Unit Conversions

Metric vs. Imperial

There are two systems of measurement: metric and imperial. The metric system includes units such as grams, litres, millilitres, etc. The imperial system (which is mainly used in the U.S.) includes units such as pounds, ounces, gallons, pints, etc.). Recipes may be presented in either system, so it is important to know how to convert between the two.

The Metric System

The metric system uses the same prefixes for all different units of measure.

Kilo	Hecto	Deca	(main)	Deci	Centi	Milli
1000	100	10	1	.10	.01	.001

100 x 10 = 1000 | 10 x 10 = 100 | 1 x 10 = 1 | 1 ÷ 10 = .10 | .10 ÷ 10 = .01 | .01 ÷ 10 = .001

Each prefix means there is an increase or a decrease by a factor of 10. Starting with the main unit of 1, we can multiply by 10 to get to deca. We can then multiply deca by 10 in order to get to hecto, which is 100. We can multiply hecto by 10 to get to kilo, which is 1000.

Starting with the main unit of 1 again, we can divide by 10 to get to deci, which is .10. We can divide deci by 10 to get to centi, which is .01. We can then divide centi by 10 to get to milli, which is .001.

The end of the word will change depending on what unit of measure we are referring to; distance, mass/weight, volume.

The following tables show how metric units are converted to other metric units, by multiplying and dividing by factors of 10, as shown above.

Mass/weight:

Kilogram	Hectogram	Decagram	Gram	Decigram	Centigram	Milligram
1Kg	1Hg	1Dg	1g	1dg	1cg	1mg
1000g	100g	10g	1g	.10g	.01g	.001g

Volume:

Kilolitre	Hectolitre	Decalitre	Litre	Decilitre	Centilitre	Millilitre
1KL	1HL	1DL	1L	1dL	1cL	1mL
1000L	100L	10L	1L	.10L	.01L	.001L

Some of these units are more common than others when baking. The following tables show the units that will be used on the test, and how to convert between them.

Kilogram			Gram			Milligram
1Kg			1g			1mg
1000g			1g			.001g

1 x 1000 = 1000

1 ÷ 1000 = .001

1,000 ÷ 1,000,000 = .001

.001 x 1,000,000 = 1000

			Litre			Millilitre
			1L			1mL
			1L			.001L

1 ÷ 1000 = .001

.001 x 1000 = 1

The Imperial System

The only imperial units on the test are pounds and dry ounces. The conversion table below shows how those units convert between each other.

Mass/weight:

1 pound (lb)	1 dry ounce (oz)
16 oz	1/16 lb

lb x 16oz

oz ÷ 16lb

Sample question 1: Convert 3.5 pounds to ounces. _____oz.

3.5lb x 16oz = 56oz

Sample question 2: Convert 85 ounces to pounds. _____lb

85oz ÷ 16lb = 5.3 lb

Measurements can also be given in a mixture of pounds and ounces, as in the following question.

Sample question 3: Convert 6 pounds 2 ounces to ounces. _____oz.

In this example, we only need to convert the pounds to ounces, and then add it to the ounces already given in the question:

6lb 2oz

Step 1: 6 lb x 16 = 96 oz

Step 2: 96 oz + 2oz = 98 oz

After the answer has been converted to ounces, you can convert into other units, such as millilitres or grams.

Important: Some questions may be in pounds and ounces, where the answer needs to be in pounds and ounces. In this case, it is easier to **not** convert the pounds into ounces.

Sample question 4:

5 lb. 2 oz.
6 lb. 4 oz.
+ 2 lb. 5 oz.

Step 1: Add the pounds together
5 + 6 + 2 = 13 lb
Step 2: Add the ounces together
2 + 4 + 5 = 11 oz
Step 3: Write answers in lbs oz format
13lb 11oz

Remember that there are **16 ounces in 1 pound**. That means that if the ounces add up to be **more than 16**, you must convert them into pounds.

Sample question 5:

2 lb. 3 oz.
7 lb. 5 oz.
+ 5 lb. 12 oz.

Step 1: Add the pounds together
2 + 7 + 5 = 14 lb
Step 2: Add the ounces together
3 + 5 + 12 = 20 oz

* 16 ounces are in 1 pound. We have 20 ounces. We will take 16 of the ounces and convert them into an additional pound, which we will add the number of pounds that we first calculated in Step 1. This gives us 15 pounds in total.

16 oz = 1lb
14 lb + 1 lb = 15 lb

* Then we will have 4 ounces left.

20oz – 16 = 4oz left over

Step 3: Write answers in lbs oz format
15lb 4oz

Conversions between Imperial and Metric

Converting between two different units is done by multiplying or dividing by a standard conversion rate. You can find the conversion rates on the conversion table. This conversion table will be provided on the test.

Weight		
1 ounce	=	28.35 grams
1 gram	=	.0353 ounce
16 ounces	=	1 pound
1 pound	=	454 grams
1 kilogram	=	2.2 pounds

Abbreviations		
ounce	=	oz.
gram	=	g
pound	=	lb.
kilogram	=	kg
millilitre	=	mL
litre	=	L

Volume		
1 milliliter	=	.0353 ounces
1 fluid ounce	=	28.35 milliliter
1 litre	=	35.2 fluid ounce
1 millilitre	=	.001 litre

Temperature		
F	=	(1.8 x C) + 32
C	=	5/9 x (F - 32)

How to use a Conversion Table

Sample question 1: Convert 790 millilitres to litres. _____L

This question has given us a number, 790, in millilitres. The question is asking us to give the same number in a different unit, which is litres.

Step 1: Look at the conversion table to find where millilitres are being converted to litres.

