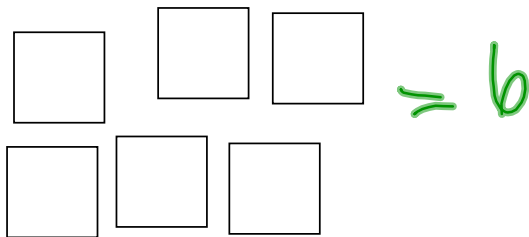
Two groups of negative three



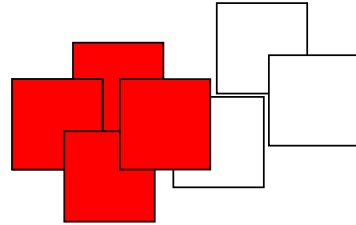
## Negative times Positive

$$-2 \cdot 3$$

The Opposite of two groups of three



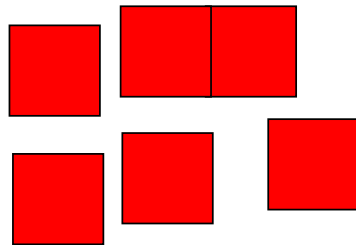
opposite = -6



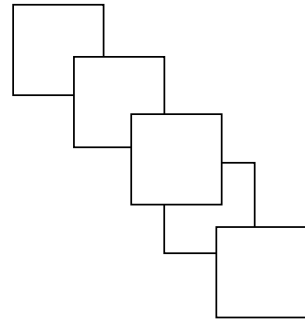
## Negative time Negative

$$-2 \cdot -3$$

The opposite of two groups  
of negative three



$$= -6 \text{ opposite} = 6$$



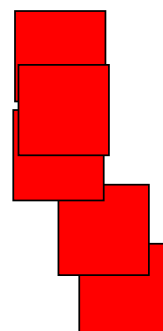
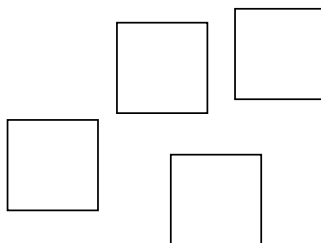
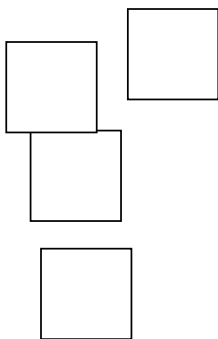
# Dividing Integers

$\pm \# \cdot \pm \# = \#$  in each group  
*sign of tiles* (pointing to  $\pm$ )  
*total # tiles* (pointing to  $\#$ )  
*# of groups* (pointing to  $\pm$ )  
*opposite/same* (pointing to  $\cdot$ )

Positive divided by a positive

$$8 \div 2 = 4$$

Take eight tiles and divide them into two groups

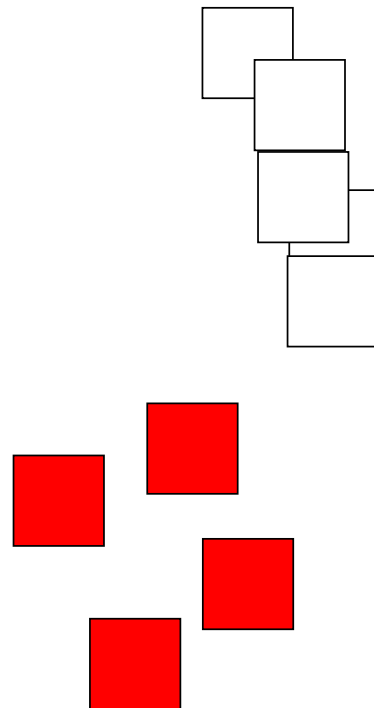
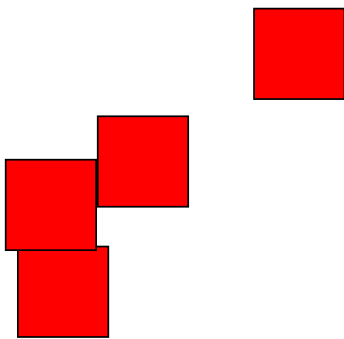


