Task: Froggy Falls in a Well	**2nd Grade**

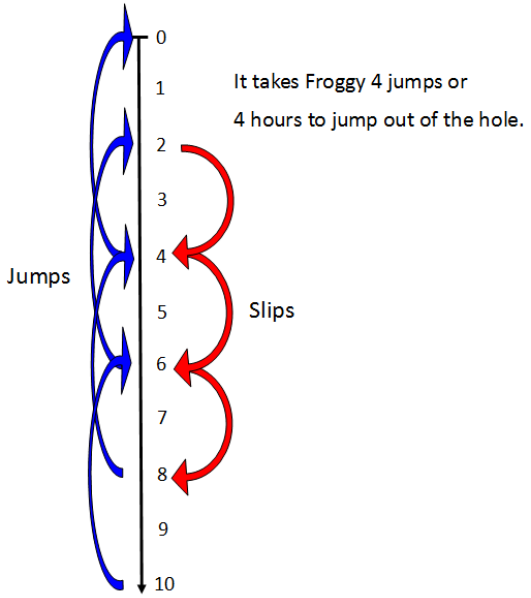
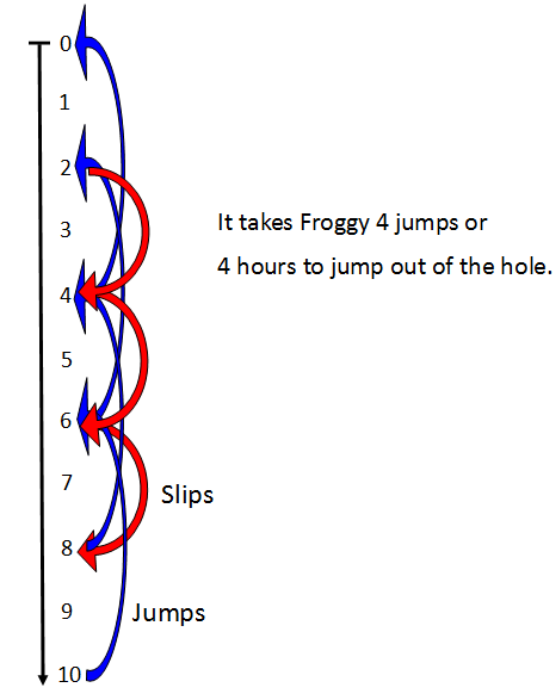
Froggy is jumping to visit his friend. A car comes down the road. He jumps to the side and falls in a well. The well is 10 feet deep. Each hour Froggy can jump up 4 feet. Each time he stops to rest, he slips back 2 feet. How many hours does it take him to jump out of the well? Show your thinking on the number line. Explain your answer in words.

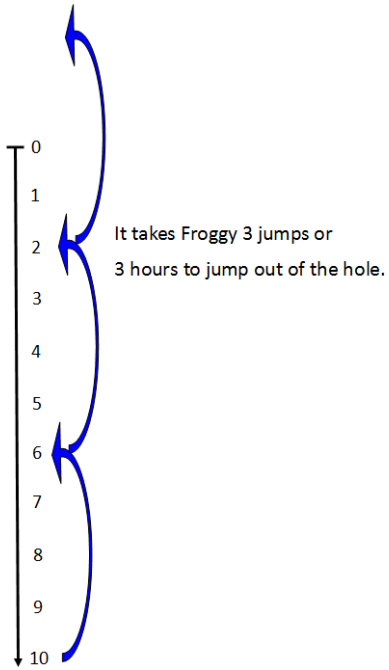
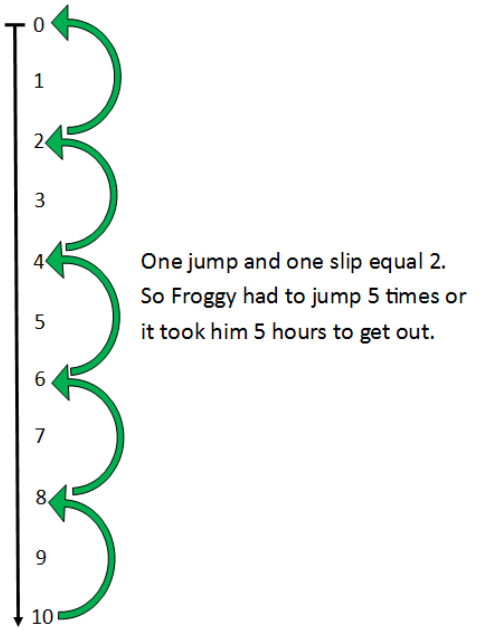
Teacher Comments:
This activity is designed to allow students the opportunity to work with addition and subtraction on a number line. Manipulatives should be provided (i.e. life –size tape line on the floor that students may jump on, number line drawn on paper with manipulative "Jumper".)

Common Core State Standards for Mathematical Content	**Common Core State Standards for Mathematical Practice**
2.MD.B.5. Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. 2.MD.B.6. Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.

Essential Understandings/NCTM Resources

- Addition and subtraction of whole numbers are based on sequential counting with whole numbers.
- Subtraction has an inverse relationship with addition.
- The context of a problem situation and its interpretation can lead to different representations.

Explore Phase	
Possible Solution Paths	**Assessing and Advancing Questions**
	Assessing Questions: • Why are there arrows on both sides of the number line? • What do the different colored arrows represent? Advancing Questions: • Can you make a number sentence that would match this problem? What would it look like? • Are there other ways to represent this problem?
	Assessing Questions: • Tell me about your number line. • What do the different colored arrows represent? Advancing Questions: • Can you make a number sentence that would match this problem? What would it look like? • Are there other ways to represent this problem?

Possible Student Misconceptions	
	Assessing Questions: • Tell me about your number line. • What does the number 2 in the problem represent? Advancing Questions: • How can you show the distance Froggy slips back after each jump? • How can you represent the jumps differently than the slips?
	Assessing Questions: • What do you mean 1 jump and 1 slip equal 2? • Another student told me it only takes 4 jumps, because the last jump he doesn't slip down. What do you think they mean by that? Advancing Questions: • Can you make a general rule for this problem and the extension problems? • Are there other ways to represent this problem? • Can we make a number sentence that would match this problem? What would it look like?

Entry/Extensions	Assessing and Advancing Questions
If students can't get started…	Assessing Questions: • What do the numbers in the problem represent? • What is the problem asking you to find? Advancing Questions: • Can you draw a number line to represent the jumps Froggy made? • How can you represent the jumps differently than the slips?
If students finish early…	**Extension:** What if Froggy was stronger and only slipped back 1 foot each hour? How long would it take him to get out of the well? **Extension:** What if Froggy only jumped 3 feet each time and slipped back the original 2 feet? **Extension:** What if Froggy only jumped 3 feet each time and slipped back the 3 feet? What would happen?
Discuss/Analyze	
Whole Group Questions	
• Can you make a general statement describing the relationship between the jumps and the slips? • Can we make a number sentence that would match this problem? What would it look like? • How can you tell which are jumps and which are slips on your number line? • Are there other ways to represent this problem? • For those that completed an extension problem, how were they the same and different than the original problem?	