

# Right or Left?



Name: \_\_\_\_\_

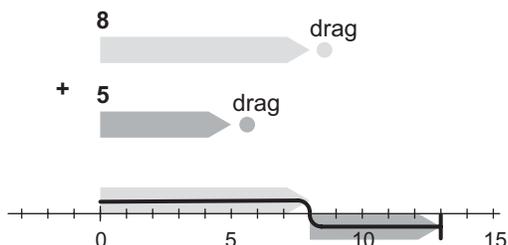
In this activity you'll add and subtract integers on a number line.

## EXPLORE

1. Open **Right or Left.gsp** and go to page "Addition." If necessary, drag the circles to model the addition problem  $8 + 5$ .

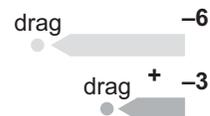


2. Press *Add*. Observe the model in action.



3. How does the final position of the arrows on the number line show the answer for this addition problem?
4. Press *Reset*. Drag the circles to model  $2 + 6$ .
5. This time, press *Show Steps*. Then press each numbered button in order to see the model step by step.
6. Drag the circles to model another addition problem using only positive integers. Record your problem and its result.
7. How do the two top arrows in the sketch relate to the two bottom arrows?

8. Model  $-6 + (-3)$ . What is the sum?



9. Model two more addition problems using negative integers. Record each problem and its result.

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continued



10. How is adding two negative integers similar to adding two positive integers?  
How is it different?

11. Can you add two negative integers and get a positive sum? Explain.

12. Model the following eight addition problems. Record each problem and its answer.

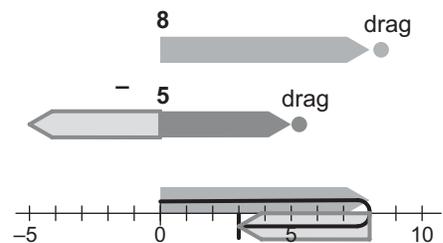
$\begin{array}{r} 7 \\ + (-4) \\ \hline \end{array}$	$\begin{array}{r} (-4) \\ + 7 \\ \hline \end{array}$
$2 + (-5)$	$-2 + 5$

13. When you add a positive and a negative integer, how can you look at the numbers and tell whether the answer will be positive or negative?

Now you'll explore a subtraction model.

14. Go to page "Subtraction." If necessary, drag the circles to model the subtraction problem  $8 - 5$ .

15. Press *Subtract*. Observe the model in action.

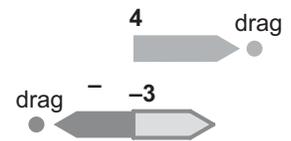


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continued



16. During the animation, what happens to the arrow for the integer 5? What does this show?
17. Press the *Reset* button. Then drag the circles to model  $2 - 6$ .
18. This time, show the animation step by step. Describe in your own words what the step 3. *Make Inverse* does.
19. Drag the circles to model two more subtraction problems that use positive integers but have a negative result. Record each problem and its result.
20. If both integers in a subtraction problem are positive, how can you tell whether the answer will be positive or negative?
21. Model  $4 - (-3)$ . What's different about the step 3. *Make Inverse* this time?
22. Model two more problems in which the first integer is positive and the second integer is negative. Record each problem. What do these models have in common?
23. Model three problems in which the first integer is negative and the second integer is positive. Record each problem. What do these models have in common?



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continued



24. Model the following eight subtraction problems. Record each problem and its answer.

$\begin{array}{r} 7 \\ - \\ -4 \end{array}$	$\begin{array}{r} -4 \\ - \\ 7 \end{array}$
$2 - (-7)$	$-2 - 7$
$-6 - (-5)$	$-5 - (-6)$

25. For each subtraction problem in step 24, write an addition problem that has the same first integer and the same answer. What do you notice?

## EXPLORE MORE

26. Go to page "Explore More." You will see two number lines, one that shows the sum  $a + b$  and another that shows the difference  $a - b$ . With the numbers hidden, drag  $a$  and  $b$  and observe the behavior. How do addition and subtraction behave similarly? How do they behave differently?

27. On each number line, use your number sense to figure out where zero must be located. Drag a gold arrow to mark this location, and then press *Show Numbers* to check your answer.