Remember, the metric system is built upon base units (grams, liters, meters, etc.) and prefixes which represent orders of magnitude (powers of 10) of those base units. In other words, a single "prefix unit" (such as *milli*gram) is equal to some order of magnitude of the base unit (such as gram). Below are the metric prefixes that you are responsible for and examples of unit equations and conversion factors of each. It does not matter what metric base unit the prefixes are being applied to, they always act in the same way.

Metric prefixes and exponents that you need to know.

Larger than the base unit

tera	1 T =	**1x10^{12}**	1 T**fl** = **1x10^{12} fl** or **1x10^{12}** fl = 1 Tfl	$\frac{1\,\mathbf{Tfl}}{1\times10^{12}\ \mathbf{fl}}$ or $\frac{1\times10^{12}\ \mathbf{fl}}{1\,\mathbf{Tfl}}$
giga	1 G =	**1x10^{9}**	1 G**B** = **1x10^{9} B** or **1x10^{9}** B = 1 GB	$\frac{1\,\mathbf{GB}}{1\times10^{9}\ \mathbf{B}}$ or $\frac{1\times10^{9}\ \mathbf{B}}{1\,\mathbf{GB}}$
mega	1 M =	**1x10^{6}**	1 MΩ = **1x10^{6} Ω** or **1x10^{6}** Ω = 1 MΩ	$\frac{1\,\mathbf{M\Omega}}{1\times10^{6}\ \mathbf{\Omega}}$ or $\frac{1\times10^{6}\ \mathbf{\Omega}}{1\,\mathbf{M\Omega}}$
kilo	1 k =	**1x10^{3}**	1 k**J** = **1x10^{3} J** or **1x10^{3}** J = 1 kJ	$\frac{1\,\mathbf{kJ}}{1\times10^{3}\ \mathbf{J}}$ or $\frac{1\times10^{3}\ \mathbf{J}}{1\,\mathbf{kJ}}$

Each of these have positive exponents because each prefix is larger than the base unit (increasing orders of magnitude). Remember, the power of 10 is always written with the base unit whether it is on the top or the bottom of the ratio.

-- BASE UNIT --

Smaller than the base unit

deci	1 d =	**1x10^{-1}**	1 d**L** = **1x10^{-1} L** or **1x10^{-1}** L = 1 dL	$\frac{1\,\mathbf{dL}}{1\times10^{-1}\ \mathbf{L}}$ or $\frac{1\times10^{-1}\ \mathbf{L}}{1\,\mathbf{dL}}$
centi	1 c =	**1x10^{-2}**	1 c**Pa** = **1x10^{-2}Pa** or **1x10^{-2}** Pa = 1 cPa	$\frac{1\,\mathbf{cPa}}{1\times10^{-2}\ \mathbf{Pa}}$ or $\frac{1\times10^{-2}\ \mathbf{Pa}}{1\,\mathbf{cPa}}$
milli	1 m =	**1x10^{-3}**	1 m**A** = **1x10^{-3} A** or **1x10^{-3}** A = 1 mA	$\frac{1\,\mathbf{mA}}{1\times10^{-3}\ \mathbf{A}}$ or $\frac{1\times10^{-3}\ \mathbf{A}}{1\,\mathbf{mA}}$
micro	1 μ =	**1x10^{-6}**	1 μ**g** = **1x10^{-6} g** or **1x10^{-6}** g = 1 μg	$\frac{1\,\mu\mathbf{g}}{1\times10^{-6}\ \mathbf{g}}$ or $\frac{1\times10^{-6}\ \mathbf{g}}{1\,\mu\mathbf{g}}$
nano	1 n =	**1x10^{-9}**	1 n**m** = **1x10^{-9} m** or **1x10^{-9}** m = 1 nm	$\frac{1\,\mathbf{nm}}{1\times10^{-9}\ \mathbf{m}}$ or $\frac{1\times10^{-9}\ \mathbf{m}}{1\,\mathbf{nm}}$
pico	1 p =	**1x10^{-12}**	1 p**s** = **1x10^{-12} s** or **1x10^{-12}** s = 1 ps	$\frac{1\,\mathbf{ps}}{1\times10^{-12}\ \mathbf{s}}$ or $\frac{1\times10^{-12}\ \mathbf{s}}{1\,\mathbf{ps}}$

Each of these have negative exponents because each prefix is smaller than the base unit (decreasing orders of magnitude). Remember, the power of 10 is always written with the base unit whether it is on the top or the bottom of the ratio. The ratios can be "flipped" so that the appropriate unit is on the bottom of the ratio.

Can also be found on page 43 of your book

You are not responsible for many of the base units used in the above examples, but incase you are curious here they are:

fl = flop, computation per second; B = byte, information storage; Ω = ohm, electrical resistance; **J = Joule, energy**; **L = liter, volume**; Pa = Pascal, pressure; A = ampere, electrical current; **g = gram, mass**; **m = meter, length**; **s = second, time**

Any of these prefixes can be applied to any of these (and many many more) base units