

Q My students really have difficulty getting the steps involved in long division. Any advice? —Tamara Henry, Fresno, CA

MARILYN ANSWERS: Let's face it. Long division is not easy to learn. For one thing, it is the first mathematical procedure kids learn that operates from right to left, rather than left to right. Secondly, long division is a lot more than division—after students divide, they have to multiply, then subtract, and finally bring down a number to start the process all over again. It can be confusing.

When they are first learning division, students often wonder why the

process also involves multiplying and subtracting, and what “bringing down” really means. Answering their questions can be tricky. It's no wonder that few people can explain why the long-division method works, even when they can do it correctly.

The key to students' mathematical learning is to demystify the process for them. Making real sense of long division, rather than simply following rules, is what leads to true understanding.

There is another way to do long

division problems that uses guesswork and critical thinking skills and that may help your students to make sense of the process of division. In the example below, 875 is divided by 6. What differs about this method is that the child looks at the whole number and estimates the answer, rather than dividing 6 into each digit: 8, 7, and 5.

This method even helps me make sense of long division more concretely, and therefore to communicate it to my students more clearly!

1 With this method of long division, we begin with estimation: About how many 6s can fit into 875? Then we choose a number that's friendly and easy to think about: At least 100 (because 6 times 100 is 600). So we write 100 on the right, and subtract 600 from 875, which leaves us with 275.

$$\begin{array}{r} 6 \overline{) 875} \quad 100 \\ \underline{600} \\ 275 \end{array}$$

2 Then we ask: How many more 6s can we take out of 275? We choose another friendly, easy-to-think-about number: 10. There are at least 10 sixes, so we'll write 10 in the right column. We subtract 60, which leaves 215. Now we need a new estimate: 10 6s is only 60, so how about 20?

$$\begin{array}{r} 6 \overline{) 875} \quad 100 \\ \underline{600} \\ 275 \quad 10 \\ \underline{60} \\ 215 \quad 20 \\ \underline{120} \end{array}$$

3 The process of estimation with friendly numbers continues until we are left with a remainder. Then we add up the right column to find the number of 6s in 875: The answer is 145 R5.

$$\begin{array}{r} 145R5 \\ 6 \overline{) 875} \quad 100 \\ \underline{600} \\ 275 \quad 10 \\ \underline{60} \\ 215 \quad 20 \\ \underline{120} \\ 95 \quad 10 \\ \underline{60} \\ 35 \quad 5 \\ \underline{30} \\ 5 \quad 145 \end{array}$$