

Getting Ready

Rounding

Rounding is a kind of estimating and is important too for everyday life. We can estimate money, lengths of time, distances and many other physical quantities. To round we need to know to what place.

Place Value Chart: Decimals

| hundred thousands | ten thousands | thousands | hundreds | tens | ones | . | tenths | hundredths | thousandths |
|-------------------|---------------|-----------|----------|------|------|---|--------|------------|-------------|
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To round off whole numbers:

1. Find the place value you want (the "rounding digit") and look to the digit just to the right of it.
2. If that digit is less than 5, do not change the "rounding digit" but change all digits to the right of the "rounding digit" to zero.
3. If that digit is greater than or equal to 5, add one to the rounding digit and change all digits to the right of the rounding digit to zero.

To round off decimals:

1. Find the place value you want (the "rounding digit") and look at the digit just to the right of it.
2. If that digit is less than 5, do not change the rounding digit but drop all digits to the right of it.
3. If that digit is greater than or equal to five, add one to the rounding digit and drop all digits to the right of it.

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Less than 5 More than 5

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | | | | | 1 | | | | |

Rounding down ← → Rounding up

Round to the nearest whole number.

5.636

Since the digit to the right is 5 or greater, round up to 6.

5.636 rounded to the nearest whole number is 6.

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Round to the nearest tenth.

$\begin{array}{c} \text{---} \downarrow \\ 5.\underline{6}36 \\ \uparrow \text{---} \end{array}$

Since the next digit to the right is less than 5, round down to 5.6.

5.636 rounded to the nearest tenth is 5.6.

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Round to the nearest hundredth.

$\begin{array}{c} \text{---} \downarrow \\ 5.\underline{63}6 \\ \uparrow \text{---} \end{array}$

Since the next digit to the right is 5 or greater, round up to 5.64.

5.636 rounded to the nearest hundredth is 5.64.

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What is 8.525 rounded to the nearest whole number? _____

What is 8.525 rounded to the nearest tenth? _____

What is 8.525 rounded to the nearest hundredth? _____

What is 3.341 rounded to the nearest whole number? _____

What is 3.341 rounded to the nearest tenth? _____

What is 3.341 rounded to the nearest hundredth? _____

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What is 8.525 rounded to the nearest whole number? 9

What is 8.525 rounded to the nearest tenth? 8.6

What is 8.525 rounded to the nearest hundredth? 8.53

What is 3.341 rounded to the nearest whole number? 3

What is 3.341 rounded to the nearest tenth? 3.3

What is 3.341 rounded to the nearest hundredth? 3.34

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Circle the correct answer.

5.385 rounded to the nearest tenth is 5.3 5.4 5.5

4.62 rounded to the nearest whole number is 4.7 4 5

6.652 rounded to the nearest tenth is 6.5 6.6 6.7

4.106 rounded to the nearest hundredth is 4.10 4.11 4.12

Circle the correct answer.

5.385 rounded to the nearest tenth is 5.3 5.4 5.5

4.62 rounded to the nearest whole number is 4.7 4 5

6.652 rounded to the nearest tenth is 6.5 6.6 6.7

4.106 rounded to the nearest hundredth is 4.10 4.11 4.12

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Rounding Decimals

Round the nearest whole number.

| | | |
|--------------|--------------|--------------|
| 1.27 _____ | 4.109 _____ | 19.51 _____ |
| 5.9 _____ | 22.83 _____ | 11.362 _____ |
| 3.156 _____ | 8.011 _____ | 10.94 _____ |
| 31.7 _____ | 0.506 _____ | 2.251 _____ |
| 19.82 _____ | 21.709 _____ | 5.5 _____ |
| 15.702 _____ | 6.341 _____ | 53.3 _____ |

Rounding Decimals

Round the nearest whole number.

| | | |
|------------------|------------------|------------------|
| 1.27 <u>1</u> | 4.109 <u>4</u> | 19.51 <u>20</u> |
| 5.9 <u>6</u> | 22.83 <u>23</u> | 11.362 <u>11</u> |
| 3.156 <u>3</u> | 8.011 <u>8</u> | 10.94 <u>11</u> |
| 31.7 <u>32</u> | 0.506 <u>1</u> | 2.251 <u>2</u> |
| 19.82 <u>20</u> | 21.709 <u>22</u> | 5.5 <u>6</u> |
| 15.702 <u>16</u> | 6.341 <u>6</u> | 53.3 <u>53</u> |

