Common Core State Standard:
6.NS.3

Add and Subtract Decimals

Getting the Idea

Adding and subtracting decimals is like adding and subtracting integers. Write the problem vertically, lining up the decimal points. Add or subtract from right to left. Regroup if necessary.

Example 1

Sheila and Leslie hiked 8.76 kilometers in the morning and 4.29 kilometers in the afternoon. How many kilometers did they hike in all?

Strategy **Align the decimal points. Add from right to left. Regroup if necessary.**

Step 1 Align the decimal points.

Place the decimal point in the sum.

$$\begin{array}{r} 8.76 \\ +\ 4.29 \\ \hline . \end{array}$$

Step 2 Add the hundredths.

$6 + 9 = 15$

Write the 5.

Regroup 10 hundredths as 1 tenth.

$$\begin{array}{r} {\scriptstyle 1} \\ 8.76 \\ +\ 4.29 \\ \hline .\ 5 \end{array}$$

Step 3 Add the tenths.

$1 + 7 + 2 = 10$

Write the 0.

Regroup 10 tenths as 1 one.

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 8.76 \\ +\ 4.29 \\ \hline .05 \end{array}$$

Step 4 Add the ones.

$1 + 8 + 4 = 13$

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 8.76 \\ +\ 4.29 \\ \hline 13.05 \end{array}$$

Solution **Sheila and Leslie hiked a total of 13.05 kilometers.**

Writing one or more zeros to the right of the last digit in a decimal does not change the value of the decimal. For example:

$1.2 = 1.20 = 1.200$

You can use this to help you add and subtract decimals with different numbers of places.

Example 2

A plumber has two metal pipes. The first pipe is 2.35 meters long. The second pipe is 1.725 meters long. How much longer is the first pipe than the second pipe?

Strategy **Subtract from right to left. Regroup if necessary.**

Step 1 Align the decimal points. Write a 0 in the thousandths place for 2.35.

Place the decimal point in the difference.

$$\begin{array}{r} 2.350 \\ -\ 1.725 \\ \hline . \end{array}$$

Step 2 Regroup 1 hundredth as 10 thousandths. Subtract the thousandths.

$$\begin{array}{r} {}^{4}\!\not{5}\,{}^{10}\!\not{0} \\ 2.3\not{5}\not{0} \\ -\ 1.7\,2\,5 \\ \hline .\quad\ 5 \end{array}$$

Step 3 Subtract the hundredths.

$$\begin{array}{r} {}^{4}\!\not{5}\,{}^{10}\!\not{0} \\ 2.3\not{5}\not{0} \\ -\ 1.7\,2\,5 \\ \hline .\ 2\,5 \end{array}$$

Step 4 Regroup 1 one as 10 tenths. Subtract the tenths.

$$\begin{array}{r} {}^{1}\!\not{2}\,{}^{13}\!\not{.}\not{3}\,{}^{4}\!\not{5}\,{}^{10}\!\not{0} \\ -\ 1.7\,2\,5 \\ \hline .6\,2\,5 \end{array}$$

Step 5 Subtract the ones.

$$\begin{array}{r} {}^{1}\!\not{2}\,{}^{13}\!\not{.}\not{3}\,{}^{4}\!\not{5}\,{}^{10}\!\not{0} \\ -\ 1.7\,2\,5 \\ \hline 0.6\,2\,5 \end{array}$$

Solution **The first pipe is 0.625 meter longer than the second pipe.**

Example 3

Liana and Terrence each bought orange juice for a school brunch. Liana bought a container with 1.89 liters of orange juice. Terrence bought 3 small containers, each of which held 0.473 liter of orange juice. Who bought more orange juice? How much more orange juice, in liters, did that student buy?

Strategy **Add. Compare. Then subtract.**

Step 1 Add to find the total number of liters Terrence bought.

$$\begin{array}{r} {\scriptstyle 1\ 2\ \ } \\ 0.473 \\ 0.473 \\ +\ 0.473 \\ \hline 1.419 \end{array}$$

Step 2 Compare Liana's total to Terrence's total.

Liana bought 1.89 liters. Terrence bought 1.419 liters.

$1.89 > 1.419$, so Liana bought more orange juice than Terrence.

Step 3 Subtract Terrence's total from Liana's total.

First write a 0 in the thousandths place for 1.89.

$$\begin{array}{r} {\scriptstyle 8\,10} \\ 1.8\not{9}\not{0} \\ -\ 1.419 \\ \hline 0.471 \end{array}$$

Solution **Liana bought 0.471 liter of orange juice more than Terrence did.**

Coached Example

Melanie had a budget of $225 for costumes for the school play. She spent $86.56 on jackets and $45.38 on hats. How much money does Melanie have left in the budget?

First add to find how much money Melanie has spent so far.

The jackets cost $_____.

The hats cost $_____.

Add. Show your work in the space below.

Then subtract the total amount spent from $225.

Remember that 225 = 225.00

Subtract. Show your work in the space below.

Melanie has $_____ left in the budget.