

[17] Subtraction with Regrouping

Regrouping in a subtraction problem is the same as **borrowing**.

$$\begin{array}{r} 42 \\ -15 \\ \hline \end{array}$$

In this example, since 15 is smaller than 42, it can be subtracted from 42; however, since 5 is bigger than 2, it is necessary to take 1 ten from the 4 tens and add it to the 2. The 5 is then subtracted from 12.

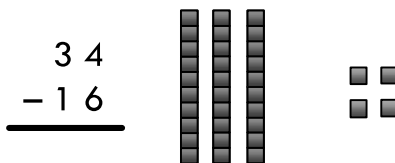
$$\begin{array}{r} 3\cancel{4}2 \\ -15 \\ \hline 27 \end{array}$$

When you teach subtraction with regrouping, it is very helpful to use manipulatives. When you write the problem, keep the digits in neat columns and leave some space between each column. It is also good to start out with only 2-digit numbers.

Teaching Ideas

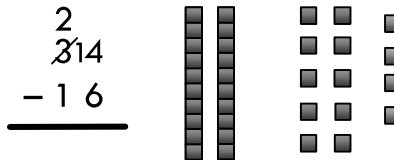
Using manipulatives

Take some manipulatives with both 10s and 1s. (See [16] Addition with Regrouping, page Op:26, for examples of manipulatives to use.) Write out a subtraction problem, make the top number with manipulatives, and put it next to the problem.



Say, "Let's take 16 away from 34. First we subtract the ones. Give me six ones."

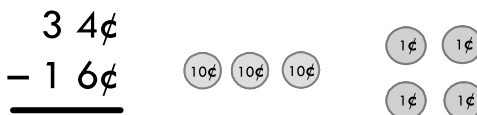
Since your child doesn't have six ones, he or she will must trade one of the 10 sticks for ten ones. Then have your child count how many 10 sticks also how many ones there are.



Show the child how to write down what was done with the manipulatives. First, cross off the 3 and write a 2, and then add a 1 next to the 4 to show how many ones there are now. Stress that when a number gets crossed out, always write a number above it that is 1 less than the one crossed out and then write a 1 between the crossed-out number and the number to its right.

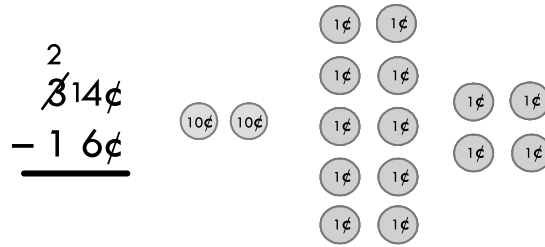
Using money

You can also use money to demonstrate regrouping. Start with pennies and dimes. In the case of 34¢ - 16¢, write the problem and set out the money.



Ask your child to give you six cents. See if he or she figures out that a dime needs to be exchanged for ten pennies. If not, then show how to make the exchange.

Then have your child count the remaining coins, starting with the dimes.



Cross out the 3 and write a 2 above it to show that only 2 dimes are left. Write the 1 next to the 4 to show that there are now 14 pennies. Tell your child that when the dime is traded for 10 pennies, it is shown by crossing out the number in the 10's place (the dime) and writing a number that is 1 less, and then putting a 1 between the 10's (dime) and 1's (penny) place, changing the 4 to 14. Then do the subtraction.

Give your child lots of practice using dimes and pennies or other manipulatives. When the 2-digit problems become easy to do, expand to 3 and 4-digit numbers, either with or without manipulatives.

Special Cases

There are three tricky situations you need to be sure to cover: borrowing from zero, borrowing from more than one zero, and two step borrowing.

Borrowing from zero

You need to teach your child that you cannot borrow (or regroup) from zero.

NOTE: Many math books use the term “regroup” instead of “borrow”, because when you borrow something you intend to give it back, whereas in subtraction nothing is given back. There is logic to that argument; however, “regroup” is not a term that is used in normal language by most children, whereas “borrow” is a familiar term. You can use either term — it isn't that important, and it is probably good to expose your child to both. In subtracting from zero, however, the “borrow” concept is usually easier for a child to understand.

Write the following problem, leaving plenty of space between columns.

$$\begin{array}{r} 201 \\ - 59 \\ \hline \end{array} \qquad \begin{array}{r} \$2.01 \\ - \$.59 \\ \hline \end{array}$$

- Have your child make the number 201 with manipulatives, or \$2.01 with money (use whichever works best with your child). Say, “Let’s subtract the ones (or pennies) first. Take nine ones (pennies) away.”
- When the child cannot do this, say, “Then let’s borrow from the tens (dimes).” Don’t let him or her trade for the 100’s (dollars) — the ones (pennies) can only exchange with tens (dimes). ***The numbers can only borrow “next door.”***

In other words, a number can only borrow from the number directly on its left (“next door”). In this problem, there are no tens (dimes); therefore, the tens (dimes) have to first borrow from the hundreds (dollars).

