

Elementary algebra
Class notes
Percent and Mixture Problems (section 2.6)

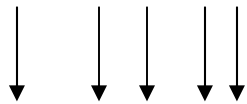
Knowing what
“percent” means will
help a lot.

“Percent” means “per 100” or “part of 100”

For example, 20% means “20 parts out of every 100 parts”. We could write 20% as $\frac{20}{100}$ or .20 (if we do that division).

Do you remember the
shortcut for turning
percents into decimals?

expl 1: What number is 16% of 70?



These problems
can usually be
directly translated.

Percent problems compare parts to the whole. Imagine you have a whole 70 dollars or meters or frogs or whatever. And, 16% of that 70 (or 11.2 dollars, meters, frogs, etc.) would be a **part of that whole**. The trick is to figure out what is the part and what is the whole in these problems.

$percent = \frac{part}{whole}$
or
 $percent \cdot whole = part$

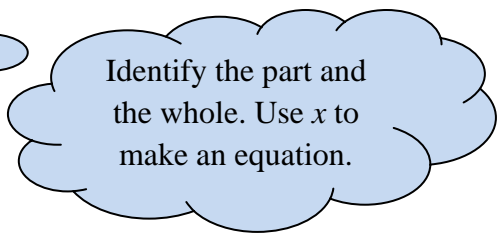
Alternatively,
 $\frac{percent\ number}{100} = \frac{part}{whole}$

expl 2: The number 45 is 25% of what number?

Identify the part and
the whole. Use x to
make an equation.

Check yourself! Does your answer make sense?

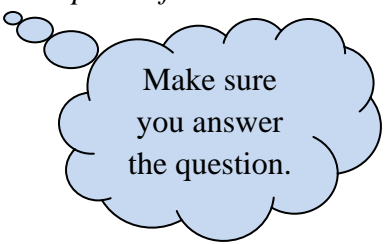
expl 3: The number 14.8 is what percent of 60?



Identify the part and the whole. Use x to make an equation.

expl 4: Solve. Round to the nearest cent.

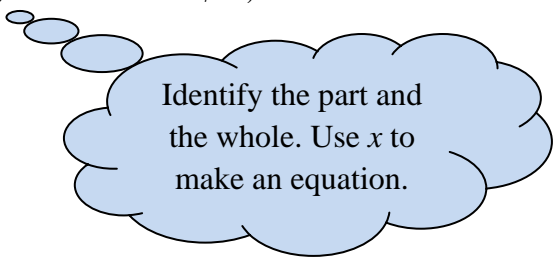
A music store is advertising a 25%-off sale. Find the discount and sales price of a CD that sells regularly for \$13.



Make sure you answer the question.

expl 5: Solve. Round to the nearest whole percent.

The cost of attending a private college rose from \$19,000 in 2000 to \$22,200 in 2006. Find the percent increase.



Identify the part and the whole. Use x to make an equation.

Mixture Problems:

Some people swear by setting up a table for mixture problems. You may also find thinking about the physical situation and the verbal models below will help. I imagine the **pure substance** (pure antibiotics, in example 6 below) settling to the bottom of each bottle of solution. This is pure, 100% concentrate. Then I picture these amounts of pure substance combining when I pour the two solutions together.

$$\boxed{\begin{array}{l} \text{amount of } \mathbf{pure} \\ \mathbf{substance} \text{ in first} \\ \text{solution} \end{array}} + \boxed{\begin{array}{l} \text{amount of } \mathbf{pure} \\ \mathbf{substance} \text{ in} \\ \text{second solution} \end{array}} = \boxed{\begin{array}{l} \text{amount of } \mathbf{pure} \\ \mathbf{substance} \text{ in} \\ \mathbf{final} \text{ solution} \end{array}}$$

$$\boxed{\begin{array}{l} \text{amount of } \mathbf{pure} \\ \mathbf{substance} \text{ in a} \\ \text{given solution} \end{array}} = \boxed{\begin{array}{l} \text{percent} \\ \text{concentration} \\ \text{(decimal form)} \end{array}} * \boxed{\begin{array}{l} \text{amount of } \mathbf{total} \\ \mathbf{solution} \end{array}}$$

expl 6: Solve. Complete the table to help with calculations.

How many cubic centimeters (cc) of a 25% antibiotic solution should be added to 10 cc of 60% solution in order to get a 30% antibiotic solution?

Let x be what you are asked to find.

	Number of cc	*	Antibiotic Strength	=	Amount of Pure Antibiotic
25% Solution					
60% Solution					
30% (Final) Solution					

Always use decimal forms of percentages in calculations.

expl 7: The owner of a chocolate shop wants to make a new trail mix. How many pounds of chocolate-covered peanuts worth \$5 a pound should be mixed with 10 pounds of granola bites worth \$2 a pound to make a mixture that will sell for \$3 a pound?

Let x be what you are asked to find.

total cost of
peanuts

+

total cost of
granola bites

=

total cost of
mixture

How do you
figure total
cost?