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Round the nearest tenth.

| | | |
|--------------|--------------|--------------|
| 1.27 _____ | 4.408 _____ | 11.509 _____ |
| 9.538 _____ | 12.823 _____ | 0.222 _____ |
| 6.141 _____ | 8.011 _____ | 7.094 _____ |
| 28.127 _____ | 4.506 _____ | 2.609 _____ |
| 19.82 _____ | 9.634 _____ | 35.515 _____ |
| 15.702 _____ | 16.230 _____ | 17.091 _____ |

Round the nearest tenth.

| | | |
|--------------------|--------------------|--------------------|
| 1.27 <u>1.3</u> | 4.408 <u>4.4</u> | 11.509 <u>11.5</u> |
| 9.538 <u>9.5</u> | 12.823 <u>12.8</u> | 0.222 <u>.2</u> |
| 6.141 <u>6.1</u> | 8.011 <u>8.0</u> | 7.094 <u>7.1</u> |
| 28.127 <u>28.1</u> | 4.506 <u>4.5</u> | 2.609 <u>2.6</u> |
| 19.82 <u>19.8</u> | 9.634 <u>9.6</u> | 35.515 <u>35.5</u> |
| 15.702 <u>15.7</u> | 16.230 <u>16.2</u> | 17.091 <u>17.1</u> |

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Round the nearest hundredth.

| | | |
|--------------|--------------|---------------|
| 7.1091 _____ | 3.655 _____ | 2.073 _____ |
| 6.941 _____ | 12.107 _____ | 2.3845 _____ |
| 15.039 _____ | 9.127 _____ | 11.2773 _____ |
| 5.285 _____ | 9.789 _____ | 0.007 _____ |
| 3.362 _____ | 3.215 _____ | 7.005 _____ |
| 16.336 _____ | 4.218 _____ | 33.333 _____ |

Round the nearest hundredth.

| | | |
|---------------------|---------------------|----------------------|
| 7.1091 <u>7.11</u> | 3.655 <u>3.66</u> | 2.073 <u>2.07</u> |
| 6.941 <u>6.94</u> | 12.107 <u>12.11</u> | 2.3845 <u>2.38</u> |
| 15.039 <u>15.04</u> | 9.127 <u>9.13</u> | 11.2773 <u>11.28</u> |
| 5.285 <u>5.29</u> | 9.789 <u>9.79</u> | 0.007 <u>.01</u> |
| 3.362 <u>3.36</u> | 3.215 <u>3.22</u> | 7.005 <u>7.01</u> |
| 16.336 <u>16.34</u> | 4.218 <u>4.22</u> | 33.333 <u>33.33</u> |

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Sometimes, calculations with money give us answers that don't make sense.

For example, $\$26 \div 16 = \1.625 **What does this mean?**

When we write money this way, we only need TWO DIGITS to the RIGHT of the decimal place.

These are the cents.
So, \$1.625 should be **rounded UP** to \$1.63 since the next digit is a 5!

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Practice Problems

Circle the closest CENT:

1) Is \$0.263 closer to \$0.26 or \$0.27?

2) Is \$8.916 closer to \$8.91 or \$8.92?

3) Is \$408.065 closer to 408.06 or \$408.07?

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1. Round to the nearest DOLLAR:

a. \$36.59 - _____ b. \$702.38 - _____

2. Round to the nearest TEN DOLLARS:

a. \$461.64 - _____ b. \$32,675.73 - _____

3. Round to the nearest HUNDRED DOLLARS:

a. \$3,591 - _____ b. \$62,815.00 - _____

4. Round to the nearest CENT:

a. \$3.621 - _____ c. \$92.738 - _____

b. \$245.725 - _____ d. \$26.039 - _____

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5. Answer the following problems:

a. One piece of gum is worth \$0.225. Round this to the nearest CENT _____

b. One piece of paper is worth \$0.0823. Round this to the nearest CENT _____

c. The average cost of a T.V. in a store is \$565.32. Round this to the nearest HUNDRED DOLLARS _____

d. When you buy a CD at the store, the total cost is \$27.15. Round this to the nearest TEN DOLLARS _____

e. A new car costs \$18,995.39. Round this to the nearest DOLLAR. _____

f. Andy earns \$317,425 playing professional hockey. Round this to the nearest THOUSAND DOLLARS _____

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Comparing Numbers

It is often important to compare numbers to determine which is larger or smaller.

