

LESSON 1

Objective

Add integers.

Common Core State Standards

- **7.NS.1b** Understand $p + q$ as the number located a distance $|q|$ from p , in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.

The Number System

Add Integers I

Addition is the same for whole numbers and integers—the grouping together of quantities. Modeling with different colors helps students to perform operations with positive and negative numbers. As students learn the rules for working with integers, they should make the connection between the models they build and the rules so that manipulating integers is not arbitrary.

Try It! Perform the Try It! activity on the next page.

Talk About It

Discuss the Try It! activity.

- **Ask:** After you model the problem with Two-Color Counters, why do you rearrange them to form red-yellow pairs? What does a red-yellow pair represent in terms of yardage? Students should recognize that one yard lost (red) plus one yard gained (yellow) is a net change of zero, so a red-yellow pair represents no gain or loss.
- **Ask:** Is the sum of two negative numbers always negative? Model an example to justify your answer.

Solve It

Reread the problem with students. Since $12 > 5$, the team gained more yards than it lost. Since $12 - 5 = 7$, they gained 7 more yards than they lost. So their net yardage is 7 yards. Have students write $-5 + 12 = 7$ and explain how this equation relates to the problem.

More Ideas

For other ways to teach about adding integers—

- Have students use Centimeter Cubes and 1-cm Number Lines (BLM 3) to add pairs of integers—two positive numbers: $2 + 6$, two negative numbers: $-1 + (-5)$, and a positive number and negative number: $-9 + 2$ or $8 + (-4)$. Suggest that students use red cubes for negative numbers and yellow cubes for positive numbers.
- Ask students to write their own number sentences with positive and negative numbers and use Color Tiles to model the sentences and show that a positive number plus a negative number can be positive, negative, or zero.

Formative Assessment

Have students try the following problem.

The morning temperature of -9°F is expected to rise 10 degrees by noon. What is the expected noon temperature?

- A. -19°F B. -1°F C. 1°F D. 19°F

Try It! 15 minutes | Pairs

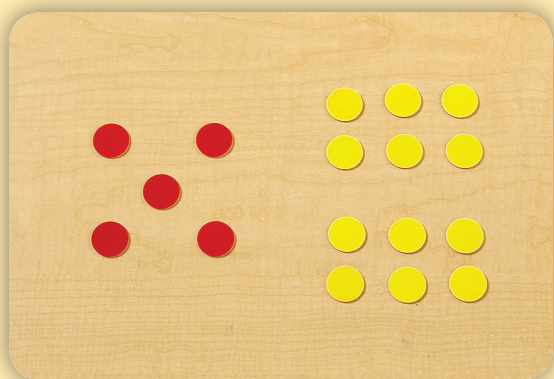
Here is a problem about adding integers.

A football team lost 5 yards on one play and then gained 12 yards on the next play. What was the team's net yardage on the two plays?

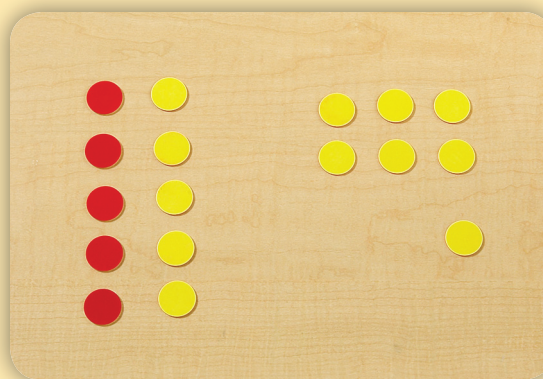
Introduce the problem. Then have students do the activity to solve the problem. Distribute the materials.

Materials

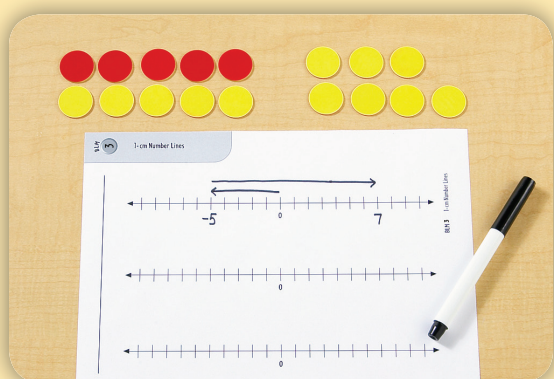
- Two-Color Counters (at least 20 per pair)
- 1-cm Number Lines (BLM 3; 1 per pair)



1. Say: Each red counter represents one yard lost. Each yellow counter represents one yard gained. Place counters to model this problem. Students place 5 red counters and 12 yellow counters.



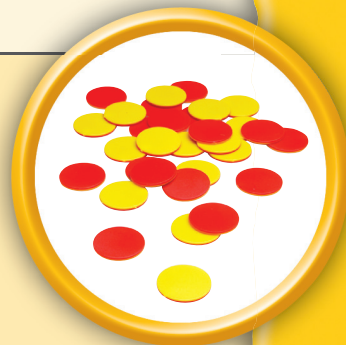
2. Say: Move counters so that each red counter is paired with a yellow counter. **Ask:** What number does each red-yellow pair represent? How many yellow counters are left? Students form 5 pairs, each representing 0. There are 7 yellow counters left, representing a net gain of 7 yards.



3. Say: Now use a number line to solve this problem. Starting at 0, draw a segment 5 units to the left. From -5, draw a segment 12 units to the right. **Ask:** At what number do you end? Students draw the two segments and end at 7. Help students recognize that the overlapping parts of the lines are equivalent to red-yellow pairs of counters.

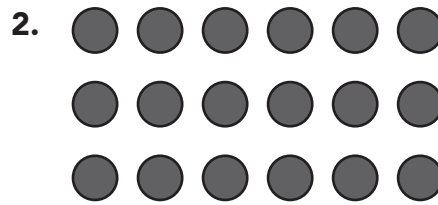
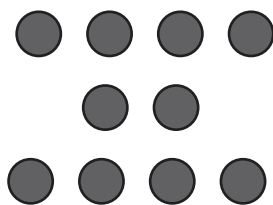
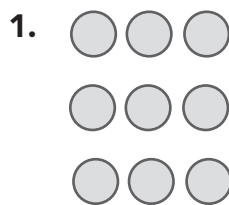
Look Out!

Students may confuse negative signs with minus signs. Have students write the problem $-5 + 12 = 7$. Then speak the correct words: *negative five (not minus five) plus twelve equals seven*. On a number line, show students that -5 and 5 are opposites. They are both 5 units from 0, but in opposite directions.



Use Two-Color Counters to model each addition problem. Make pairs of red and yellow counters. Find the sum.

(Check students' work.)



$$9 + (-10)$$

 -1

$$-18 + 9$$

 -9

Using Two-Color Counters, model each addition problem. Sketch the model. Find the sum.

3. $7 + (-4)$

4. $-12 + (-3)$

 3

 -15

Find each sum.

5. $11 + (-6)$

 5

6. $-5 + (-18)$

 -23

7. $-4 + 13$

 9

8. $9 + (-21)$

 -12

9. $-6 + (-14)$

 -20

10. $-3 + (-18)$

 -21

11. $15 + 9$

 24

12. $26 + (-50)$

 -24



Answer Key

Challenge! Explain how to add two integers if one is a negative number and one is a positive number. When will the sum be negative? When will the sum be positive?

Challenge: (Sample) You actually subtract the numbers, ignoring the signs, and the answer will have the same sign as the number with the greater value (ignoring the negative signs).

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Name _____

