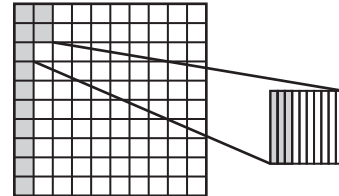# Thousandths

Thousandths are smaller parts than hundredths. If one hundredth is divided into 10 equal parts, each part is one **thousandth**.

**Write the decimal shown by the shaded parts of the model.**

One column of the decimal model is shaded.
It represents one tenth, or __0.1__.

Two small squares of the decimal model are shaded.
They represent two hundredths, or __0.02__.

A one-hundredth square is divided into 10 equal parts, or thousandths. Three columns of the thousandth square are shaded. They represent __0.003__.

So, 0.123 of the decimal model is shaded.

The relationship of a digit in different place-value positions is the same for decimals as for whole numbers.

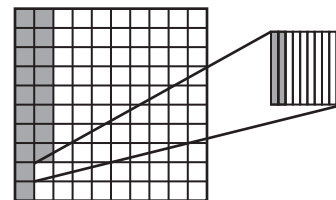**Write the decimals in a place-value chart.**

| Ones | Tenths | Hundredths | Thousandths |
|------|--------|------------|-------------|
| 0 | 8 | | |
| 0 | 0 | 8 | |
| 0 | 0 | 0 | 8 |

0.08 is $\frac{1}{10}$ of __0.8__.

0.08 is 10 times as much as __0.008__.

**1.** Write the decimal shown by the shaded parts of the model.

_____

**Use place-value patterns to complete the table.**

| Decimal | 10 times as much as | $\frac{1}{10}$ of |
|---------|---------------------|-------------------|
| **2.** 0.1 | | |
| **3.** 0.03 | | |
| **4.** 0.5 | | |

| Decimal | 10 times as much as | $\frac{1}{10}$ of |
|---------|---------------------|-------------------|
| **5.** 0.02 | | |
| **6.** 0.4 | | |
| **7.** 0.06 | | |

# Place Value of Decimals

You can use a place-value chart to find the value of each digit in a decimal.
Write whole numbers to the left of the decimal point.
Write decimals to the right of the decimal point.

| Ones | Tenths | Hundredths | Thousandths |
|---|---|---|---|
| 3 | 8 | 4 | 7 |
| $3 \times 1$ | $8 \times \frac{1}{10}$ | $4 \times \frac{1}{100}$ | $7 \times \frac{1}{1,000}$ |

| | | | | |
|---|---|---|---|---|
| 3.0 | 0.8 | 0.04 | 0.007 | **Value** |

The place value of the digit 8 in 3.847 is tenths.

The value of 8 in 3.847 is $8 \times \frac{1}{10}$, or 0.8.

You can write a decimal in different forms.

**Standard Form:** 3.847

**Expanded Form:** __3__ $\times 1 +$ __8__ $\times \frac{1}{10} +$ __4__ $\times (\frac{1}{100}) +$ __7__ $\times (\frac{1}{1,000})$

When you write the decimal in word form, write "and" for the decimal point.

**Word Form:** three __and__ eight hundred forty-seven __thousandths__

**1.** Complete the place-value chart to find the value of each digit.

| Ones | Tenths | Hundredths | Thousandths |
|---|---|---|---|
| 2 | 6 | 9 | 5 |
| $2 \times 1$ | | $9 \times \frac{1}{100}$ | |
| | 0.6 | | |

**Value**

**Write the value of the underlined digit.**

**2.** 0.7<u>9</u>2

**3.** 4.<u>6</u>91

**4.** 3.80<u>5</u>

_____  _____  _____

Name _____

# Compare and Order Decimals

---

You can use a place-value chart to compare decimals.

**Compare. Write <, >, or =.**

4.375 ◯ 4.382

Write both numbers in a place-value chart. Then compare the digits, starting with the highest place value. Stop when the digits are different and compare.

| Ones | Tenths | Hundredths | Thousandths |
|------|--------|------------|-------------|
| 4 | 3 | 7 | 5 |
| 4 | 3 | 8 | 2 |

↑ The ones digits are the same. ↑ The tenths digits are the same. ↑ The hundredths digits are different.

