

## ③ SCIENTIFIC NOTATION (sometimes called STANDARD NOTATION)

All numbers are expressed (re-written) as the product of a decimal (between 1 and 10) and a power of 10

For example:

$$2450 = 2.45 \times 10^3$$

$$0.035 = 3.5 \times 10^{-2}$$

$$1500000 = 1.5 \times 10^6$$

$$0.0004 = 4.0 \times 10^{-4}$$

\*Notice how the "decimal point" is always placed immediately after the first "non-zero" digit.

And the power of ten = the number of "places" you moved the decimal point (+ for BIG, - for SMALL numbers.)

### Exercise

Express the following numbers in Scientific notation:

1) 800 =

2) 4000 =

3) 5500 =

4) 740 =

5) 12509 =

6) 0.034 =

7) 0.0056 =

8) 0.00008 =

9) 0.125 =

10) 0.7 =

2) Round off the following numbers:

a) 3895 to the nearest 100

b) 54.48 to the nearest whole number

c) 3895 to the nearest 1000

d) 54.481 to one decimal place

e) 4.1081 to two decimal places

f) 5.176 metres to the nearest cm

g)  $4.15 \times 10^4$  grams to the nearest kg

h) 24.0519 to 3 significant figures

i) 8.094 to 2 significant figures

j)  $19.8 \times 10^5$  to 2 sign. figs.

## ANSWERS

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All numbers are expressed (re-written) as the product of a decimal (between 1 and 10) and a power of 10.

For example:

$$2450 = 2.45 \times 10^3$$

$$0.035 = 3.5 \times 10^{-2}$$

$$1500000 = 1.5 \times 10^6$$

$$0.0004 = 4.0 \times 10^{-4}$$

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And the power of ten = the number of "places" you moved the decimal point (+ for BIG, - for SMALL numbers).

#### Exercise

Express the following numbers in Scientific notation:

$$1) 800 = 8 \times 10^2 \checkmark$$

$$6) 0.034 = 3.4 \times 10^{-2} \checkmark$$

$$2) 4000 = 4 \times 10^3 \checkmark$$

$$7) 0.0056 = 5.6 \times 10^{-3} \checkmark$$

$$3) 5500 = 5.5 \times 10^3 \checkmark$$

$$8) 0.00008 = 8 \times 10^{-5} \checkmark$$

$$4) 740 = 7.4 \times 10^2 \checkmark$$

$$9) 0.125 = 1.25 \times 10^{-1} \checkmark$$

$$5) 12509 = 1.2509 \times 10^4 \checkmark$$

$$10) 0.7 = 7 \times 10^{-1} \checkmark$$

### ④ Round off the following numbers

a) 3895 to the nearest 100

$$= 3900 \checkmark$$

b) 54.48 to the nearest whole number

$$= 54 \checkmark$$

c) 3895 to the nearest 1000

$$= 4000 \checkmark$$

d) 54.481 to one decimal place

$$= 54.5 \checkmark$$

e) 4.1081 to two decimal places

$$= 4.11 \checkmark$$

f) 5.176 metres to the nearest cm

$$= 5.18 \text{ cm} \checkmark$$

g)  $4.15 \times 10^4$  grams to the nearest kg

$$= 42 \text{ kg} \checkmark$$

h) 24.0519 to 3 significant figures

$$= 24.1 \checkmark$$

i) 8.094 to 2 significant figures

$$= 8.1 \checkmark$$

j)  $19.8 \times 10^5$  to 2 sign. figs.

$$= 2.0 \times 10^6 \checkmark$$