Volume	
1 mL	= .0353 oz.
1 fluid oz.	= 28.35 mL
1 litre	= 35.2 fluid oz.
1 mL	= .001 L

Step 2: Multiply or divide by the conversion rate.

790mL x .001 = .790L

If the unit we want to convert to is larger than the unit that we are in, then we will multiply by the conversion rate. If the unit we want to convert to is smaller than the unit we are in, then we will divide by the conversion rate. Litres (the unit we want to convert to) is larger than millilitres (the unit we are in), so we are going to multiply by the conversion rate.

To understand which units are larger than others, refer to the Metric System and Imperial System sections of the study guide.

Below are more examples of conversions using the conversion table.

Sample question 2: Convert 350mL to ounces.

350 mL x 0.035 oz. = 12.25 oz.

If we would like to convert 350mL to ounces, we **multiply** by the conversion rate of 0.035.

Sample question 3: Convert 26oz to millilitres.

26 oz. x 28.4 = 743mL

If we would like to convert 26oz. to millilitres, we **multiply** by the conversion rate of 28.4.

Sample question 4: Convert 60 lbs 4 oz to grams.

Step 1: Convert the pounds to ounces using the conversion rate, and then add it to the ounces given in the question.

60lb x 16 = 960 oz.

960oz + 4oz = 964oz

Step 2: Convert the ounces into grams using the conversion rate.

964oz x .035 = 33.74g

Use the conversion table to answer the following questions.

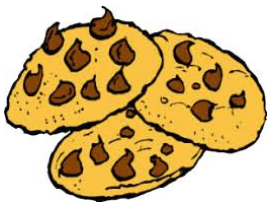
Metric > Imperial

1. Convert 3 kilograms of blueberries to pounds. _____lbs
2. Convert 70 grams of bittersweet chocolate to ounces. _____oz.

3. 1500 grams of pork roast will serve 10 portions.
   a) How many kilograms of pork roast will serve 10 portions? _____kg
   b) How many pounds of pork roast will serve 10 portions? _____lbs

4. To make 24 chocolate chip cookies, the following ingredients are needed:

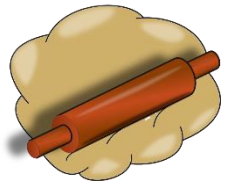
   - 1 kg wheat flour
   - 2 mL salt
   - 500 mL sugar
   - 50g butter, softened
   - 1.2kg chocolate chips



   a) How many ounces of flour are needed for 24 cookies? _____oz.
   b) How many ounces of salt are needed for 24 cookies? _____oz.
   c) How many ounces of butter are needed for 24 cookies? _____oz.
   d) How many pounds of chocolate chips are needed for 24 cookies? _____lbs

Imperial > Metric

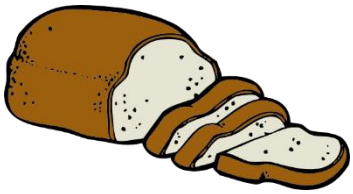
5. Convert 7 pounds, 3 ounces to grams. _____g
6. Convert 8 pounds of apples to kilograms. _____kg
7. Convert 10 ounces of sugar to grams. _____g
8. Convert 3 pounds, 2 ounces to kilograms. _____kg



9. 4 oz. of potatoes will serve 2 portions.
   a) How many grams of potatoes will serve 2 portions? _____g

10. To make 12 loaves of bread, the following ingredients are needed:
    - 6 lbs. bread flour
    - 2 oz. salt
    - 4 oz. sugar
    - 4 oz. shortening
    - 6 oz. milk powder
    - 1.5 litres water
    - 5 oz. fresh yeast

    a) How many kilograms of flour are needed for 12 loaves? _____kg
    b) How many grams of salt are needed for 12 loaves? _____g
    c) How many grams of shortening are needed for 12 loaves? _____g
    d) How many ounces of water are needed to make 12 loaves? _____L
    e) How many grams of yeast are needed for 12 loaves? _____g



Temperature

Temperature conversions use a formula rather than a conversion rate. The formulas are as follows:

To convert Celsius to Fahrenheit: (1.8 x C) + 32

To convert Fahrenheit to Celsius: 5/9 x (F - 32)

This formula is based on the differences between the two measurement systems. In Celsius, the freezing point of water is 0 degrees and the boiling point of water is 100 degrees. In Fahrenheit, the freezing point of water is 32 degrees and the boiling point of water is 212 degrees.

NOTE: the operation inside the brackets must be done first.

Sample question 1: Convert 175 degrees Celsius to Fahrenheit.

(1.8 x C) + 32

Step 1: (1.8 x 175) = 315

Step 2: 315 + 32 = **347 F**

Sample question 2: Convert 400 degrees Fahrenheit to Celsius.

Remember: the line in a fraction actually means division.

5/9 = 5÷9

5/9 x (F - 32)

Step 1: (400 – 32) = 368

Step 2: 5/9 x 368 = **204 C**

Using the conversion formulas above, solve the following questions.

11. What is 185 degrees Celsius in Fahrenheit? _____F
12. What is 425 degrees Fahrenheit in Celsius? _____C
13. What is 350 degrees Fahrenheit in Celsius? _____C
14. What is 200 degrees Celsius in Fahrenheit? _____F

Unit Conversions: Answer Sheet

1) 6.6 lbs

2) 2.45 oz

3) a) 1.5 kg

   b) 3.3 lbs

4) a) 35 oz

   b) 0.07 oz

   c) 1.75 oz

   d) 2.64 lbs

5) 3220 g

6) 3.632 kg

7) 283.5 g

8) 1.42 kg

9) a) 112 g

10) a) 2.72 kg

    b) 56 g

    c) 112 g

    d) 52.8 oz

    e) 140 g

11. 365 F

12. 218.3 C

13. 176.67 C

14. 392 F