

# Mixture Word Problems

A **mixture** problem involves pouring two different mixtures into a container to create a new third mixture. Two facts you will be given about the mixtures: the *percent* and *amount* of each mixture.

To solve mixture problems, complete the table and follow these rules:

Always change percent to a decimal by moving it two places to the right.

The amount of the **first mixture** + amount of the **second mixture** = amount of **total mixture**

	Percent	Amount	Total
<b>First mixture</b>	%	A	%(A)
<b>Second mixture</b>	%	A	%(A)
<b>Total mixture</b>	%	A	%(A)



## Example

A mixture containing 3% boric acid is to be mixed with 1 quart of a mixture that is 17% boric acid in order to obtain of 13% boric acid. How much of the 3% solution must be used?

	Percent	Amount	Total
<b>3% boric acid</b>	.03	x	.03x
<b>17% boric acid</b>	.17	1	.17(1)
<b>13% boric acid</b>	.13	x + 1	.13(x + 1)

$$\begin{aligned}
 \text{first mix} + \text{second mix} &= \text{total mix} \\
 .03x + .17(1) &= .13(x + 1) \\
 .03x + .17 &= .13x + .13 \\
 \underline{-.13x} \quad \underline{-.13x} & \\
 -.10x + .17 &= .13 \\
 \underline{-.17} \quad \underline{-.17} & \\
 -.10x &= -.04 \\
 x &= 4
 \end{aligned}$$

	Percent	Amount	Total
<b>3% boric acid</b>	.03	4	.03(4) =
<b>17% boric acid</b>	.17	1	.17(1) = .17
<b>13% boric acid</b>	.13	4+1=5	.13(5) = .65

4 quarts of 3% boric acid is needed.



## Practice

Solve.

1. A hair dye is made by blending 7% and 4% hydrogen peroxide solutions. How many ml of each are used to make a 300 ml solution that is 5% hydrogen peroxide.
2. A doctor orders 30 grams of a 54% cough syrup. The pharmacist has only bottles of 30% and 75% cough syrup. How much of each should the pharmacist use to comply with the doctor's order?
3. A chemist mixed a 60% alcohol solution with a 20% alcohol solution to make a 50% alcohol solution. How many litres of each were used to make 100L of the 50% solution?
4. How many ounces of pure chocolate (100%) must be added to 150 oz of 50% chocolate topping to create a topping that is 73% chocolate?
5. How many gallons of a 15% acid solution must be mixed with 5 gallons of a 20% acid solution to make a 16% acid solution?