



The Imperial System

The imperial system is the standard system of measurement in the United States.

Because it's so common, Canadians need to be familiar with the imperial as well as the metric system.

Unlike the metric system, the imperial system uses fractions to express partial measures. Be sure to review the fraction rules before proceeding with this worksheet.

Here are the most common equivalents. The measurement at the top of each column is equal to the measurements listed underneath it:



Mass / Weight

1 pound (lb)	1 (dry) ounce* (oz)
16 oz	$\frac{1}{16} lb$

Length

1 yard (yd)	1 foot (ft)	1 inch (in)
3 ft	$\frac{1}{3} yd$	$\frac{1}{36} yd$
36 in	12 in	$\frac{1}{12} ft$

Volume / Capacity

1 gallon (gal)	1 quart (qt)	1 pint (pt)	1 cup (c)	1 fluid ounce* (fl oz)	1 tablespoon (tbsp)	1 teaspoon (tsp)
4 qt	$\frac{3}{4} gal$	$\frac{1}{4} gal$	$\frac{1}{4} qt$	$\frac{1}{8} c$	$\frac{1}{2} fl oz$	$\frac{1}{3} tbsp$
8 pt	2 pt	$\frac{1}{2} qt$	$\frac{1}{2} pt$	2 tbsp	3 tsp	
16 c	4 c	2 c	8 fl oz	6 tsp		

Wet ounces and dry ounces are different measurements



To use these conversions, set up a problem like below:

$$\text{the number from the problem} \times \frac{\text{conversion factor}}{\text{conversion factor}} = \text{answer}$$

these two numbers should be in the same units this number should be in the units you want

Example 1: Convert 12 cups of apple juice to quarts.

Answer: Find the conversion factor for cups to quarts.
 We could use either of the two below:
 4 cup = 1 quart
 1 cup = $\frac{1}{4}$ quart

Write the conversion factor so the unit on the bottom of the fraction matches the unit given and the unit on the top is the unit we want to get.

$$\frac{1 \text{ quart}}{4 \text{ cups}}$$

Multiply 12 cups by the conversion factor.

$$12 \text{ c} \times \frac{1 \text{ qt}}{4 \text{ c}} = 3 \text{ qt}$$

The answer is 3 quarts.

Sometimes measurements combine different units, for example 1 lb, 4 oz of butter. If the recipe needs to be scaled, or converted to a different unit, the first step is to change the quantity given into a single unit.

Example 2: Triple a recipe that calls for 2 lb, 6 oz of flour.

Answer: We want a single unit. Ounces will be easier to work with.

Convert the 2 lb of flour into ounces.

$$2 \text{ lb} \times \frac{16 \text{ oz}}{1 \text{ lb}} = 32 \text{ oz}$$

1 lb = 16 oz

Add the 6 oz.

$$32 \text{ oz} + 6 \text{ oz} = 38 \text{ oz}$$

Multiply by 3 to triple the recipe.

$$3 \times 38 \text{ oz} = 114 \text{ oz}$$

114 oz would be difficult to measure out, so we convert back to pounds. We want as many whole pounds as we can get and we will leave the remainder in oz.

$$114 \text{ oz} \times \frac{1 \text{ lb}}{16 \text{ oz}} = 7.125 \text{ lb}$$

We keep the whole number (7 lbs) and find out how many ounces are left.

$$114 \text{ oz} - \left(7 \text{ lbs} \times \frac{16 \text{ oz}}{1 \text{ lb}}\right) = 2 \text{ oz}$$

Final answer is 7 lbs, 2 oz.



Remember to always do a common sense check on your problems!

You know one pound is larger than one ounce. But if you convert ounces to lbs in your problem and get a bigger number, you should realize something is wrong and check your work.

Practice Problems

Convert the measurements on the left to the units indicated on the right.

	3 lb	=	48	oz
1.	2 ½ lb	=		oz
2.	80 oz	=		lb
3.	2 yd	=		in
4.	36 in	=		ft
5.	17 ¼ ft	=		yd
6.	16 pt	=		gal
7.	0.5 gal	=		qt
8.	40 cups	=		gal
9.	3 ¾ qt	=		cups
10.	24 fl oz	=		cups
11.	3 tbsp	=		tsp
12.	15 tbsp	=		fl oz
13.	18 tsp	=		fl oz
14.	12 tsp	=		tbsp
15.	36 fl oz	=		cups
16.	1 ¼ cups	=		fl oz
17.	2 lb, 12 oz	=		oz
18.	52 oz	=		lb, oz
19.	2 tbsp, 6 tsp	=		fl oz
20.	2 ft, 4 in	=		yd

21. Danice is preparing a potato sourdough. A single batch takes 5 oz grated boiled potatoes. If she wants to quadruple the batch, what weight of potatoes would she need? (hint – the answer will be in two units)
22. Kat is preparing vinaigrette and needs 18 fl oz of honey. She only has measuring cups, tablespoons, and teaspoons to work with. How much honey should she measure out?



23. Esteban is scaling down a recipe for lemon truffles. 4 lb, 14 oz white chocolate is used to make 330 truffles. He only wants to make 100 truffles. How much white chocolate does he need?

Answers

1. 40 oz
2. 5 lb
3. 72 in
4. 3 ft
5. 5.75 yd
6. 2 gal
7. 2 qt
8. 2.5 gal
9. 15 cups
10. 3 cups
11. 9 tsp
12. 7.5 fl oz
13. 3 fl oz
14. 4 tbsp
15. 4.5 cups
16. 10 fl oz
17. 44 oz
18. 3 lb, 4 oz
19. 2 fl oz
20. 0.78 yd
21. 1 lb, 4 oz potatoes
22. 2 cups, 4 tbsp honey
23. 1 lb, 7.6 oz \approx 1 lb,
8 oz white chocolate

