



LESSON 5.3a
Two-Color Counters

7.NS.1a
7.NS.1b

Objective Adding Integers, Part II

Warm-Up



Use a number line to determine each sum. Then write a sentence to describe the movement you used on the number line to compute the sum of the two integers.

1. $-2 + 1$

2. $-5 + 8$

3. $-2 + (-3)$

4. $4 + (-6)$

GETTING STARTED

Creating Zero

Use a number line to illustrate how the sum of two numbers can be zero.

1. Write 3 examples of number sentences that sum to zero and draw the number line models to support your solutions.

2. What pattern do you notice?

3. Describe a real-life situation in which two numbers would sum to zero. Write the number sentence that could be used to represent the situation.



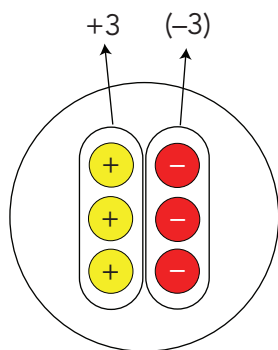
Addition of integers can also be modeled using two-color counters that represent positive (1) charges and negative (2) charges. One color, usually red, represents the negative number, or negative charge. The other color, usually yellow, represents the positive number, or positive charge. In this book, gray shading will represent the negative number, and no shading will represent the positive number.

= -1

= +1

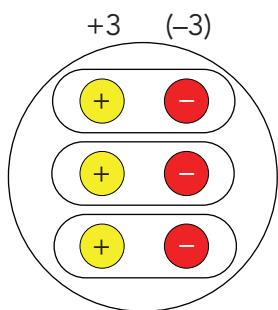
WORKED EXAMPLE

You can model the expression $3 + (-3)$ in different ways using two-color counters:



$3 + (-3) = 0$

Three positive charges and three negative charges have no charge.



$3 + (-3) = 0$

Each positive charge is paired with a negative charge. Each pair of positive and negative charges has no charge.

1. What is the value of each and pair in the second model?

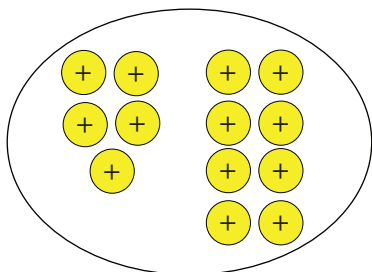
2. Describe how you can change the numbers of and counters in the model but leave the sum unchanged.



Let's consider two examples where integers are added using two-color counters.

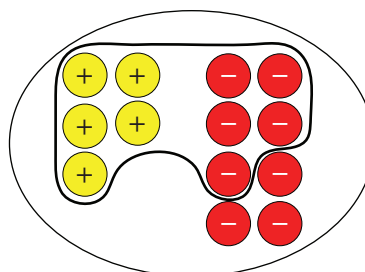
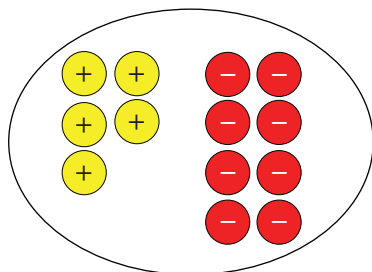
WORKED EXAMPLE

Example 1: $5 + 8$



There are 13 positive counters in the model. The sum is 13

Example 2: $5 + (-8)$



There are five pairs
The value of those pairs is 0.

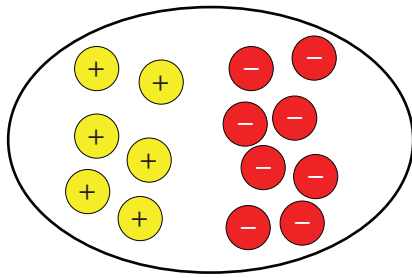
There are 3 or negative counters remaining.

There are 3 negative counters remaining. The sum of $5 + (-8)$ is -3

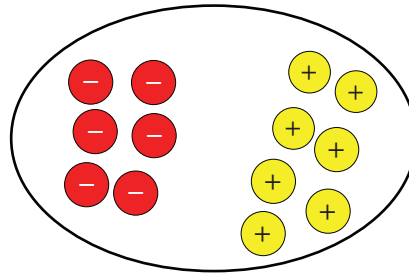
1. Create another model to represent a sum of -3 . Write the appropriate number sentence.
2. Share your model with your classmates. How are they the same? How are they different?

3. Write a number sentence to represent each model.

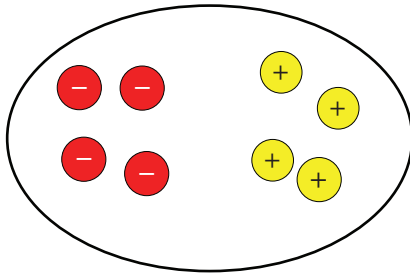
a.



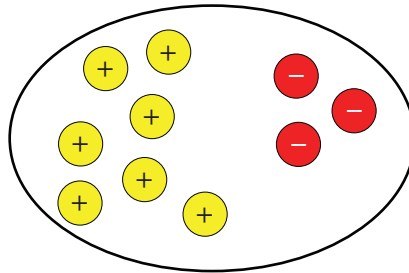
b.



c.

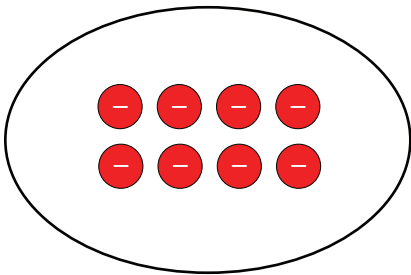


d.



4. Does the order in which you wrote the integers in your number sentence matter? How do you know?

The students were then asked to write a number sentence for the given model.



Ava



$$-8 + 0 = -8$$

Landon



$$-1 + (-7) = -8$$

5. Analyze the number sentences written by Ava and Landon.

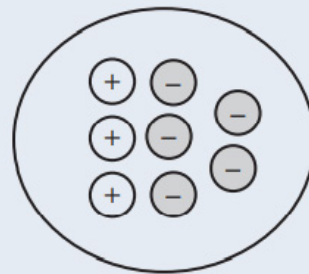
a. Explain why both number sentences are correct.

b. Write an additional number sentence that could describe the model.

6. Write each number sentence in Question 5 a second way.

Ava and Landon used two-color counters to represent the number sentence $3 + (-5)$.

7. The students placed the same counters on their desks, but they reported different sums. Ava reported the sum as 8 and Landon said the sum was -2 . Use the model to explain who is correct. What was the error made by the incorrect student?



**LESSON 5.3a**
Two-Color Counters**Objective****Adding Integers, Part II****Review**

Use a number line to determine each sum.

1. $-3 + 4$
2. $-3 + (-4)$

Calculate the sale price of each item.

3. A pair of headphones is on sale for 15% off the original price of \$305.
4. A hoverboard is on sale for 10% off the original price of \$247.50.

Solve each proportion.

5. $\frac{3}{4} = \frac{x}{18}$
6. $\frac{5}{8} = \frac{21}{x}$

