

Welcome to Exploring Integers!

Day 1

Bellringer:

List 3 things we model using whole numbers.

List 3 things we model using fractions.

Problem 1.

You enter on the ground level of a building, go up 10 floors, down 5 floors, then up 5 floors. What floor are you on?

As a group, illustrate this situation on your white board then write a math problem to represent your picture.

Be ready to explain your thinking.

As you look at each other's boards, what is the same? What is different? Explain how your group arrived at an answer.

How can we explain what happened without using "up" or "down"? Where is zero? Why is it there?

When we were on Floor 10, we went down 5 floors then up 5 floors.

Why did we end up back on Floor 10?

What kind of change did this represent?

Are there other pairs of integers that give zero change?

Why do these pairs give us no change?

What would happen if we started on Floor 10, went down 5 then down 7 more floors?

How does your picture change?

What is zero? What role does zero play now?

Copy what is on your board into your notebook.

Let's SUM UP what we know about integers so far in a concept map. [Do concept map in notebook.]

Have students do Exit Ticket, then Challenge Problems if there is time.

Write 3 things you learned about integers from this activity.

Write 2 things you observed about zero. Write 1 question you have about integers
OR

1 question you would like to pose to the class.

Challenge Problems:

- 1) You are on Floor 2. What “moves” would you make to move 4 floors up but end up on Floor 1? Illustrate with a picture and a math problem.
- 2) You are on Floor 3. What “moves” would you make to move 3 floors down but end up on Floor 6?
- 3) You are on Floor -1. What “moves” would you make to move 11 floors up but end up on Floor -2?

**Exploring Integers!
Day 2**

Bellringer:

The temperature on a thermometer read 4°F at dinner time, dropped 6° overnight, then went up 2° by 8 a.m. What is the temperature at 8 a.m.?

As a group, illustrate this situation on your white board then write a math problem to represent your picture.

Be ready to explain your thinking.

Board Meeting Questions:

Looking at each other’s boards, what is the same? different?

How does your picture of a thermometer compare to your picture of an building elevator yesterday?

What can we add to our description of positive and negative?

Put what is on your board into your notebook.

Exit Ticket:

Yellow = Positive

Red = Negative

Draw three columns on your board.

At the top of the first column write 0.

At the top of the second column write 2.

At the top of the third column write 5.

Using chips,

Illustrate each of the integers in 3 different ways each.

[Do Gallery Walk to see work of other groups.]

What is the same? What is different?

Do you want to make any changes to your board?

[Discuss various representations of 2.] Why is this a picture of 2?

How is your picture related to the elevator from yesterday? Are there any changes you want to make to your pictures of 5?

[Choose a representation of 2. I chose Y Y Y R.] Write an addition problem for Y Y Y R.

Are there other addition problems we can write?

Write at least 2 addition problems for each of the representations on your board. Copy what is on your board into your notebook.

What happens to your picture if we change the problem to say -2 instead of 2?

What does the negative say to do to each of the chips?

[Flash cards with addition problems, ask if answer is positive or negative and why.]

Write two addition problems for

R R R R R R
Y Y

Exploring Integers! Day 3

Bellringer:

A vanishing roller coaster drops 115 feet to the surface of the water then drops 30 feet before heading back up. What was the change in altitude of the roller coaster altogether?

As a group, illustrate this situation on your white board then write a math problem to represent your picture.

Be ready to explain your thinking.

Board Meeting Questions:

Looking at each other's boards, what is the same? different?

How does your picture of the roller coaster compare to your picture of an building elevator or the thermometer?

What can we add to our description of positive and negative? Put what is on your board into your notebook.

Yellow = Positive

Red = Negative

Divide your board into 4 sections. [Do one section at a time.]

Section 1: Model $-3 + 7$

What is the answer? How do you know?

Why is the answer positive?

How would this look on our elevator?

Section 2: Model $3 + -7$

What is the answer? How do you know?

Why is the answer negative?

How would this look on our elevator?

Section 3: Model $3 + 7$

What is the answer? How do you know?

Why is the answer positive?

How would this look on our elevator?

Section 4: Model $-3 + -7$

What is the answer? How do you know?

Why is the answer negative?

How would this look on our elevator?

What do you notice about our answers in each section? What

“Rules” might you use to add integers?

[Create a foldable for Adding Integers. Glue it in notebook.]

Evaluate $+30 + 70$

Prove your answer with a picture or an explanation.

Exploring Integers!

Day 4

Bellringer:

A football team starts play on the 20 yard line. The team completes a pass for a gain of 8 yards on first down. On second down, the runner loses 3 yards. What yard line is the ball on?

As a group, illustrate this situation on your white board then write a math problem to represent your picture.

Be ready to explain your thinking.

Board Meeting Questions:

Looking at each other’s boards, what is the same? different?

How does your picture of the football field compare to your picture of an building elevator, the thermometer or the roller coaster?

What can we add to our description of positive and negative? Put

what is on your board into your notebook.

Using Chips to Model Subtracting Integers

Yellow = Positive

Red = Negative

Divide your board into 4 sections.

[Do one section at a time.]

Section 1: Model $3 - 2$ [Be sure students are “taking away.”]

