

Tips for Teachers

Chapter 4 Decimal Notation

Sections 4.1 and 4.5 Decimal Notation and Rounding

Some students might consider rounding with decimal notation to be more difficult than rounding whole numbers. Reassure them that the procedure is exactly the same in both cases.

Rounding Decimal Notation

To round to a given decimal place:

1. Locate the digit in that place.
2. Consider the next digit to the right.
3. If the digit to the right is 5 or higher, round up; if the digit to the right is 4 or lower, round down.

Be sure that students understand that when rounding a repeating decimal they should write the repeating portion out far enough to show the digit in the place being rounded to as well as the digit in the next place to the right. For example, to round $7.\overline{19}$ to the nearest thousandth, write $7.1919\overline{19}$ and then follow the procedure above.




A Caution

Some students will want to round over successively from the decimal place farthest to the right regardless of the place being rounded to. For example, when rounding 14.6247 to the nearest hundredth, some students will round over from the ten-thousandths place as follows:

$$14.6247 \rightarrow 14.625 \rightarrow 14.63$$

Caution students to round over *only* from the place immediately to the right of the place being rounded to. To round 14.6247 to the nearest hundredth, for instance, explain that we consider only the digit to the right of the digit in the hundredths place. Since that digit, 4, is 4 or lower we round down, obtaining 14.62.

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Section 4.4 Division with Decimal Notation

Division with decimal notation can be a daunting and confusing operation for some students. Many know that “the decimal point needs to be moved,” but they are often uncertain whether this means the decimal point in the divisor, the decimal point in the dividend, or both and how many places to move the decimal point.

Beginning the Discussion

Begin your discussion of division with decimal notation by dividing decimal quantities by whole number divisors. Here the decimal point is dealt with in a straightforward manner. It is simply

placed above the decimal point in the dividend. Then we divide as though we were dividing whole numbers in arithmetic.




Placing the Decimal Point in the Quotient

Next, emphasize that in dividing using decimal notation when the divisor is not a whole number, the first step is to change to a whole-number *divisor*. Thus, we move the decimal point according to the number of decimal places in the *divisor* and we move it the same number of places in both the dividend and the divisor.

For example, consider $0.12 \overline{)23.476}$. There are two decimal places in 0.12, so, by moving the decimal point two places to the right in both the divisor and the dividend, we obtain an equivalent division $12 \overline{)2347.6}$. This is the division that results when we multiply $23.476/0.12$ by $100/100$. That is, moving the decimal point two places to the right in both the divisor and the dividend is the same as multiplying the fraction that represents the original division by 1 in the form $100/100$.

The key to mastering division with decimal notation is to understand that we want to do an equivalent division with a whole number *divisor*, so we move the decimal point according to the number of decimal places in the *divisor*.

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