Chapter 1: Introduction.

What is Physics?

Physics is the branch of science that studies matter, energy and the relationship between them.

Studying Physics in this Class!

- try to think logically
- ask questions and continue until you understand the topic
- think like a scientist by being curious (if you have a question that's not related, look it up on the internet)
- when doing experiments, spend time and work as a team. Take pride in your work and try to get the correct answer.

Areas We'll Cover.

- Light and Optics
- Mechanics and Motion
- Heat
- Waves and Sound
- Electricity and Magnetism
- Atomic Physics and Electronics
- Nuclear and Particle Physics.

Experiments in Physics

Observation.

Here you only observe something happening.
e.g., in junior cert you observed that metals expand when heated or that an electric circuit must be closed for a current to flow. Here, NO measurements were taken.

Measurement.

Here, a measurement is taken.
e.g., in junior cert, measurements were taken during the Hooke's law experiment.

Physical Quantity

Any property of matter that can be measured is called a physical quantity.

e.g., time, length, area, volume, current, force, energy, power, resistance and many more.

What is Measuring?

When you measure a quantity, you compare it with the standard amount of the same quantity. This standard amount is called a unit.

SI Units

This is the international system of units. Set up in 1960, it is used throughout physics.
e.g. Include second, metre, newton, ohm

Basic Units

There are 7 units called basic units. They are defined units so we can relate others to them easily.
They are metre, second, kilogram, kelvin, ampere, (mole and candela)

Derived Units

Every other unit of a quantity is called a derived unit. They can be expressed as a product or quotient of one or more of the basic units.
e.g. Include m^2, m^3, $m\ s^{-1}$, $kg\ m^{-3}$

Sometimes when a unit is expressed in basic units, it can become complicated so it is often given another name. (usually the scientist that discovered it)

When this happens, the unit symbol is written with a capital letter but the name of the unit is not.

See page 4.

Using SI units

- make sure the units are all expressed in the correct SI units
- only write the unit in the final line of the answer.
- always leave a space between the number and the unit.
- also leave a space between the symbol of each basic unit e.g. m s^{-1}

Scientific notation and Prefixes.

Sometimes the standard SI unit is too large or small to be used. Scientific notation or prefixes are used in this situation.

- 20 kilometres = 20 km (note there is no space between the k and m)
- only multiples of 10^3 are usually used. (see page 5)