EDEXCEL KEY CONCEPTS OF PHYSICS

SI Units for physical quantities

SI units are used all round the World.

Common names

Physical quantity	*Unit*
Mass	*Kilogram (Kg)*
Length	*Metre (m)*
Volume	*Metre cubed (m^3)*
Time	*Second (s)*
Current	*Ampere (A)*
Temperature	*Kelvin (K)*

Derived units with special names

Physical quantity	*Unit and abbreviation*
Energy	*Joule (J)*
Frequency	*Hertz (Hz)*
Force	*Newton (N)*
Power	*Watt (W)*
Pressure	*Pascal (Pa)*
Electric charge	*Coulomb (C)*
Electric potential difference	*Volt (v)*
Electric resistance	*Ohm (Ω)*
Magnetic flux density	*Tesla (T)*

Multiples and sub-multiples of units

SI base units with prefixes in front of them.

Prefix tells you how much bigger or smaller a unit is than the base unit

e.g. kilogram is one thousand grams.

Scaling prefixes — *Used for large or small quantities* — Makes the size of the number more manageable.

Prefix	*Symbol*	Multiple of Unit	Standard form
terra	T	1,000,000,000,000	10^{12}
giga	G	1,000,000,000	10^{9}
mega	M	1,000,000	10^{6}
kilo	k	1000	10^{3}
deci	d	0.1	10^{-1}
centi	c	0.01	10^{-2}
milli	m	0.001	10^{-3}
micro	μ	0.000001	10^{-6}
nano	n	0.000000001	10^{-9}

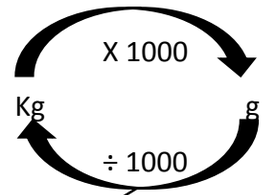
Standard form

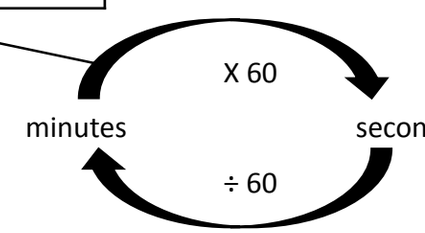
Number	Standard form
1000	1×10^{3}
1,000,000	1×10^{6}
0.00001	1×10^{-5}

Standard form — *An easy way to write very large or very small numbers*

Conversion between units

From a smaller unit to a bigger unit	*Divide by the conversion factor*
From a bigger unit to a smaller unit	*Multiply by the conversion factor*





Significant figures

Significant figures (s.f.)	
	Sometimes we do not need to give detailed answers to problems - we just want a rough idea. A long number, could be rounded off to the nearest thousand, or nearest million.
	Another method of giving an approximated answer is to round off using significant figures.

The first significant figure of a number is the first digit that is not a zero.

The second and third significant figures come straight after the first, even if they are zeros.

e.g. 0.33566 to 2 s.f. = 0.34 (2 s.f.)

Remember to write down how many significant figures you have rounded your answer to.

Remember in any calculation you should round down to the lowest number of significant figures given.

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Common names

Physical quantity	Unit and abbreviation
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	Newton (N)
	Watt (W)
	Pascal (Pa)
	Coulomb (C)
	Volt (v)
	Ohm (Ω)
	Tesla (T)

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	An easy way to write very large or very small numbers

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	Multiply by the conversion factor

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nano			

Standard form

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1,000,000	
0.00001	

Standard form

Conversion between units

From a smaller unit to a bigger unit	
From a bigger unit to a smaller unit	

X 1000 (Kg → g)

÷ 1000

X 60 (minutes → seconds)

÷ 60

Significant figures

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SI units

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Physical quantity	*Unit*

Common names

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Derived units with special names

Multiples and sub-multiples of units

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Standard form

Number	Standard form
	1×10^3
1,000,000	
0.00001	

Conversion between units

X 1000
Kg g
÷ 1000

X 60
minutes secon
÷ 60

Significant figures

The first significant figure

The second and third significant figures

e.g. 0.33566 to 2 s.f. = 0.34 (2 s.f.)

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