- Have your child take a 100 (dollar) and trade it for ten 10’s (dimes). Record the exchange on the written problem.

$$\begin{array}{r} \overset{1}{\cancel{2}}10\ 1 \\ - \quad 5\ 9 \\ \hline \end{array} \quad \text{or} \quad \begin{array}{r} \overset{1}{\cancel{\$2}}.10\ 1 \\ - \quad \$\ .5\ 9 \\ \hline \end{array}$$

- Now the ones (pennies) can borrow from the tens (dimes). Have your child take a ten (dime) and trade it for ten ones (pennies). Again, record the exchange on the written problem.

$$\begin{array}{r} \overset{1}{\cancel{2}}\overset{9}{10}11 \\ - \quad 5\ 9 \\ \hline \end{array} \quad \text{or} \quad \begin{array}{r} \overset{1}{\cancel{\$2}}.\overset{9}{10}11 \\ - \quad \$\ .5\ 9 \\ \hline \end{array}$$

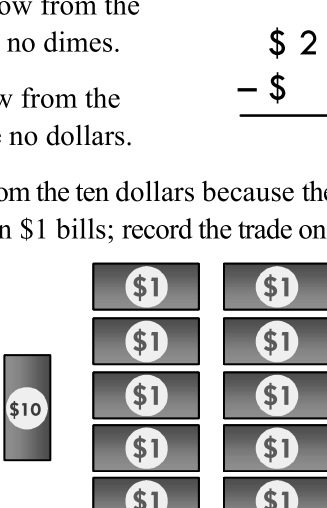
- Do the subtraction, both with the manipulatives and on the written problem.
- Practice this with other problems, transitioning to doing the work on paper without the manipulatives.

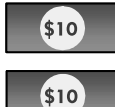
Borrowing from more than a single zero

This is basically the same concept as borrowing from one zero. Your child must understand that no matter how many zeros are in a row, each one can borrow only from its nearest neighbor to the left. Money provides a good way to teach this. Using two ten dollar bills, find out how much is left if you buy something for \$1.36.

- The pennies cannot borrow from the dimes, because there are no dimes.
- The dimes cannot borrow from the dollars because there are no dollars.
- The dollars *can* borrow from the ten dollars because there *are* two ten dollar bills. Trade one \$10 bill for ten \$1 bills; record the trade on the written problem.


$$\begin{array}{r} \overset{1}{\cancel{\$2}}0.00 \\ - \quad \$\ 1.36 \\ \hline \end{array}$$







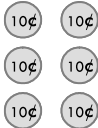
- Now the dimes can borrow from the dollars. Trade one dollar bill for ten dimes; record the trade on the written problem.

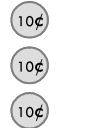
$$\begin{array}{r} 19 \\ \$ \cancel{2} \cancel{10}. 10 \ 0 \\ - \$ \quad 1. 3 \ 6 \\ \hline \end{array}$$














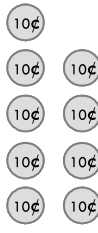
- The pennies can now borrow from the dimes. Trade one dime for the pennies; record the trade on the written problem. Then complete the subtraction.

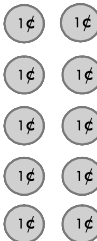
$$\begin{array}{r} 199 \\ \$ \cancel{2} \cancel{10}. \cancel{10} \ 10 \\ - \$ \quad 1. 3 \ 6 \\ \hline \end{array}$$











Practice with numbers that contain lots of zeros, and transition to subtracting without using manipulatives.

Two-step borrowing

Two step borrowing really isn't a different concept. If after you borrow from a number, that digit is smaller than the digit beneath it, then you must mark the borrowing in a slightly different way.

You will need to practice this with your child. Write this subtraction problem. (Use manipulatives if necessary, but if your child understands subtracting with regrouping, you can show this on paper.)

$$\begin{array}{r} 7 \ 0 \ 4 \ 0 \\ - 1 \ 2 \ 6 \ 2 \\ \hline \end{array}$$

The ones can borrow from the tens. However, the tens do not have enough to take away 6, so they must borrow from the hundreds. Since the hundreds have nothing, the hundreds must first borrow from the thousands.

$$\begin{array}{r} 3 \\ 7 \ 0 \ \cancel{4} \ 10 \\ - 1 \ 2 \ 6 \ 2 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 6 3 \\ \cancel{7} \ 10 \ \cancel{4} \ 10 \\ - 1 \ 2 \ 6 \ 2 \\ \hline 8 \end{array}$$

Here is the part that is a bit different. After crossing out the 10 and writing 9 above it, the borrowed 1 is placed next to the 3 and not next to the 4 (which has been crossed out). Usually, that is easy for children to see, but if you don't point it out, it will sometimes confuse them. The rest of the problem can now be done.

$$\begin{array}{r} 6 \ 9 \ 13 \\ \cancel{7} \ 10 \ \cancel{4} \ 10 \\ - 1 \ 2 \ 6 \ 2 \\ \hline 8 \end{array}$$

Practice with other problems that require two-step borrowing.