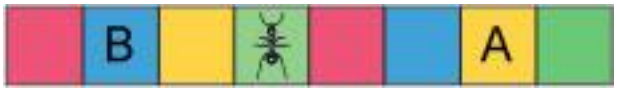
Name: _____ Date: _____

Student Exploration: Number Line Frog Hop

Vocabulary: add, difference, equation, subtract, sum

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)
Lucy is playing a board game. She can move left and right along the board. The picture shown on the right shows where her playing piece (the ant) is on the board right now.

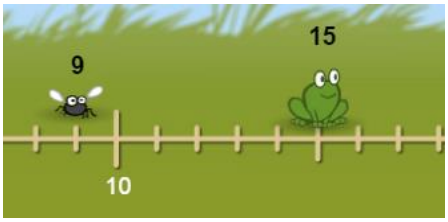


1. How many squares to the right should she move to reach A? _____

2. After she gets to A, how many squares to the left should she move to reach B? _____

Gizmo Warm-up
In the *Number Line Frog Hop* Gizmo, Fred the Frog is hungry for his favorite food – flies. You can help Fred catch flies by giving him directions.

Notice that Fred is currently at 15 on the number line and that there are flies at 9, 25, and 27.



1. Click the **Add** button. What happened?

   _____

2. Change Fred's **Jump size**. (You can use the up and down arrows, or you can click in the box, type a new number, and hit **Enter**.) Click **Add**. How does Fred's jump change?

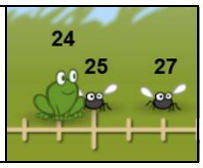
   _____

3. Now click the **Subtract** button. What happened? _____

4. See if you can catch the three flies. Don't forget that you can change the **Jump size**.

5. Click and drag Fred to 10. Click **Add fly**, and drag the new fly to 15. What should Fred do to catch this fly?

   _____

Activity A: **Snack attack**	Get the Gizmo ready: • Click the **Reset** button. • Make sure that the **Jump style** is **Single jump**.	

Help Fred the Frog catch flies for his mid-morning snack.

1. Drag Fred to 5. Add three flies and drag them so that they are at 11, 18, and 22.

   A. Enter 6 as the **Jump size**. Click **Add**. What addition equation is shown for the hop?

   _____

   B. How far do you think Fred needs to jump to catch the next fly? _____

   C. Set the **Jump size** to that number and click **Add**. Did Fred catch the fly? (If not, drag him back to 11 and try a different number.) What equation is shown for his hop?

   _____

   D. Fred is now at 18, and the next fly is at 22. Fill in the blank: 18 + _____ = 22.

   E. Test your answer to D. Were you right? _____ (If not, drag Fred to 18 and try again.)

2. Now Fred is going to catch flies by subtracting. Drag him to 28. Add flies at 21, 17, and 9.

   A. Enter 7 as the jump size. Click **Subtract**. What equation is shown?

   _____

   B. How far do you think Fred needs to jump to catch the next fly? _____

   C. Set the **Jump size** to that number and click **Subtract**. Did Fred grab the fly? (If not, drag him back to 21 and try a different number.) What equation is shown for his hop?

   _____

   D. Fred is now at 17, and the last fly is at 9. Fill in the blank: 17 – _____ = 9.

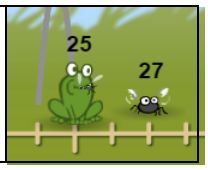
   E. Test your answer to D. Were you right? _____ (If not, drag Fred to 17 and try again.)

3. Fred the frog is hanging out at 13. He decides to jump a distance of 8.

   A. Where might Fred land? _____ (Hint: There are two possible answers!)

   B. Write two different equations that show where Fred could land.

   _____

Activity B: **Fred gets fed**	Get the Gizmo ready: • Click the **Reset** button. • Make sure that the **Jump style** is **Single jump**.	

Fred the Frog has been exercising and is ready to start taking some longer jumps.

1. Drag Fred to 1. Set the **Jump size** to 10.

   A. Click **Add** two times. To the right, write the equations for these two jumps. _____ _____

   B. Now drag Fred to 2. Click **Add** two times. Write the equations for these two jumps. _____ _____

   C. Move Fred to 6. Click **Add** twice and write the equations for these two jumps. _____ _____

   D. If Fred starts at 9 and jumps 20 units to the right, where will he land? _____ Use the Gizmo to check your answer.

2. Drag Fred to 5. Change the **Jump style** to **Tens then ones**. Add a fly and drag it to 17.

   A. Imagine that Fred jumps 10 to the right. Where would he land? _____

   B. After that jump, how far away would he be from the fly at 17? _____

   C. Set the **Jump size** to 12. Click **Add** and watch. Notice that in **Tens then ones** mode Fred's jump happens in two parts. How long are the two parts? _____ and _____

3. Drag Fred to 7. Set the **Jump size** to 23.

   A. Before you click **Add**, write where you think Fred will land. _____ (Hint: To do this in your head, think of 23 as a jump of 20 followed by a jump of 3.)

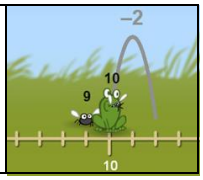
   B. Place a fly where you think Fred will land. Click **Add**. Did Fred catch the fly? _____

4. Drag Fred to 29. He is going to jump 24 units to the *left*.

   A. First, imagine that Fred only jumps 20 units to the left. Where would he land? _____

   B. Now picture the full jump of 24 to the left (starting on 29). Where will he land? _____

   C. Set the **Jump size** to 24. Place a fly where you think he will land. Click **Subtract** and watch what happens. Did Fred get fed? _____

Activity C: **Fly fetch**	Get the Gizmo ready: • Click the **Reset** button.	

Fred the Frog is hungry again. Help him catch dinner in the fewest possible moves.

1. Click **Add fly** four times. Then use addition and subtraction to help Fred catch all the flies. (No dragging Fred around – you can only move him by making him jump!) Write down the equations of his four jumps below.

   _____ _____

   _____ _____

2. There is a way to catch two flies in one move! Click **Reset**. Add flies at 25 and 28.

   A. If Fred starts at 15 and jumps 10 units to the right, where would he land? _____

   B. If Fred then jumps to the right by 3 more, where would he land? _____

   C. Set **Jump style** to **Tens then ones**. Enter a **Jump size** of 13 and click **Add**. What happened?

   _____

3. Leave Fred at 28. Add flies at 21 and 11. Set the **Jump style** to **Ones then tens**. There's a way to catch both flies in one jump. Explain how.

   _____

   _____

4. Click **Reset**. Click **Add fly** four times. See if you can place the flies so that Fred can catch all four flies in only two moves.

   A. Where did you place the flies? _____

   B. Write the equations for the two jumps Fred made to catch the four flies.

   _____ _____

5. Challenge: Click **Reset**. Click **Add fly** six times. Without dragging Fred or any of the flies around, see if you can catch all six flies in less than 6 moves.