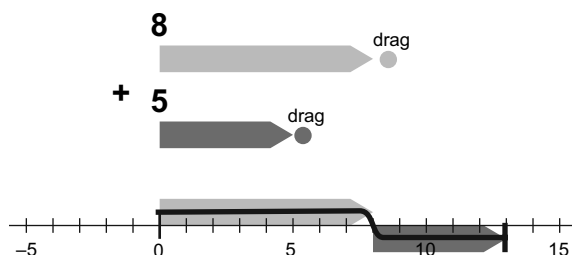


In this activity you'll add integers using an animated Sketchpad model.

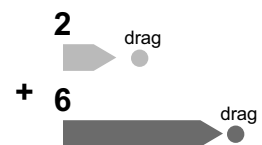
## INVESTIGATE

1. Open links/add-sub-integers. This sketch models the addition problem  $8 + 5$ .
2. Press the *Present All* button to see the model in action.



**Q1** How does the final position of the arrows show the answer for  $8 + 5$ ?

3. Press the *Reset* button, and then drag the circles to model  $2 + 6$ .



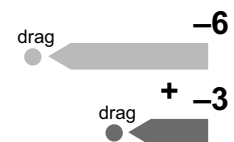
4. This time, show the animation step by step: Press the *Show Steps* button, and then press each numbered button in order.

For each problem, press the buttons to show the result.

**Q2** Drag the circles and press the buttons to model two other addition problems using only positive integers. Record each problem and the result.

**Q3** How do the two upper arrows in the sketch relate to the two lower arrows?

**Q4** Model  $-6 + (-3)$ . What's the sum?



**Q5** Model two more addition problems using negative integers. Record each problem and its result.

**Q6** How is adding two negative numbers similar to adding two positive numbers? How is it different?

**Q7** Can you add two negative numbers and get a positive sum? Explain.

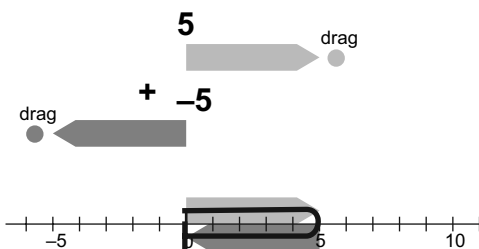
**Q8** Model the following eight problems. Record each problem and its answer.

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

**Q9** 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?

**EXPLORE MORE**

**Q10** Model four problems for which the sum is zero. Make the first number positive in two problems and negative in two problems. Write down the problems you used. What must be true about two numbers if their sum is zero?



**Q11** When you add two numbers, does the order matter? In other words, is  $-3 + 5$  the same as  $5 + (-3)$ ? Using the sketch, explain why your answer makes sense.