Why is our answer positive?

What does this look like on our elevator?

How can we rewrite this problem using addition?

Section 2: Model $2 - 3$

What does this look like on our elevator?

Do we have 3 yellow chips to give away?

How do we get 3 yellow chips to give away?

Why is our answer negative?

How can we rewrite this problem using addition?

Section 3: Model 3 - (-2)

Try solving this two different ways.

What do we have to give away?

Do we have two red chips to give away?

How do we get two red chips to give away without changing the value of 3?

What does this look like on our elevator?

What does the negative sign say to do?

How can we rewrite this problem using addition?

Section 4: Model -3 - 2

Try solving this two different ways.

Explain . . .

What "Rules" might you use to subtract integers?

What relationship is there between adding and subtracting integers? Copy what is on your board into your notebook.

Exit Ticket:

Evaluate $(-20) - 10$

Prove your answer with:

a picture, work or an explanation.

Challenge Problem:

I am on the elevator at a Floor with absolute value of 2. Where am I? How do you know?

Day 8 – Exploring Integers!

Bellringer:

Joe mowed lawns over the summer and earned \$11. He owes his dad \$30. If Joe gives his lawn money to his dad, does Joe still owe his father or does he have money left over?

As a group, illustrate this situation on your white board then write a math problem to represent your picture.

Be ready to explain your thinking.

Board Meeting Questions:

Looking at each other's boards, what is the same? different? What

can we add to our description of positive and negative? Put what is

on your board into your notebook.

[Do station work, review, or practice.]

Day 5

Bellringer:

Illustrate each problem in two different ways:

$$-3+4$$

$$-3-4$$

As a group, illustrate these problems on your white board
Be ready to explain your thinking.

Board Meeting Questions:

Looking at each other's boards, what is the same? different? How do
you know if your answers make sense?

Put what is on your board into your notebook.

Using Chips to Model Multiplying Integers

Yellow = Positive

Red = Negative

Defining "Negative".

Put 2 positive chips on your board.

Now change your picture to show -2 (do not add any other chips).

What did you do to the chips on your board?

What does the negative sign say to do? [Do the opposite]

How do I read "-2"? What is another way to read it?

[Negative 2 or the opposite of 2]

What would a picture of $-(-2)$ look like? Why?

Add the meaning of "-" to your concept map.

Divide your board into 4 sections. [Do one section at a time.] Section 1:

Model $2i3$

How do we read this problem? [2 sets of 3]

What does this look like on our elevator?

Section 2: Model $2i(-3)$

How do we read this problem? [2 sets of -3]

What does this look like on our elevator?

Section 3: Model $-2i3$

How do we read this problem? [the opposite of 2 sets of three]

How can we rewrite this problem? [$-(2i3)$]

Section 4: Model $(-2)i(-3)$

How do we read this problem? [the opposite of 2 sets of -3]
How can we rewrite this problem? [$-(2i-3)$]

What did we observe about multiplying integers? What was the same in all of our answers?
What was different?
What pattern did you see?
What “rules” can we write for multiplying fractions? Write rules and board work into your notes.

Use flash cards to practice “positive or negative”.

Exit Ticket:

Write and solve a problem for
“The opposite of 4 sets of 2”.

Exploring Integers!

Day 7

Bellringer:

Geordi took 3 days to climb down a 33 km mountainside. If he walked the same distance each day, what was his daily change in altitude?

As a group, illustrate this situation on your white board then write a math problem to represent your picture.
Be ready to explain your thinking.

Board Meeting Questions:

Looking at each other’s boards, what is the same? different? Where is zero in your picture? What does it represent?

Put what is on your board into your notebook.

Using Chips to Model Subtracting Integers

Yellow = Positive Red = Negative

Divide your board into 4 sections. [Do one section at a time.]

Section 1: Write $2i3=6$ from yesterday.

Rewrite this problem as a division problem.
Illustrate with chips.

Does your answer make sense? Why or why not?

Section 2: Write $2i(-3)=-6$ from yesterday.

Rewrite this problem as a division problem.
Illustrate with chips.
Does your answer make sense? Why or why not?

Section 3: Write $-2 \div 3 = -6$ from yesterday.
Rewrite this problem as a division problem.
Illustrate with chips.
Does your answer make sense?

Section 4: Write $(-2) \div (-3) = 6$ from yesterday.
Rewrite this problem as a division problem.
Illustrate with chips.
Does your answer make sense?

What did we observe about dividing integers? What pattern did you see?
What “rules” can we write for dividing fractions? Write rules and board work into your notes.

Use flash cards to practice “positive or negative”.

Exit Ticket:

Create a foldable with rules for adding, subtracting, multiplying and dividing integers. Be sure to include examples to help you remember.

**Exploring Integers!
Day 8**

Bellringer:

Eddie played several rounds in a miniature golf tournament. His score for the tournament was 16 under par (or -16). Each round he scored 2 under par. How many rounds did he play?

As a group, illustrate this situation on your white board then write a math problem to represent your picture.
Be ready to explain your thinking.

Board Meeting Questions:

Looking at each other’s boards, what is the same? different? Where is zero in your picture? What does it represent? Put what is on your board into your notebook.