



**Prefixes and Powers of 10**

Find out the prefixes for the following powers of 10 – the first one is done as an example:

Prefix	Symbol	Power of 10
Peta	P	$\times 10^{15}$
		$\times 10^{12}$
		$\times 10^9$
		$\times 10^6$
		$\times 10^3$
		$\times 10^{-2}$
		$\times 10^{-3}$
		$\times 10^{-6}$
		$\times 10^{-9}$
		$\times 10^{-12}$
		$\times 10^{-15}$

**Exercise 1:**

Write the following using the correct powers of 10, using the example below:

*Helpful hint: in this exercise, do NOT try and convert them to standard form, just multiply the number by the relevant power of 10 (eg: **72.4 kN = 72.4 x 10<sup>3</sup> N**)*

95 GPa = 95 x 10<sup>9</sup> Pa

30 mA

0.3 fm

400 kΩ

22 cm

4700 pF

1500 MN

74 μC

## **Exercise 2:**

Write the following using the correct powers of 10 – this time express your answer in **standard form** (help on standard form can be found in the link and video below)

<http://www.ultimatemaths.com/standard-form-conversion.htm>

[https://www.youtube.com/watch?time\\_continue=36&v=HO2krXdWyNo&feature=emb\\_logo](https://www.youtube.com/watch?time_continue=36&v=HO2krXdWyNo&feature=emb_logo)

Two examples are given below:

*You may not need to do these steps to do this exercise – they are here for help if you need it*

*Example 1: How many Watts in 45.8 kW*

$$45.8 \text{ kW} = 45.8 \times 10^3 \text{ W} = 45\,800 \text{ W}$$

$$45\,800 \text{ W} = 4.5 \times 10^4 \text{ W}$$

*Example 2: How many Farads in 0.25  $\mu\text{F}$ ?*

$$0.25 \mu\text{F} = 0.25 \times 10^{-6} \text{ F} = 0.000\,000\,025 \text{ F}$$

$$0.000\,000\,025 \text{ F} = 2.5 \times 10^{-7} \text{ F}$$

1. How many metres in 2.4 km?
2. How many Joules in 8.1 MJ?
3. Convert 326 GW into W.
4. Convert 54 600 mm into m.
5. How many Newtons in 240 kN?
6. Convert 0.18 nm into m.
7. Convert 632 nm into m.
8. Convert 1002 mV into V.
9. How many eV in 0.511 MeV?
10. How many m in 11 km?

## Converting Powers of 10

How many mm in 1 m? Write your answer in standard form using the correct power of 10

How many mm<sup>2</sup> in 1 m<sup>2</sup>? Write your answer in standard form using the correct power of 10  
(Hint: to do this, square your answer above)

How many m in 1 mm? Write your answer in standard form using the correct power of 10

How many m<sup>2</sup> in 1 mm<sup>2</sup>? Write your answer in standard form using the correct power of 10  
(Hint: to do this, square your answer above)

Use your answers and method to complete the table below using the form  $1 \times 10^x$ :

Quantity							
1m	=		mm		μm		nm
1 m <sup>2</sup>	=		mm <sup>2</sup>				
1 mm	=		m				
1 mm <sup>2</sup>	=		m <sup>2</sup>				
1 Pa	=	1	Nm <sup>-2</sup>				
1 kPa	=	1	kNm <sup>-2</sup>				
1 MPa	=	1	MNm <sup>-2</sup>		Nm <sup>-2</sup>		Nmm <sup>-2</sup>
1 GPa	=	1	GNm <sup>-2</sup>		Nm <sup>-2</sup>		