

Using Mental Math to Solve Percent Applications

Name Key  
 Block \_\_\_\_\_ Date \_\_\_\_\_

Sports and Grades and Miscellaneous

If we are given the percent and asked to find a part of something, make a \_\_\_% of \_\_\_\_\_ problem and use our mental math techniques to solve it.

Ex. Find how many redheads there are in a school of 300 students if 1% of the students are redheads.

Find 1% of 300

1% is 1/100 so move the decimal point to the left 2 places and get 3 redheads.

If we need to find the percent, ask yourself what fraction is represented. Then convert the fraction to a percent.

Ex. There are 10 redheads in a school with 200 students. What percent does this represent?

Think..  $\frac{\text{redheads}}{\text{all students}} = \frac{10}{200} = \frac{5}{100} = 5\%$

<p>1) A middle school team has a record of 8 wins and 2 losses. Find their win percentage.</p> <p><u>fraction first</u></p> $\frac{\text{wins}}{\text{all}} = \frac{8}{10}$ <p style="text-align: center;">80%</p>	<p>2) 15 of the 25 students in block G math got an A on their last test. What percent does this represent?</p> $\frac{A's}{\text{all}} = \frac{15 \div 5}{25 \div 5} = \frac{3}{5}$ <p style="text-align: center;">60% got A's</p>	<p>3) <u>33 1/3%</u> of the Easton family budget goes to their housing costs. If their budget for the month is \$3600, how much money will go to housing?</p> <p><math>33\frac{1}{3}\%</math> of <u>3600</u></p> $\frac{1}{3}$ <p style="text-align: center;">\$1200</p>	<p>4) Tony made 18 of the 30 free throws he attempted in this month's games. What percent of his free throws did he make?</p> $\frac{\text{made shots}}{\text{attempted}} = \frac{18 \div 6}{30 \div 6}$ <p style="text-align: center;">3/5</p> <p style="text-align: center;">60%</p>
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### Tips at Restaurants

In the United States waiters and waitresses are part of the service industry and we are expected to give them a percentage of our restaurant bill. This amount of money is called a tip or a gratuity.

The expectation is that you give between 15% and 20% depending on the type of restaurant and quality of the service.

We can calculate the tip or we can calculate the restaurant bill that includes the tip (the total of the bill + the tip)

If we know the amount of the bill and the tip, we can calculate the percent tip that have been given. When the question says, find the percent, find the fraction first.  $\frac{\text{tip}}{\text{bill}}$  Then convert the fraction to a percent.

<p>1) If the total of the restaurant bill is \$80, find how much money a <u>15% tip</u> will be.</p> <p>15% of 80 10% + 5% 8 + 4 \$12 tip</p>	<p>2) Susan gives a \$4 tip on a restaurant bill that is \$20. What <u>percent gratuity</u> did she leave?</p> <p><math>\frac{\text{gratuity}}{\text{bill}} = \frac{4}{20} = \frac{1}{5}</math> 20% tip</p>	<p>3) Jared pays a <u>15% tip</u> on a dinner that cost \$50. What is the <u>total</u> he pays including the tip?</p> <p>15% of 50 10% + 5% 5 + 2.50 \$7.50 tip</p> <p>50 + 7.50 \$57.50</p>	<p>4) The dinner bill for the Armstrong family was \$120. The total they paid including tip was \$144. What percent gratuity did they leave?</p> <p><math>\frac{\text{gratuity}}{\text{bill}} = \frac{24}{120} = \frac{2}{10} = \frac{1}{5}</math> 20% tip</p>
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Sales at Store

Items have an original (or regular) price.

If the item is marked 25% off, it means you save 25% of the regular price. We say it is the % off or % discount or % saved. To find the sale price you would subtract the dollars saved from the regular price.

If you save 25% of the regular price, it means you are paying 75% of the regular price. What you pay is called the sale price.

<p>1) The regular price of an item is \$90. It is marked <u>10% off</u>. How much money do you <u>save</u>?</p> <p>10% of 90 <math>\frac{1}{10}</math> \$9 saved</p>	<p>2) The regular price of an item is \$250. There is a <u>20% discount</u>. What is the <u>sale price</u>?</p> <p>20% of 250 <math>\frac{1}{5}</math> \$50 discount</p> <p>250 - 50 \$200 sale price</p>	<p>3) An item is <u>discounted 25%</u>. If the regular price is \$360, find the <u>sale price</u>.</p> <p>25% of 360 <math>\frac{1}{4}</math> \$90 off</p> <p>360 - 90 \$270</p>	<p>4) The regular price of an item is \$400. There is a <u>15% discount</u>. How much money will you <u>save</u> buying the item on sale?</p> <p>15% of 400 10% + 5% 40 + 20 \$60 saved</p>
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Paying Sales Tax on Items

Sales tax varies from state to state. In Connecticut we pay 6.35% sales tax (not a "nice" number)

If sales tax is 4% we find 4% of the price to find the tax.

If we want the total price including tax we add the tax amount to the price or the total bill (if we buy more than one item)

If we want to find the tax rate (percent), we make the fraction  $\frac{\text{amount of tax}}{\text{total cost}}$  and convert that fraction to a percent

<p>1) In a certain state, the <u>sales tax is 5%</u>. How <u>much tax</u> will you pay on an item that costs \$88?</p> <p>5% of 88 10% ÷ 2 8.80 ÷ 2 <u>\$4.40 tax</u></p>	<p>2) Sara's shopping spree at a store came to a total of \$300. She must pay <u>sales tax that is 6%</u>. How much <u>tax</u> will she pay?</p> <p>6% of 300 <math>\frac{6}{100}</math> <math>\frac{1}{100}</math> of 300 = 3 x 6 <u>\$18 tax</u></p>	<p>3) Dan paid \$24 for an item that included the tax. The cost without tax was <del>\$20</del><sup>20</sup>. What <u>percent sales tax</u> was he charged?</p> <p><math>\frac{\text{tax}}{\text{item price}} = \frac{4}{20} = \frac{1}{5}</math> 24 -20 <u>\$4 tax</u> <u>20% Sales tax</u></p>	<p>4) Find the <u>total cost</u> including sales tax of a \$20,000 car if the <u>sales tax is 8%</u>.</p> <p>8% of 20,000 <math>\frac{8}{100}</math> <math>\frac{1}{100}</math> of 20,000 = 200 x 8 <u>1600 tax</u> 20000 + 1600 <u>\$21,600 total</u></p>
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