

Key Concepts

Lesson
3-5

Adding and Subtracting Decimals

Objective Teach students to add and subtract decimals.

Note to the Teacher *The only idea needed to add or subtract decimals, beyond the standard algorithms for addition and subtraction of whole numbers, is the alignment of the numbers so the decimal points line up one above the other. Since this skill is easily conveyed to students, take this opportunity to reinforce their understanding of the decimal place-value system.*

The Algorithm

Begin by introducing the following algorithm, since it allows students to solve problems right away.

Addition and Subtraction Algorithm for Decimals	<ol style="list-style-type: none">1. Write both decimals, one above the other, with the decimal point of one directly over the decimal point of the other.2. Add or subtract the numbers as if they were whole numbers, ignoring the decimal point.3. Place the decimal point in the answer directly below the decimal points in the numbers being added or subtracted.
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Example 1 Add 2.12 and 3.59.

Solution Write the two numbers one above the other, with the decimal points aligned.

$$\begin{array}{r} 2.12 \\ + 3.59 \\ \hline \end{array}$$

Add the digits, ignoring the decimal points at this step.

$$\begin{array}{r} \overset{1}{2}.12 \\ + 3.59 \\ \hline 5\ 71 \end{array}$$

Insert a decimal point in the answer, directly below the other decimal points.

$$\begin{array}{r} 2.12 \\ + 3.59 \\ \hline 5.71 \end{array}$$

So, the sum of 2.12 and 3.59 is 5.71.

Example 2 Subtract 1.01 from 3.17.

Solution 3.17 *Line up the decimal points.*
 - 1.01 *Subtract as with whole numbers.*
 2.16 *Place the decimal point in the answer.*

In some addition and subtraction problems, there will be more digits to the right of the decimal point in one number than in the other number. Emphasize the importance of aligning the decimal points in problems where this is true. It may be helpful to some students if they insert one or more zeros to the right of the last digit of the number with fewer decimal places so that both numbers have the same number of digits to the right of the decimal point. The example below shows this procedure.

Example 3 Add 2.1 and 5.432.

Solution Be sure to align the decimal points even though the numbers do not have the same number of digits.

2.100 *Annex zeros; 2.1 = 2.100.*
 + 5.432

Now use the algorithm to find the sum.

2.100
 + 5.432
 7.532

So, the sum of 2.1 and 5.432 is 7.532.

Estimation

Just as when adding and subtracting whole numbers, estimation should be used to check the reasonableness of the answer to a decimal sum or difference. For example, consider the sum of 2.9 and 4.3. Since 2.9 is almost 3 and 4.3 is about 4, their sum should be approximately $3 + 4$ or 7. Using the algorithm, $2.9 + 4.3 = 7.2$. The estimate of 7 indicates that 7.2 is a reasonable result for the sum.

Note to the Teacher *It is important that students be provided with ample opportunities to use the addition and subtraction algorithm for decimals, both for skills practice and for use in applied contexts.*

