KS3 curriculum map – Science Year 7

Timing	**Topic**	**Key concept – what do I want the students to learn from this unit?**	**What knowledge will they acquire?**
	YEAR 7 OVERVIEW		
Classes will be taught in different orders	**Forces** Speed and Gravity	If the overall, resultant force on an object is non-zero, its motion changes and it slows down, speeds up or changes direction.	A force is a push or pull. Unit of force is the Newton. Resultant force. Equilibrium. Speed. Relative Motion. Distance-Time graphs. Gravity, mass and weight.
	Energy Energy costs Energy transfer	We can describe how jobs get done using an energy model where energy is transferred from one store at the start to another at the end. When energy is transferred, the total is conserved, but some energy is dissipated, reducing the useful energy.	Food and fuels. Energy resources. Energy and power. Energy stores and conservation of energy. Energy dissipation.
	Waves Sound and light	Sound consists of vibrations which travel as a longitudinal wave through substances. The denser the medium, the faster sound travels.	Speed of sound in air. Loudness and amplitude. Frequency and pitch. Function of parts of the ear.

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		The greater the amplitude of the waveform, the louder the sound. The greater the frequency (and therefore the shorter the wavelength), the higher the pitch. When a light ray meets a different medium, some of it is absorbed and some reflected. For a mirror, the angle of incidence equals the angle of reflection. The ray model can describe the formation of an image in a mirror and how objects appear different colours. When light enters a denser medium it bends towards the normal; when it enters a less dense medium it bends away from the normal. Refraction through lenses and prisms can be described using a ray diagram as a model.	Speed of light. The law of reflection. The law of refraction. The structure and function of the eye. Colour and frequency.
	Matter Particle model and separating mixtures	Properties of solids, liquids and gases can be described in terms of particles in motion but	The particle model States of matter. Melting and freezing. Boiling.

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		with differences in the arrangement and movement of these same particles: closely spaced and vibrating (solid), in random motion but in contact (liquid), or in random motion and widely spaced (gas). A pure substance consists of only one type of element or compound and has a fixed melting and boiling point. Mixtures may be separated due to differences in their physical properties.	Evaporation and condensation. Diffusion. Gas pressure. Elements, compounds and mixtures as particles. Pure substances and mixtures. Melting curve. Solutions. Solubility. Filtration. Evaporation and distillation. Chromatography.
	Reactions Acids and Alkalis Metals and non-metals	The pH of a solution depends on the strength of the acid: strong acids have lower pH values than weak acids. Mixing an acid and alkali produces a chemical reaction, neutralisation, forming a chemical called a salt and water. Describe an oxidation, displacement, or metal - acid reaction with a word equation.	Evidence for chemical reactions. Acids and Alkalis, associated hazards and concentration. Indicators and the pH scale. Strong and weak acids. Neutralisation. Bases and salts. Making salts.

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		Use particle diagrams to represent oxidation, displacement and metal-acid reactions. Identify an unknown element from its physical and chemical properties. Place an unfamiliar metal into the reactivity series based on information about its reactions.	Metals, non-metals and their physical properties. Chemical reactions of metals and non-metals. Reaction of metals with acids, oxygen and water. Metal displacement reactions.
	Organisms Movement Cells	The parts of the human skeleton work as a system for support, protection, movement and the production of new blood cells. Antagonistic pairs of muscles create movement when one contracts and the other relaxes. Multicellular organisms are composed of cells which are organised into tissues, organs and systems to carry out life processes. There are many types of cell. Each has a different structure or feature so it can do a specific job.	Organ Systems. Function of the skeleton. Joints and movement. Muscles and movement. Plant and animal cells. Specialised cells Diffusion. Uni and multi-cellular organisms.

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	Ecosystems Interdependence and plant reproduction.	Organisms in a food web (decomposers, producers and consumers) depend on each other for nutrients. So, a change in one population leads to changes in others. The population of a species is affected by the number of its predators and prey, disease, pollution and competition between individuals for limited resources such as water and nutrients. Plants have adaptations to disperse seeds using wind, water or animals. Plants reproduce sexually to produce seeds, which are formed following fertilisation in the ovary.	Food chains and webs. Factors that affect the population of a species. Ecosystems and competition.
	Genes Variation and Human Reproduction	There is variation between individuals of the same species. Some variation is inherited, some is caused by the environment and some is a combination. Variation between individuals is important for the survival of a species, helping it to avoid	The structure of a flower and pollination. Fertilisation and germination. Methods of seed dispersal. Variation and its causes. Continuous and discontinuous variation. Variation and adaptation to change.

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		extinction in an always changing environment. The menstrual cycle prepares the female for pregnancy and stops if the egg is fertilised by a sperm. The developing foetus relies on the mother to provide it with oxygen and nutrients, to remove waste and protect it against harmful substances.	Adolescence. Male and female reproductive systems. Fertilisation and implantation. Gestation, development of the foetus. The menstrual cycle.