The digits are different in the hundredths place.

Since 7 hundredths < 8 hundredths, 4.375 ◯< 4.382.

---

**1.** Use the place-value chart to compare the two numbers. What is the greatest place-value position where the digits differ?

| Ones | Tenths | Hundredths | Thousandths |
|------|--------|------------|-------------|
| 2 | 8 | 6 | 5 |
| 2 | 8 | 6 | 1 |

_____

**Compare. Write <, >, or =.**

**2.** 5.37 ◯ 5.370

**3.** 9.425 ◯ 9.417

**4.** 7.684 ◯ 7.689

**Name the greatest place-value position where the digits differ. Name the greater number.**

**5.** 8.675; 8.654

_____

_____

**6.** 3.086; 3.194

_____

_____

**7.** 6.243; 6.247

_____

_____

**Order from least to greatest.**

**8.** 5.04; 5.4; 5.406; 5.064

_____

**9.** 2.614; 2.146; 2.46; 2.164

_____

# Round Decimals

Rounding decimals is similar to rounding whole numbers.

**Round 4.682 to the nearest tenth.**

**Step 1** Write 4.682 in a place-value chart.

| Ones | • | Tenths | Hundredths | Thousandths |
|:----:|:-:|:------:|:----------:|:-----------:|
| 4 | • | (6) | 8 | 2 |

**Step 2** Find the digit in the place to which you want to round. Circle that digit.

The digit ___6___ is in the tenths place, so circle it.

**Step 3** Underline the digit to the right of the circled digit.

The digit ___8___ is to the right of the circled digit, so underline it.

**Step 4** If the underlined digit is less than 5, the circled digit stays the same. If the underlined digit is 5 or greater, round up the circled digit.

___8___ > 5, so round 6 up to 7.

**Step 5** After you round the circled digit, drop the digits to the right of the circled digit.

So, 4.682 rounded to the nearest tenth is ___4.7___.

**Write the place value of the underlined digit. Round each number to the place of the underlined digit.**

**1.** 0.3<u>9</u>2

**2.** 5.<u>7</u>14

**3.** 1<u>6</u>.908

**Name the place value to which each number was rounded.**
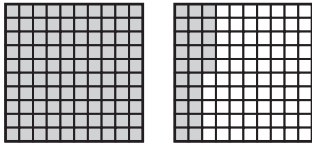
**4.** 0.825 to 0.83

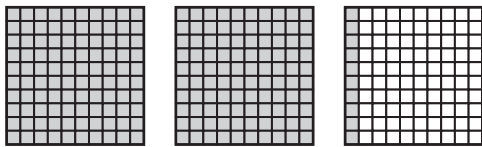**5.** 3.815 to 4

**6.** 1.546 to 1.5

# Decimal Addition

You can use decimal models to help you add decimals.

**Add.** 1.25 + 0.85

**Step 1** Shade squares to represent 1.25.



**Step 2** Shade additional squares to represent adding 0.85.



**Remember:**
Since there are only 75 squares left in the second model, you need to add another whole model for the remaining 10 squares.

**Step 3** Count the total number of shaded squares. There are 2 whole squares and 10 one-hundredths squares shaded. So, 2.10 wholes in all are shaded.

So, 1.25 + 0.85 = __2.10__.

**Add. Use decimal models. Draw a picture to show your work.**

**1.** 2.1 + 0.59

_____

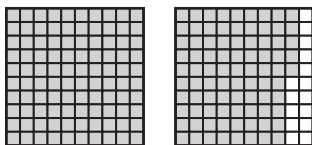**2.** 1.4 + 0.22

_____

**3.** 1.27 + 1.15
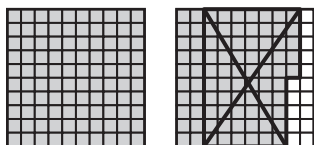
_____

**4.** 0.81 + 0.43

_____

# Decimal Subtraction

You can use decimal models to help you subtract decimals.

