

## Necessary Math Skills

1. The mass of a car is 1800. kg. The mass of a car tire is 2.3 kg. The tires represent what percent by mass of the car's total mass?

Total mass = 1800kg

Tire = 2.3kg

% = tires mass / total mass ( × 100%)

= tires = 4 × 2.3 = 9.2kg

= 9.2 / 1800 × 100%

= 0.00511111 × 100%

= 0.51%

2.  $PV=nRT$  ( $P \times V = n \times R \times T$ )

$n =$  \_\_\_\_\_

$$\frac{nRT}{RT} = \frac{PV}{RT}$$

$$\frac{nRT}{RT} = \frac{PV}{RT}$$

$n = \#$

$$3. \frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

$T_2 =$  \_\_\_\_\_

$$T_1 / P_1 V_1 = T_2 / P_2 V_2$$

$$T_2 / P_2 V_2 (\times P_2 V_2) = T_1 / P_1 V_1 (\times P_2 V_2)$$

$$P_2 V_2 T_2 / P_2 V_2 = T_1 / P_1 V_1 (\times P_2 V_2)$$

$$T_2 = T_1 P_2 V_2 / P_1 V_1$$

4. Given the following prices, determine the cost of one. BLT sandwich.

Loaf of bread (20 slices)	\$1.49
Head of lettuce (25 leaves)	\$1.49
Tomato (8 slices)	\$1.29
Bacon 500 g (20 strips)	\$3.99
Butter, mayo etc. per sandwich	\$0.04

Per sandwich:

- 2 slices
- 1 leaf of lettuce
- 2 slices of tomato
- 4 strips of bacon
- butter, mayo ,etc.

2 slices of bread + 1 leaf of lettuce + 2 slices of tomato + 4 pieces of bacon + butter + mayo

\$1.49 cost of a loaf of bread / 20 = cost of each slice

1.49 / 20 = \$0.07

We need 2 slices, so the cost will be  $0.07 \times 2 = \$0.14$

1 leaf of lettuce =  $1.49/25 = 0.06$  per leaf

1 tomato slice =  $1.29/8 = 0.16$  slice

bacon strip =  $3.99/20 = 0.20$  strip of bacon

$$\text{Total BLT} = 0.14 + 0.06 + 0.32 + 0.80 + 0.08 = \$1.40$$

5. What is the weight of 1 strip of bacon in question #4?

$$500\text{g} / 20 = \text{---g}$$

$$0.2\text{g}$$

6. What is the maximum number of complete sandwiches that could be made from 2 loaves of bread and 1 head of lettuce assuming you had enough of all the other ingredients?

Loaf of bread (20 slices)	\$1.49	- 2 slices
Head of lettuce (25 leaves)	\$1.49	- 1 leaf of lettuce

2 loaves of bread  $\times$  20 = 40 slices of bread total

1 head of lettuce = 25 leaves of lettuce

Limiting Reagent question in chemistry

**2** slices of bread + **1** leaf of lettuce  $\rightarrow$  1 BLT

Assume we use all the bread slices, is there enough lettuce to do so?

40 bread slices, how many leaves of lettuce do we need to make BLTs

2:1

If we have 40 slices of bread, we will need half that of lettuce = 20

Since we have lettuce left over, lettuce is in excess

Therefore, bread slices are **limiting**

**40 bread slices, we need 2 per BLT, =  $40/2 = 20$  BLTs**