Physics – Year 10 Overview

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6	Careers
Year 10	**Energy**	**Electricity & Magnetism (1)**		**Matter**	**Atomic Physics**	**Forces (1)**	
	There are changes in the way energy is stored when a system changes. These energy changes can be calculated using the following as examples: $E_k = ½ m v^2$ $E_e = ½ k e^2$ $E_p = m g h$ The amount of energy stored in or released from a system as its temperature changes can be calculated using: $\Delta E = m c \Delta\Theta$ 'Power' is the rate at which energy is transferred or the rate at which work is done. Energy can be transferred usefully, stored or dissipated, but cannot be created or	The size of an electrical current is the rate of flow of electrical charge. Current, resistance or potential difference can be calculated using: $V = I R$ For some resistors, the resistance remains constant but in others it changes as the temperature changes. There are known differences between current and potential difference in series and parallel circuits. Electrical power can be transferred from power stations to consumers using the National Grid. Power can be calculated using: $P = I V$ $P = I^2 R$	Electrical appliances are designed to bring about an energy transfer; the size of which depends on how long the appliance is switched on for and the power of the appliance. ***SEPARATE SCIENCE:*** When two electrically charged objects are brought close together, they exert a force on each other. A charged object creates an electric field around itself. The electric field is strongest close to the charged object. **Matter** The particle model can be used to explain differences in density. It can also be used to describe changes in state. Heating either changes the temperature of a system or produces a change of state. If the temperature of the system increases, the increase in temperature depends on the mass of the substance heated,	The energy needed for a substance to change state is called latent heat. The molecules of a gas are in constant random motion. The temperature of the gas is related to the average kinetic energy of the molecules. ***SEPARATE SCIENCE:*** A gas can be compressed or expanded by pressure changes. The pressure produces a net force at right angles to the wall of the gas container (or any surface).	(Knowledge of the structure of the atom and the development of the model of the atom is common content with Chemistry). Some atomic nuclei are unstable. The nucleus gives out radiation as it changes to become more stable, including: • Alpha particles. • Beta particles. • Gamma rays. • Neutrons. Nuclear equations are used to represent radioactive decay. Different radioactive isotopes have different half lives and decay at different rates. Radioactive contamination presents hazards in the form of decaying atoms.	Scalar quantities have magnitude only. Vector quantities have magnitude and an associated direction. A force is a push or pull that acts on an object due to the interaction with another object. All forces between objects are either: • Contact forces. • Non-contact forces. Weight is the force acting on an object due to gravity and can be calculated using: $W = m g$ A number of forces acting on an object may be replaced by a single force that has the same effect as all the original forces acting together. This single force is called the resultant force. When a force causes an object to move through	**Term 1: A career as an energy assessor.** When studying energy and how energy resources can be renewable or non-renewable, students will look at how an energy assessor will assess how to make buildings more energy efficient.

	destroyed. Efficiency is a measure of how much energy is transferred usefully. Energy resources from the Earth can be renewable or non-renewable; the environmental issues of such use must also be considered.		the type of material and the energy input to the system.		***SEPARATE SCIENCE:*** Background radiation comes from natural and man-made sources such as rocks, cosmic rays and nuclear weapons. Nuclear fission is the splitting of a large and unstable nucleus. Nuclear fusion is the joining of two light nuclei to form a heavier nucleus.	a distance work is done on the object. ***SEPARATE SCIENCE:*** A force or a system of forces may cause an object to rotate. The pressure at the surface of a fluid can be calculated using the equation: $P = F / A$	