**Subtract.** 1.85 − 0.65

**Step 1** Shade squares to represent 1.85.

**Step 2** Circle and cross out 65 of the shaded squares to represent subtracting 0.65.

**Remember:**
By circling and crossing out shaded squares, you can see how many squares are taken away, or subtracted.

**Step 3** Count the shaded squares that are not crossed out. Altogether, 1 whole square and 20 one-hundredths squares, or 1.20 wholes, are NOT crossed out.

So, 1.85 − 0.65 = __**1.20**__.

**Subtract. Use decimal models. Draw a picture to show your work.**

**1.** 1.4 − 0.61

**2.** 1.6 − 1.08

**3.** 0.84 − 0.17

**4.** 1.39 − 1.14

# Estimate Decimal Sums
# and Differences

You can use rounding to help you estimate sums and differences.

**Use rounding to estimate 1.24 + 0.82 + 3.4.**

Round to the nearest whole number. Then add.

$$
\begin{array}{rcl}
1.24 & \longrightarrow & 1 \\
0.82 & \longrightarrow & 1 \\
+\,3.4 & \longrightarrow & +\,3 \\
\hline
 & & 5
\end{array}
$$

So, the sum is about __5__.

> **Remember:**
> If the digit to the right of the place you are rounding to is:
> • less than 5, the digit in the rounding place stays the same.
> • greater than or equal to 5, the digit in the rounding place increases by 1.

**Use benchmarks to estimate 8.78 − 0.30.**

$$
\begin{array}{rcl}
8.78 & \longrightarrow & 8.75 \\
-\,0.30 & \longrightarrow & -\,0.25 \\
\hline
 & & 8.5
\end{array}
$$

**Think:** 0.78 is between __0.75__ and __1__.
It is closer to __0.75__.

**Think:** 0.30 is between __0.25__ and __0.50__.
It is closer to __0.25__.

So, the difference is about __8.5__.

**Use rounding to estimate.**

| | | | | |
|---|---|---|---|---|
| **1.** $\begin{array}{r}51.23\\-28.4\\\hline\end{array}$ | **2.** $\begin{array}{r}\$29.38\\+\$42.75\\\hline\end{array}$ | **3.** $\begin{array}{r}7.6\\-2.15\\\hline\end{array}$ | **4.** $\begin{array}{r}0.74\\+0.20\\\hline\end{array}$ | **5.** $\begin{array}{r}2.08\\0.56\\+0.41\\\hline\end{array}$ |

**Use benchmarks to estimate.**

| | | | | |
|---|---|---|---|---|
| **6.** $\begin{array}{r}6.17\\-3.5\\\hline\end{array}$ | **7.** $\begin{array}{r}1.73\\1.4\\+3.17\\\hline\end{array}$ | **8.** $\begin{array}{r}3.28\\-0.86\\\hline\end{array}$ | **9.** $\begin{array}{r}15.27\\+41.8\\\hline\end{array}$ | **10.** $\begin{array}{r}\$23.07\\-\$\ 7.83\\\hline\end{array}$ |

**11.** $0.427 + 0.711$

_____

**12.** $61.05 - 18.63$

_____

**13.** $40.51 + 30.39$

_____

# Add Decimals

**Add.** 4.37 + 9.8

**Step 1** Estimate the sum.

$$4.37 + 9.8$$
$$\downarrow \qquad \downarrow$$
Estimate:  4  +  10  =  14

**Step 2** Line up the place values for each number in a place-value chart.
Then add.

|   | Ones | Tenths | Hundredths |
|---|------|--------|------------|
|   | 4 ● | 3 | 7 |
| + | 9 ● | 8 |  |
|   | **14** ● | **1** | **7** | ←sum

**Step 3** Use your estimate to determine if your answer is reasonable.

**Think:** 14.17 is close to the estimate, 14. The answer is reasonable.

So, 4.37 + 9.8 = **14.17**.

