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Grade Level 2nd Grade
Content Area Math
Date for Implementation: 2/27/14
Lesson Title *Shark Swimathon*
Whole Class Lesson

Goal:

Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. (MCC.2.NBT.5)

Content Objective:

Students will use addition and/or subtraction to solve story problems, based on the book *Shark Swimathon*, and defend their strategies.

Language Objective:

Given sentence stems, students will orally explain their strategy by describing their sequence of steps.

Mathematical Practices:

Make sense of problems and persevere in solving them (MP1)
Construct viable arguments and critique the reasoning of others (MP3)
Model with mathematics (MP4)
Attend to precision (MP6)

Assessment

Formative Assessment Tasks:

While the students are working independently, I will walk around and conduct short interviews with all the kids. I will ask them questions like:

- What strategies did you use? How did you decide what to do to solve the problem?
- Were you able to write a number sentence, draw a picture, or make a model that shows your thinking?
- Can you explain your work to me? How did you solve the problem?
- Is there a way that you can check your answer to see if it is correct? How would you do that?

After the students have completed the activity, I will ask them to describe their various strategies they used to solve the problem. I will get an idea of the students understanding both through individual discussions and during the class discussions.

Summative Assessment Tasks:
I will look at their Shark Swimathon recording sheets to gauge my students' understanding of two-digit subtraction and/or addition.

Materials Needed
- *Shark Swimathon* by Stuart Murphy
- 30 Shark Swimathon Story Problems recoding sheets
- Math manipulatives (Base ten blocks, Unifix cubes, place value mats, hundreds charts, etc.)

Differentiation:
1. I will use number sets to make the problems accessible to all my students. One set of numbers will make the story problem slightly easier because the numbers won't be as large and they will lend themselves to using 10s to add and/or subtract. The second set of numbers will be slightly greater, but the students will be able to use their doubles facts to solve the problem or they can subtract without "trading" for ten ones. The final two sets of numbers will be the greatest and will need students to "regroup" or "trade" a ten for ten ones. Students will have the choice of which number set they would like to use so each child can adapt the story problem to his or her own needs.

2. For students who are having difficulty even with the easiest set of numbers, I will simplify the problem to a single-digit addition/subtraction problem. I will encourage the students to model the problem using blocks or pictures. Once the students feel comfortable with the single-digit problems, I will give them the option of trying one of the double-digit problems.

3. For students who finish early or need an extra challenge, I will have them write their own story problems based on the Shark story. They can either solve their own story problems or they can trade with a partner. Another option would be to have them write three new separation story problems: result unknown, start unknown, or change unknown. I will also encourage them to try and solve each problem at least two different ways.

4. I will support English Learners in the language objective by providing sentence stems for them to use while describing the sequence of steps used to solve the story problems.
    a. First, I _____.
    b. Next, I _____.
    c. Finally, I _____.

Instructional Sequence:

Introduction
1. I will call the students to the rug for a read aloud of *Shark Swimathon*. Before we read I will tell the students that this is a math book, so I want them to be paying

attention to where the math shows up in the story. While we read, I want them to be thinking about how they could model the math in the story using numbers, pictures, or words.

2. As I read I will stop occasionally to check in with the students about their math thinking. I will record their math on the board so that we can keep track of the sharks' laps just like they do in the book. I will ask them questions like:

    a. How many laps have the sharks already swam altogether?
    b. Have all the shark swam the same amount of laps?
    c. How many laps do they have to swim altogether?
    d. How many more laps do they need to swim to reach their goal?
    e. What strategy did you use to figure out the answer?
    f. Do we need to use subtraction?
    g. [Challenge Question] After Gill gets hurt, how many sharks are left? Do you think they will be able to swim 25 laps? How many laps does each shark need to swim?

3. After we finish reading the book I will have the students return to their seat and then I will tell them that for our math lesson today, we will be thinking about the sharks and how many laps they are swimming at their swim camp.

4. I will post this story problem on the board and have the class choral read it:

    a. *At swim camp, the team of sharks had to swim a total of _____ laps. If they have already swum _____ laps, how many more laps do they need to swim to reach their goal?*

5. I will remind the students that the blanks mean that those are spots we will fill in with numbers when it is time to solve the problem. Before I fill in the blanks with numbers, I will ask the students what they know about our story problem. I anticipate that they will tell me that the sharks have a goal to reach, they have already swam some of it, and they have to figure out how many more laps they need to swim to reach their goal.

6. I will then ask the students what kinds of strategies they will use to try and solve the problem. Again, I anticipate the students will say number sentences, hundreds chart, pictures, base ten blocks, etc.). I will have a couple students share out their ideas. If it doesn't come up, I will ask the students if they can use the base ten block like we did in the previous day's lesson where we traded a ten for ten ones.

