

Oklahoma Panhandle State University
Math-Ese Workshop

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“Using Manipulatives
for Addition/Subtraction”

The student will learn to model
regrouping/borrowing when adding
and/or subtracting.

Nancy Lines

Name: Nancy Lines

Grade Level/Subject: 4th Grade Math

Topic: Regrouping/borrowing during addition/subtraction

Objectives:

The students will use straws to demonstrate borrowing while subtracting.

The students will be able to recognize and record their understanding of the value of a digit in each place before and during the borrowing process.

Objectives (P.A.S.S.)

Standard 2: Communication

3. Relate manipulatives to mathematical ideas

Materials:

Possible books to read for this lesson are: *One Guinea Pig Is Not Enough* or *Twenty Is Too Many* by Kate Duke, *One Grain of Rice* by Demi, or *Subtraction Action* or *Mission Addition* by Loreen Leedy.

Manipulatives needed are regular drinking straws and rubber bands. The straws must be cut in half. The single straw represents one. I then count ten straws and place a rubber band around them to represent 1 group of ten or 10. You can also take 10 groups of 10 straws and place a rubber band around them to represent 1 group of 100 or 100.

Introduction:

This lesson plan can be used when regrouping or borrowing during addition or subtraction. However, borrowing during subtraction will be the main focus of this lesson.

Begin by reviewing their knowledge of place value and the actual value of each digit in the places. We will focus on subtraction as "something when away".

Instructional process:

1. After reading any of the above picture books, ask the students to write and solve a two-digit subtraction problem on their boards that does not require borrowing. Ask a few students to share their problems and explain why borrowing was unnecessary.
2. Put a problem on the board that requires the students to borrow. Example: $42 - 25 = \underline{\hspace{2cm}}$
3. Place below the problem the straw manipulatives illustrating the number 42. (2 groups of 10 straws and 2 single straws) It works great if you can place these straws on a stand directly below the problem.
4. Together discuss each step as you solve the problem.
5. When subtracting the digits in the ones place ask, "Can we subtract 5 from 2?" Show them that they only have a set of 2 straws, and they must take 5 straws from them. Ask them what to do next.
6. We must go over to the tens column that contains 4 sets of ten straws and borrow one of them. Ask, "How much are we taking?" They need to see that the 1 set of 10 is actually 10 straws. Ask, "When I take this group of 10 straws, how many groups of 10 straws will I have left?"
7. When I move the 1 set of 10 straws to the ones column, I remove the rubber band and count the straws with the students. Ask, "How many straw will I now have in the ones column?" Remind them that they already have 2 straws there. "Can I now subtract 5 straws from this group of straws?"
8. Next, go to the tens column to subtract. Ask if you can subtract this column without regrouping?
9. Repeat with a different problem if necessary.
10. Ask them to write a subtraction problem that requires borrowing on their boards.
11. Give them straws to illustrate their subtraction problem to a partner.

Closure:

The group of 2 can now write a new subtraction problem requiring borrowing. They will demonstrate the steps to the class using the straw manipulatives.

Give them a subtraction worksheet that includes some borrowing.

Assessment:

The students will be assessed by their demonstration to the class and the accuracy of their completed worksheet.

Modifications:

Advances Students: Ask the students to demonstrate using other manipulatives. You could also use 3-digit problems. They could also be asked to write a story problem instead of just write a problem.

Special Needs: Stay close to monitor if they need help managing the straws. Start with smaller numbers. Reduce the problems they will be required to answer.

Reflection:

I have used \$1, \$10, and \$100 dollar bills and base 10 model manipulatives to teach this same concept. The straws seem to be the easiest for my students to understand or "see". When I am using the straws to represent the actual numbers they are using and how we got them, I hear my students say, "Oh, I get it now!!!" It may take several examples for them to "see" it.

These are the type of manipulatives any school can afford!!!!