**Estimate. Then find the sum.**

**1.** Estimate: _____

$$\begin{array}{r} 1.20 \\ + 0.34 \\ \hline \end{array}$$

**2.** Estimate: _____

$$\begin{array}{r} 1.52 \\ + 1.21 \\ \hline \end{array}$$

**3.** Estimate: _____

$$\begin{array}{r} 12.25 \\ + 11.25 \\ \hline \end{array}$$

**4.** Estimate: _____

$$\begin{array}{r} 10.75 \\ + 1.11 \\ \hline \end{array}$$

**5.** Estimate: _____

$$\begin{array}{r} 22.65 \\ + 18.01 \\ \hline \end{array}$$

**6.** Estimate: _____

$$\begin{array}{r} 34.41 \\ + 15.37 \\ \hline \end{array}$$

Name _____

# Subtract Decimals

---

**Subtract.** 12.56 − 4.33

**Step 1** Estimate the difference.

$$12.56 - 4.33$$
$$\downarrow \qquad \downarrow$$
Estimate:   13  −  4 = 9

**Step 2** Line up the place values for each number in a place-value chart. Then subtract.

| Ones | | Tenths | Hundredths |
|------|---|--------|------------|
| 12 | ● | 5 | 6 |
| − 4 | ● | 3 | 3 |
| 8 | ● | 2 | 3 |

←difference

**Step 3** Use your estimate to determine if your answer is reasonable.

**Think:** 8.23 is close to the estimate, 9. The answer is reasonable.

So, 12.56 − 4.33 = **8.23** .

---

**Estimate. Then find the difference.**

**1.** Estimate: _____

$$\begin{array}{r} 1.97 \\ -\ 0.79 \\ \hline \end{array}$$

**2.** Estimate: _____

$$\begin{array}{r} 4.42 \\ -\ 1.26 \\ \hline \end{array}$$

**3.** Estimate: _____

$$\begin{array}{r} 10.25 \\ -\ 8.25 \\ \hline \end{array}$$

**Find the difference. Check your answer.**

**4.**
$$\begin{array}{r} 5.75 \\ -\ 1.11 \\ \hline \end{array}$$

**5.**
$$\begin{array}{r} 25.21 \\ -\ 19.05 \\ \hline \end{array}$$

**6.**
$$\begin{array}{r} 42.14 \\ -\ 25.07 \\ \hline \end{array}$$
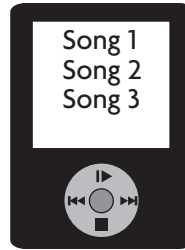
# Algebra • Patterns with Decimals

**Marla wants to download some songs from the Internet. The first song costs $1.50, and each additional song costs $1.20. How much will 2, 3, and 4 songs cost?**
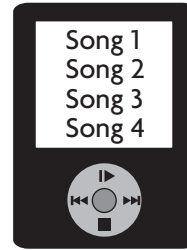
| Song 1 | Song 1<br>Song 2 | Song 1<br>Song 2<br>Song 3 | Song 1<br>Song 2<br>Song 3<br>Song 4 |
|---|---|---|---|
| 1 song<br>$1.50 | 2 songs<br>? | 3 songs<br>? | 4 songs<br>? |

**Step 1** Identify the first term in the sequence.
   **Think:** The cost of 1 song is $1.50. The first term is $1.50.

**Step 2** Identify whether the sequence is increasing or decreasing from one term to the next.
   **Think:** Marla will pay $1.20 for each additional song.
   The sequence is increasing.

**Step 3** Write a rule that describes the sequence. Start with $1.50 and add $1.20.

**Step 4** Use your rule to find the unknown terms in the sequence.

| Number of Songs | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Cost | $1.50 | $1.50 + 1.20 = $2.70 | 2.70 + 1.20 = $3.90 | 3.90 + 1.20 = $5.10 |

So, 2 songs cost $2.70, 3 songs cost $3.90, and 4 songs cost $5.10.

