Good Morning!

Today you will need:

- 2.1 labsheet (I will pass out)
- graph spiral
  Vocab sheet
- pencil

Head your graph spiral for <u>Problem 2.1</u>

Investigation 2

Adding and Subtracting Rational Numbers

In Investigation 1 you used number lines and chip boards to model rational numbers. Now, you will develop algorithms for adding and subtracting rational numbers.

An **algorithm** is a plan, or a series of steps, for doing a computation. In an effective algorithm, the steps lead to a correct answer, no matter what numbers you use. Your class may develop more than one algorithm for each operation. Set a goal to understand and skillfully use at least one algorithm for adding rational numbers and one algorithm for subtracting rational numbers.

algorithm

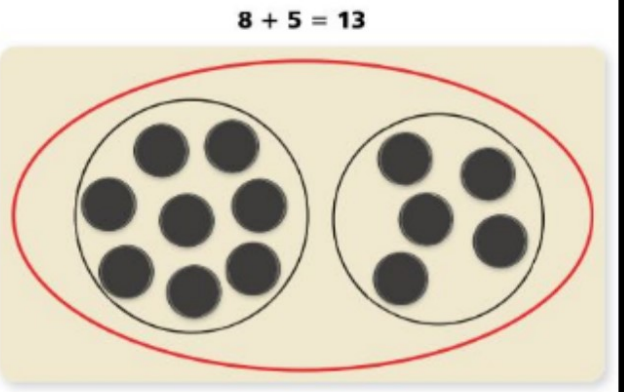
A set of rules for performing a procedure.	**ex:** **algorithm for multiplying fractions** 1. Multiply the numerators 2. Multiply the denominators 3. Simplify

2.1 Extending Addition to Rational Numbers

There are two common ways that number problems lead to addition calculations like $8 + 5$. The first involves combining two similar sets of objects, as in this example:

> Linda has 8 video games, and her friend has 5.
> Together they have $8 + 5 = 13$ games.

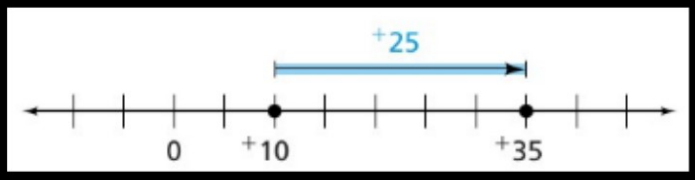
You can represent this situation on a chip board.



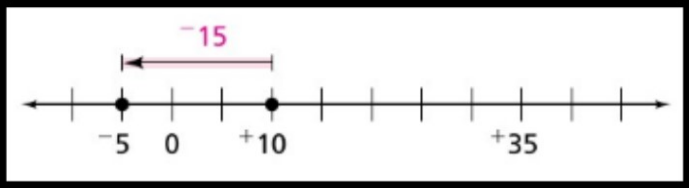
Number problems also lead to addition calculations when you add to a starting number. Here is an example:

> At a desert weather station, the temperature at sunrise was 10°C. It rose 25°C by mid-day. The temperature at noon was $10°C + 25°C = 35°C$.

You can represent this situation on a number line. The starting point is $^{+}10$. The change in distance and direction is $^{+}25$. The sum ($^{+}35$) is the result of moving a distance of 25 to the right.



Suppose, instead of rising 25°C, the temperature fell 15°C. The next number line shows that $^{+}10°C + {}^{-}15°C = {}^{-}5°C$.



Suppose that the temperature change one day is $^{-}25°C$. What could the original temperature and the final temperature be for that day?

As a team, answer the questions on page 32.
Record the answers in your graph paper.

A **1.** Find the sums in each group.

Use number line models or chip models to solve these problems.

Group 1	Group 2
$^{+}3 + {}^{+}7 =$	$^{+}6 + -3 =$
$^{+}6 + {}^{+}2 =$	$^{+}2 + -4 =$
$-4 + -3 =$	$-5 + {}^{+}1 =$
$-5 + -9 =$	$-3 + {}^{+}8 =$

2. What do the examples in each group have in common?

Class Work Answers:

	Group 1	Group 2
	$^{+}3 + {}^{+}7 = 10$ $^{+}6 + {}^{+}2 = 8$ $-4 + -3 = -7$ $-5 + -9 = -14$	$^{+}6 + -3 = 3$ $^{+}2 + -4 = -2$ $-5 + {}^{+}1 = -4$ $-3 + {}^{+}8 = 5$
2. What do the examples in each group have in common?	• all the problems are addition • the sign is the same for both numbers being added • the answer is the <u>sum</u> of the two numbers	• all the problems are addition • the signs are different for the numbers being added • the answer is the <u>difference</u> of the two numbers

add **POSITIVE** numbers

1. ADD the numbers

2. Will add more positives to make a bigger positive number

*examples:

$^{+}2 + {}^{+}7 =$ $^{+}6 + {}^{+}5 =$

add **NEGATIVE** numbers

1. ADD the numbers

2. Will add more negatives to make a "bigger" negative number

*examples:

$^{-}2 + {}^{-}7 =$ $^{-}6 + {}^{-}5 =$

add POSITIVE and NEGATIVE number

1. SUBTRACT the numbers

2. Will make less of the positive number, going down toward zero

*examples:

$^{+}2 + {}^{-}7 =$ $^{+}6 + {}^{-}5 =$

add NEGATIVE and POSITIVE number

1. SUBTRACT the numbers

2. Will make less of the negative number, going up toward zero

*examples:

$^{-}2 + {}^{+}7 =$ $^{-}6 + {}^{+}5 =$

Homework:

Paint the Sun and Wind worksheet

(no online answer key)