7. I will tell the students that they will have a chance to solve this problem in a couple of minutes but I wanted to show them another story problem. We will choral read the story problem:

    a. *The sharks have been swimming for a while and have completed some laps. Then Coach Blue yells, "Only _____ more laps to go before you reach your goal of ____ laps!" How many laps have the sharks already completed?*

8. Once again, I will ask the students what we already know about the story problem and what we are trying to figure out. I will have students share out strategies for solving the problem.

9. Finally, I will ask the students to compare the two problems and ask "What is the same and what is different?"

10. Then I will show the students three number sets for each problem. I will remind them that just as they have done before, they can choose any one of the three number sets to complete the problem. The first number goes into the first blank and the second number goes into the second blank.

11. I will also tell the students that I will be asking them to explain the steps that they took to solve the problem. I will post the sentence stems on the board (*See Differentiation*). First I will read through all the sentence stems. Then I will model using the sentence stems with a sample problem. Then I will have the whole class practice the sentence frames out loud. Finally, they will practice using the sentence frames with a partner.

    a. 75 – 14 = 61
        i. First, I ___(subtracted 1 ten from 7 tens)__.
        ii. Next, I ___(subtracted 4 ones from 5 ones)_.
        iii. Finally, I ___(put my answers together to get 61)_.

12. I will then ask for questions.

Body

1. I will pass out recording sheets with both problems and number sets to the students. I will remind students that they can use any strategies or materials they like. I will set out Unifix cubes, place value mats, hundreds charts, and base ten blocks on the counter for the students to retrieve as needed.

2. First, I will check in with the ELLs in the class to make sure that they understand the story problem. I will ask if they need any clarification on the words. I will have them repeat the story problem to me in their own words to make sure they understand the task. If needed, I will model the story problem for them using blocks so that they understand.

3. Next, I will check in with the students who typically struggle with math. I will ask them to explain their thinking to me. If I notice they are having difficulty even with the easiest set of numbers, I will simplify the problem to a single-digit addition/subtraction problem. I will encourage the students to model the problem using blocks or pictures. Once the students feel comfortable with the single-digit problems, I will give them the option of trying one of the double-digit problems.

4. While the students are working independently, I will walk around and conduct short interviews with all the kids. I will ask them questions like:

     a. What strategies did you use? How did you decide what to do to solve the problem?

     b. Were you able to write a number sentence, draw a picture, or make a model that shows your thinking?

     c. Can you explain your work to me? How did you solve the problem? What did you do first/next/last?

     d. Is there a way that you can check your answer to see if it is correct? How would you do that?

5. I will take note of students who are using exemplary or unique strategies that I would like the rest of the class to see. I will ask these students if they would be willing to share their strategies with the class when we all meet together for our group discussion.

6. As students finish up, I will encourage them to try solving the problems with the other number sets, using multiple strategies, or I will give them the option of writing their own story problems to solve *(See Differentiation)*.

7. Once I notice that everyone has completed the two story problems, I will ring the chimes and call them all together.

Closure

1. I will invite the students who I selected previously to come up to the doc cam to show and explain their strategy. I will select the student with the simplest strategy to share first. The strategies will get increasingly complex as the students present. I will encourage the presenters to use the sentence stems to describe their sequence of steps.

2. After each presentation, I will ask the class if they can repeat or rephrase the strategy that was presented.

     a. Where did the students start?

     b. What did they do next?

3. I will record the summary of the strategies on the board. By the end of the presentations I want each process to be reflected through words, pictures, and an equation.

4. As a class we will discuss these questions:

     a. How are the strategies similar and how are they different?

     b. What did each student do to find the missing part of the unknown?

     c. Did the students use addition or subtraction to solve the problem?

     d. Did any of the students "trade" tens for ones to solve the problems?

5. I will tell the students that they have come up with many strategies for solving these subtraction problems and that they can use these strategies with other problems as well. I will encourage them to use different strategies or some that they haven't tried before next time we do math.

Shark Swimathon Story Problems

1. At swim camp, the team of sharks had to swim a total of _____ laps. If they have already swum _____ laps, how many more laps do they need to swim to reach their goal?
   (45, 20)   (50, 24)   (73, 38)   (112, 47)

2. The sharks have been swimming for a while and have completed some laps. Then Coach Blue yells, "Only _____ more laps to go before you reach your goal of _____ laps!" How many laps have the sharks already completed?
   (26, 50)   (46, 89)   (58, 93)   (66, 125)

Explaining Your Math Strategy

- First, I _____.

- Next, I _____.

- Finally, I _____.