**Write a rule for the sequence.**

**1.** 0.4, 0.7, 1.0, 1.3, …

   **Rule:** _____

**2.** 5.25, 5.00, 4.75, 4.50, …

   **Rule:** _____

**Write a rule for the sequence, then find the unknown term.**

**3.** 26.1, 23.8, 21.5, _____, 16.9

_____

**4.** 4.62, 5.03, _____, 5.85, 6.26

_____

# Problem Solving •
# Add and Subtract Money

At the end of April, Mrs. Lei had a balance of $476.05. Since then
she has written checks for $263.18 and $37.56, and made a deposit
of $368.00. Her checkbook balance currently shows $498.09.
Find Mrs. Lei's correct balance.

| Read the Problem | Solve the Problem |
|---|---|
| **What do I need to find?**<br><br>I need to find **Mrs. Lei's**<br>**correct checkbook balance** . | **Solve the Problem** |

### Read the Problem

**What do I need to find?**

I need to find **Mrs. Lei's correct checkbook balance** .

**What information do I need to use?**

I need to use the **April balance, and the check and deposit amounts** .

**How will I use the information?**

I need to make a table and use the
information to **subtract the checks and add the deposit to find the correct balance** .

### Solve the Problem

**Balancing Mrs. Lei's Checkbook**

| Balancing Mrs. Lei's Checkbook | | | |
|---|---|---|---|
| April balance | | | $476.05 |
| Deposit | | $368.00 | +$368.00 |
| | | | $844.05 |
| Check | $263.18 | | −$263.18 |
| | | | $580.87 |
| Check | $37.56 | | −$37.56 |
| | | | $543.31 |

Mrs. Lei's correct balance is

**$543.31**

1. At the end of June, Mr. Kent had a
balance of $375.98. Since then he has
written a check for $38.56 and made a
deposit of $408.00. His checkbook shows
a balance of $645.42. Find Mr. Kent's
correct balance.

2. Jordan buys a notebook for himself and
each of 4 friends. Each notebook costs
$1.85. Make a table to find the cost of
5 notebooks.

Name _____

# Choose a Method

There is more than one way to find the sums and differences of whole numbers and decimals. You can use properties, mental math, place value, a calculator, or paper and pencil.

**Choose a method. Find the sum or difference.**

- Use mental math for problems with fewer digits or rounded numbers.

$$\begin{array}{r} 2.86 \\ -\ 1.2 \\ \hline 1.66 \end{array}$$

- Use place value for larger numbers.

$$\begin{array}{r} \overset{1\ \ 1}{\$15.79} \\ +\ \$32.81 \\ \hline \$48.60 \end{array}$$

- Use a calculator for difficult numbers or very large numbers.

$$\boxed{3}\ \boxed{8}\ \boxed{.}\ \boxed{4}\ \boxed{4}\ \boxed{-}\ \boxed{2}\ \boxed{5}\ \boxed{.}\ \boxed{8}\ \boxed{6}\ \boxed{=}\ \boxed{12.58}$$

**Find the sum or difference.**

**1.** $\begin{array}{r} 73.9 \\ +\ 4.37 \\ \hline \end{array}$

**2.** $\begin{array}{r} 127.35 \\ +\ 928.52 \\ \hline \end{array}$

**3.** $\begin{array}{r} 10 \\ +\ 2.25 \\ \hline \end{array}$

**4.** $\begin{array}{r} 0.36 \\ +\ 1.55 \\ \hline \end{array}$

**5.** $\begin{array}{r} 71.4 \\ +\ 11.5 \\ \hline \end{array}$

**6.** $\begin{array}{r} 90.4 \\ +\ 88.76 \\ \hline \end{array}$

**7.** $\begin{array}{r} 3.3 \\ +\ 5.6 \\ \hline \end{array}$

**8.** $\begin{array}{r} 14.21 \\ 1.79 \\ +\ 15.88 \\ \hline \end{array}$

**9.** $68.20 - 42.10$

**10.** $2.25 - 1.15$

**11.** $875.33 - 467.79$

**12.** $97.26 - 54.90$

_____ _____ _____ _____