We use special symbols to show if a number is greater > or less <

$12 < 37$
12 is less than 37

$74 > 58$
74 is greater than 58

Memory Aid:

Small side < Large side Smaller number goes on small side
Larger number goes on large side

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| | |
|-------------|---|
| = | If two values are equal, we use the "equals" sign |
| < | But if one value is smaller than another, we can use a "less than" sign. |
| > | And if one value is bigger than another, we can use a "greater than" sign |

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When comparing decimal numbers, first look at the whole number (the part in front of the decimal).

If those numbers are the same, look at the first number after the decimal in both numbers.

Then go on to the second and so on until you can determine which number is greater.

Write each pair with >, < or =.

- | | |
|--------------------------------------|--|
| 1. 7.25 <input type="text"/> 7.31 | 11. 0.36 <input type="text"/> 0.12 |
| 2. 1.022 <input type="text"/> 1.111 | 12. 0.0087 <input type="text"/> 0.0125 |
| 3. 5.60 <input type="text"/> 5.6 | 13. 0.89 <input type="text"/> 0.9 |
| 4. 8.35 <input type="text"/> 0.99 | 14. 0.6 <input type="text"/> 0.213 |
| 5. 2.321 <input type="text"/> 2.015 | 15. 0.564 <input type="text"/> 0.654 |
| 6. 1.030 <input type="text"/> 1.303 | 16. 895.6 <input type="text"/> 254.9 |
| 7. 0.002 <input type="text"/> 0.010 | |
| 8. 54.1 <input type="text"/> 51.4 | |
| 9. 0.222 <input type="text"/> 0.212 | |
| 10. 0.027 <input type="text"/> 0.270 | |

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Ratios and Proportions

A **ratio** is a comparison of two numbers or quantities.

For example, "3 dollars per gallon" is a ratio.

Or, "40 kilometers per 1 hour".

Or, 15 girls versus 14 boys.

Or, 569 words in 2 minutes.

Or, 23 green balls to 41 blue balls, etc.

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RATIO: a comparison between two numbers with the **same** units

Can be written in several ways:

a) 12 to 40

b) 12 : 40

c) $\frac{12}{40}$

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Skill Builder: Reduce the ratios

1. $\frac{4}{16} =$

2. $\frac{3}{12} =$

3. $\frac{25}{75} =$

4. $\frac{15}{21} =$

5. $\frac{8}{18} =$

6. $\frac{45}{100} =$

7. $\frac{20}{50} =$

8. $\frac{3}{21} =$

9. $\frac{7}{56} =$

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A **proportion** is a name we give to a statement that two ratios are equal.

Tell whether each pair of ratios forms a proportion. (Hint: Reduce the ratio, if possible to compare.)

Tell whether each pair of ratios forms a proportion.

1. $\frac{6}{9}$ $\frac{10}{14}$

2. $\frac{6}{4}$ $\frac{12}{8}$

3. $\frac{2}{3}$ $\frac{6}{8}$

4. $\frac{27}{15}$ $\frac{45}{30}$

5. $\frac{8}{14}$ $\frac{20}{35}$

6. $\frac{3}{4}$ $\frac{27}{36}$

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Solving Proportions

Use the following steps to solve all proportions:

1. Cross Multiply.
2. Set the products equal to each other.
3. Solve for the variable by dividing by the number next to the variable.

