U.S. traditional multiplication for decimals (standard) is familiar to most adults and many children. The algorithm is applied to decimals just as one would apply it to whole numbers, with the additional challenge of understanding where to place the decimal point in the product. To be successful, students must apply their number sense and their estimation skills.

Methods that improve students’ understanding of decimal multiplication include using models (base-10 blocks) to show repeated addition or groupings, using calculators to look for patterns in the decimals, and rounding factors to find a reasonable range for the product.

Build Understanding
If students need to review the whole-number version of this algorithm, refer them to page 49.

Review the process of estimating products of decimals. Write 2.8 \times 1.3 on the board and ask students to estimate the answer. Guide students to see that since 2.8 is almost 3, and 1.3 is between 1 and 2, the answer will be between 3 (3 \times 1) and 6 (3 \times 2). Then have students find the range for the problem 30.8 \times 4.7.

Using page 54, explain that with this method of decimal multiplication, students will multiply the factors as if they were whole numbers and then estimate to find a range for the answer, using their number sense to place the decimal point. Use questions like the following to guide students through the example:

- What do you need to do first? (Rewrite the problem using whole numbers. In the example, 4.8 \times 7.3 should be written as 48 \times 73.)
- Why must 4.8 \times 7.3 be greater than 28 (4 \times 7)? (4.8 is greater than 4, and 7.3 is greater than 7, so 4.8 \times 7.3 is greater than 4 \times 7.)
- Why must 4.8 \times 7.3 be less than 40 (5 \times 8)? (4.8 is less than 5, and 7.3 is less than 8, so 4.8 \times 7.3 is less than 5 \times 8.)
- Where do you place the decimal point in 3504 so that the product is between 28 and 40? (between the 5 and the 0: 35.04)
- What is a “shortcut” method to use when figuring out where to place the decimal point? (Count the total number of decimal places in both factors. It should be the same as the number of decimal places in the product.)

Error Alert Watch for students who incorrectly place the decimal point. Remind students that they can always simply count the total number of decimal places in both factors to determine how many decimal places should be in the product.

Check Understanding
Have a student make up a problem that he or she considers easy and write it on the board. Then have a volunteer go to the board and solve the problem. Repeat the process until you are reasonably certain that most of your students understand the algorithm. Then assign the “Check Your Understanding” exercises at the bottom of page 55. (See answers in margin.)
U.S. Traditional Multiplication for Decimals (Standard)

Use what you already know about multiplying whole numbers using U.S. traditional multiplication. Round the factors and multiply mentally to find a sensible range for the product. Use this sensible range to help you correctly place the decimal point in the product.

Example

Multiply as you would with whole numbers.

Estimate to place the decimal point in the answer.

• 4.8 is between 4 and 5.
• 7.3 is between 7 and 8.
• The product of 4.8 and 7.3 is between 28 (4×7) and 40 (5×8).
• 35.04 is between 28 and 40.

or

Count the total number of decimal places in both factors to place the decimal point in the answer. (The total number of decimal places in both factors will equal the number of decimal places in the product.)

4.8 * 7.3 = 35.04

Check Your Understanding

Solve the following problems.

1. 3.7 * 2.5
2. 8.1 * 6.4
3. 3.3 * 7.8
4. 6.1 * 8.9
5. 34 * 5.5
6. 70.3 * 21
7. 891 * 3.2
8. 6.56 * 2.05

Write your answers on a separate sheet of paper.

Student Practice 55