

Names: _____

Calculating percents. Always show all your work, each step, with units.

How serious is it if you lose ten dollars? If it is all you have with you, you may miss lunch or run out of gas on the way home. If you had \$40 in your wallet, losing \$10 is unfortunate, but probably won't ruin your day. It all depends on the **percent** that you lose. In the first case, you lost 100% of your money. In the second case, the % lost was a lot less. Percent (defined as parts per hundred) can be calculated:

$$\text{percent} = \frac{\text{part}}{\text{whole}} \times 100 \quad \text{In the case above, you lost } \frac{\$10}{\$40} \times 100 = 25\%$$

To calculate percent, **both the "part" and the "whole" must be expressed in the same unit.** (We used dollars in the above example.) Many of the problems in chemistry will base percent on mass.

Problems:

1. If 42 students start a chemistry class, but only 36 complete it, calculate the % of students completing the class.

2. A baking mix was made by blending 15.0 lb of flour, 2.5 lb of lard, and 1.5 lb of sugar. Calculate the % of the mix that is lard.

3. A sample of apple is heated in an oven to drive off the water. If a piece of apple has a mass of 4.50 grams before heating, and a mass of 0.75 grams after heating, calculate the percent water in the apple. (Hint – find the mass of water first)

4. The body of a 150-lb person at approximately optimum weight contains 90.0 pounds of water and 30.0 pounds of fat. The other 30.0 pounds are mostly protein, carbohydrate compounds, and the major calcium and phosphorus compounds of your bones. Vitamins, other minerals, and misc., constitute only a fraction of a pound. Calculate the percent water, **and** the percent fat, in the person's body from the above information.
5. A chemist analyzes a 7.345 gram rock and finds that it contains 0.02154 grams of gold. What is the percent gold in the rock?
6. Bronze is an alloy made by melting together copper (Cu) and tin (Sn) together, mixing it thoroughly, and then letting it solidify. If 114 lb of Cu was used to make 155 lb of bronze, calculate the % Sn in the bronze. (Hint: must find pounds of Sn first)
7. Mary's baby weighs 3546 grams. How many pounds is this?
8. A basket ball player is 7.0 feet tall. How many meters is this?