1. $\frac{x}{10} = \frac{3}{5}$

2. $\frac{6}{9} = \frac{x}{15}$

3. $\frac{27}{21} = \frac{p}{14}$

4. $\frac{4}{7} = \frac{x}{84}$

5. $\frac{5}{2} = \frac{2}{x}$

6. $\frac{t}{4} = \frac{5}{10}$

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Skill Builder: Solve for x

1. $\frac{x}{10} = \frac{40}{50}$

2. $\frac{12}{16} = \frac{18}{x}$

3. $\frac{56}{64} = \frac{x}{8}$

4. $\frac{18}{27} = \frac{36}{x}$

5. $\frac{x}{2056} = \frac{3}{4}$

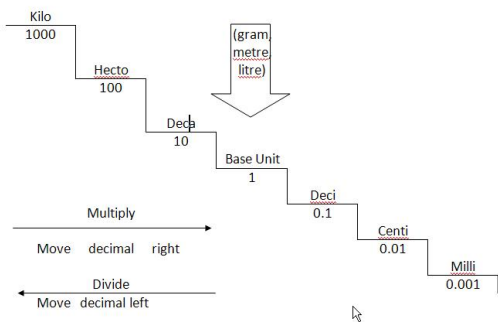
6. $\frac{3}{12} = \frac{15}{x}$

7. $\frac{3}{5} = \frac{x}{460}$

8. $\frac{25}{x} = \frac{40}{200}$

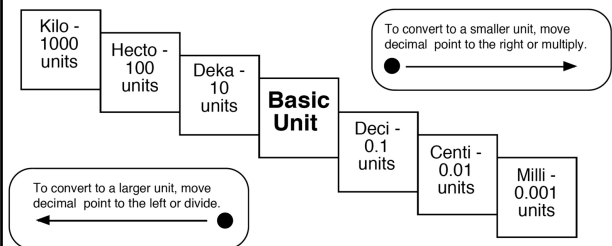
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Converting SI (metric) Units



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Metric Conversion Chart



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Try these conversions, using the ladder method.

1000 mg = _____ g

1 L = _____ mL

160 cm = _____ mm

14 km = _____ m

109 g = _____ kg

250 m = _____ km

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Compare using <, >, or =.

56 cm ○ 6 m

7 g ○ 698 mg

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Try these conversions, using the ladder method.

1) 2000 mg = _____ g

6) 5 L = _____ mL

11) 16 cm = _____ mm

2) 104 km = _____ m

7) 198 g = _____ kg

12) 2500 m = _____ km

3) 480 cm = _____ m

8) 75 mL = _____ L

13) 65 g = _____ mg

4) 5.6 kg = _____ g

9) 50 cm = _____ m

14) 6.3 cm = _____ mm

5) 8 mm = _____ cm

10) 5.6 m = _____ cm

15) 120 mg = _____ g

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Compare using <, >, or =.

16) 63 cm ○ 6 m

17) 5 g ○ 508 mg

18) 1,500 mL ○ 1.5 L

19) 536 cm ○ 53.6 dm

20) 43 mg ○ 5 g

21) 3.6 m ○ 36 cm

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1. Convert the following to grams (g):

| Before converting | Move decimal to left or right? | After converting |
|-------------------|--------------------------------|------------------|
| 1.0 kg | | g |
| 2.5 kg | | g |
| 0.045 kg | | g |
| 100 mg | | g |
| 2400 mg | | g |

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2. Convert the following to metres (m):

| Before converting | Move decimal to left or right? | After converting |
|-------------------|--------------------------------|------------------|
| 4 mm | | m |
| 15.6 km | | m |
| 0.005 Mm | | m |
| 1,000,000 μ m | | m |
| 2400 mg | | m |

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Percent

Estimating Percents

Sometimes we don't need an exact calculation, but an estimation is sufficient.

When we estimate percents, we round the percent and/or what we are taking a percent of until we can easily use mental math to find an approximation of the percentage.

We use the symbol " \approx " to mean "approximately."

Estimate 22% of 237

22% is about 20%
237 is about 240
20% of 240 \approx 48



Estimate 90% of 300

10% of 300 is 30.
300 - 30 is 270.
The estimate is 270.



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| | | | |
|--------------|---------------|----------------------------|--------------|
| You try: | | | |
| a) 25% of 64 | b) 30% of 150 | c) $33\frac{1}{3}\%$ of 27 | d) 90% of 80 |
| | | | |

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| | | | |
|------------------------|--------------|---------------|--------------|
| Estimate the percents: | | | |
| e) 22% of 61 | f) 34% of 24 | g) 52% of 141 | h) 82% of 31 |
| | | | |

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Calculating Percentages

To calculate a percentage of a number, change the percent into a decimal (Divide by 100) and multiply by the number.

Ex: 35% of 400

$$= 0.35 \times 400$$

$$= 140$$

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Calculate the percentage.

| | | | |
|--------------|---------------|----------------------------|--------------|
| a) 25% of 64 | b) 30% of 150 | c) $33\frac{1}{3}\%$ of 27 | d) 90% of 80 |
| | | | |
| e) 22% of 61 | f) 34% of 24 | g) 52% of 141 | h) 82% of 31 |
| | | | |

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Calculate the following quantities

A) 15% of 70 =

B) 80% of 6,000 =

C) 52% of 150 =

Calculate each value as a percent.
(Divide and multiply by 100.)

1. 14 out of 200

2. 25 out of 40

3. 18.5 out of 22

4. 3.4 out of 7.6

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