KS3 curriculum map

| Timing | **Topic** | **Key concept – what do I want the students to learn from this unit?** | **What knowledge will they acquire?** |
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| **YEAR 7 OVERVIEW** | | | |
| **Year 7 are on a rotation so they will cover all of these topics but different classes will complete them in a different order.** | **Forces**  Speed and Gravity  **Electromagnets**  Voltage and resistance  Currents  **Energy**  Energy costs  Energy transfer  **Waves**  Sound and light  **Matter**  Particle model and separating mixtures  **Reactions**  Acids and Alkalis  Metals and non-metals  **Earth**  Earth Structure and  The Universe  **Organisms**  Movement  Cells  **Ecosystems**  Interdependence and plant reproduction.  **Genes**  Variation and Human Reproduction | If the overall, resultant force on an object is non-zero, its motion changes and it slows down, speeds up or changes direction.  We can model voltage as an electrical push from the battery, or the amount of energy per unit of charge transferred through the electrical pathway.  In a series circuit, voltage is shared between each component. In a parallel circuit, voltage is the same across each loop.  Components with resistance reduce the current flowing and shift energy to the surroundings.  Current is a movement of electrons and is the same everywhere in a series circuit. Current divides between loops in a parallel circuit, combines when loops meet, lights up bulbs and makes components work.  Around a charged object, the electric field affects other charged objects, causing them to be attracted or repelled. The field strength decreases with distance.  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.  Sound consists of vibrations which travel as a longitudinal wave through substances. The denser the medium, the faster sound travels.  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.  Properties of solids, liquids and gases can be described in terms of particles in motion but 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.  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 metalacid reaction with a word equation.  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.  Sedimentary, igneous and metamorphic rocks can be inter converted over millions of years through weathering and erosion, heat and pressure, and melting and cooling.  The solar system can be modelled as planets rotating on tilted axes while orbiting the Sun, moons orbiting planets and sunlight spreading out and being reflected. This explains day and year length, seasons and the visibility of objects from Earth.  Our solar system is a tiny part of a galaxy, one of many billions in the Universe. Light takes minutes to reach Earth from the Sun, four years from our nearest star and billions of years from other galaxies.  Name the current model of the Solar System.  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.  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.  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 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. | 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.  Potential difference.  Resistance.  Series and parallel circuits.  Current.  Electric field.  Food and fuels.  Energy resources.  Energy and power.  Energy stores and conservation of energy.  Energy dissipation.  Speed of sound in air.  Loudness and amplitude.  Frequency and pitch.  Function of parts of the ear.  Speed of light.  The law of reflection.  The law of refraction.  The structure and function of the eye.  Colour and frequency.  The particle model  States of matter.  Melting and freezing.  Boiling.  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.  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.  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.  The structure of the Earth.  Sedimentary rock examples and formation.  Igneous rock examples and formation.  The rock cycle.  Ceramic materials.  The scale of the Universe.  The solar system.  The Earth’s day, night and seasons.  The phases of the moon.  Organ Systems.  Function of the skeleton.  Joints and movement.  Muscles and movement.  Plant and animal cells.  Specialised cells  Diffusion.  Uni and multi-cellular organisms.  Food chains and webs.  Factors that affect the population of a species.  Ecosystems and competition.  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.  Adolescence.  Male and female reproductive systems.  Fertilisation and implantation.  Gestation, development of the foetus.  The menstrual cycle. |