## Dividing Integers

Negative divided by a positive

$$-8 \div 2 = -4$$

Take eight negative tiles and divide them into two groups

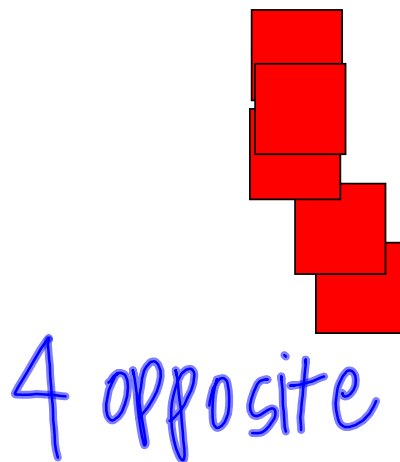
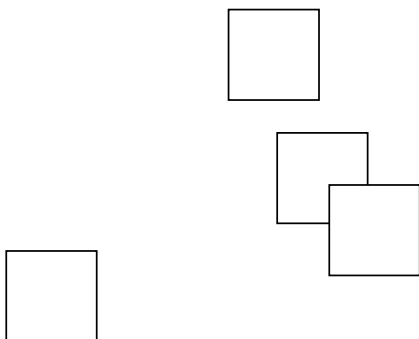


## Dividing Integers

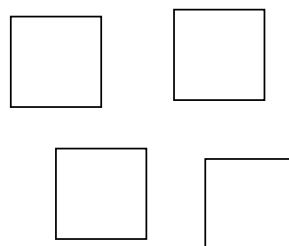
Positive divided by a negative

$$8 \div -2 = -4$$

Take eight tiles and divide them into two groups, then take the opposite of what is in each group



4 opposite

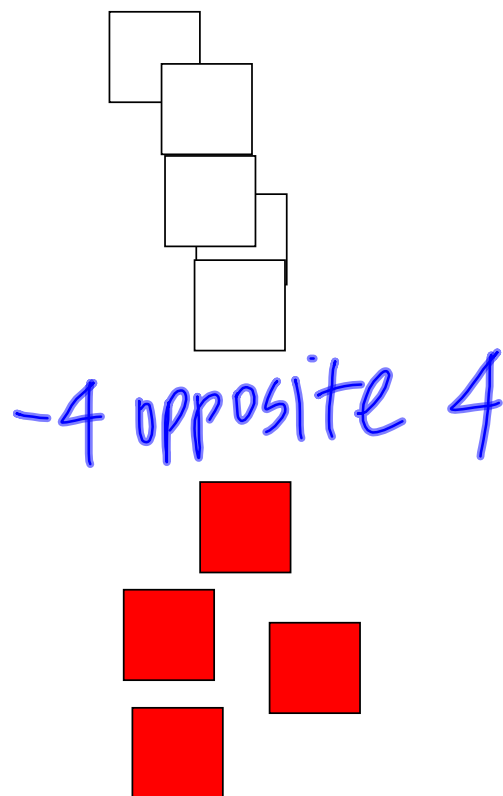
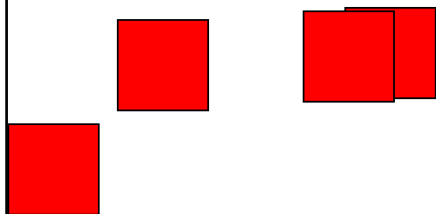


## Dividing Integers

Negative divided by a Negative

$$-8 \div -2 = 4$$

Take eight negative tiles and divide them into two groups, then take the opposite of what is inside each group.



## Patterns of multiplication and division

Positive times positive = $+$	Positive divided by positive = $+$
Positive times negative = $-$	Positive divided by negative = $-$
Negative times positive = $-$	Negative divided by positive = $-$
Negative times negative = $+$	Negative divided by negative = $+$



