HAPS – KS3 Science Long Term Plan

Harpurhey Alternative Provision School

Created: February 2023

Adapted from CO-OP North Manchester's Curriculum

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic(s)	Nutrition and Enzymes Reactivity	Sound and Light Breathing and Respiration	Materials	Electricity Genes	Earth	Motion Climate Change
Knowledge	The body needs a balanced diet with carbohydrates, lipids, proteins, vitamins, minerals, dietary fibre and water, for its cells' energy, growth and maintenance. Organs of the digestive system are adapted to break large food molecules into small ones which can travel in the blood to cells and are used for life processes Metals and non-metals react with oxygen to form oxides which are either bases or acids. Metals can be arranged as a reactivity series in order of how readily they react with other substances. Some	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 a way from the normal. Refraction through lenses and prisms can be described using a ray diagram as a model. In gas exchange, oxygen and	The elements in a group all react in a similar way and sometimes show a pattern in reactivity. As you go down a group and across a period the elements show patterns in physical properties.	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	Sedimentary, igneous and metamorphic rocks can be inter converted over millions of years through weathering and erosion, heat and pressure, and melting and cooling. Electricity is generated by a combination of resources which each have advantages and disadvantages.	If the overall, resultant force on an object is non-zero, its motion changes and it slows down, speeds up or changes direction. Carbon is recycled through natural processes in the atmosphere, ecosystems, oceans and the Earth's crust (such as photosynthesis and respiration) as well as human activities (burning fuels). Greenhouse gases reduce the amount of energy lost from the Earth through radiation and therefore the temperature has been rising as the concentration of those gases has risen.

	metals react with acids to produce salts and hydrogen.	carbon dioxide move between alveoli and the blood. Oxygen is transported to cells for aerobic respiration and carbon dioxide, a waste product of respiration, is removed from the body. Breathing occurs through the action of muscles in the ribcage and diaphragm. The amount of oxygen required by body cells determines the rate of breathing. Respiration is a series of chemical reactions, in cells, that breaks down glucose to provide energy and form new molecules. Most living things use aerobic respiration but switch to anaerobic respiration, which provides less energy, when oxygen is unavailable.		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. 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.		Scientists have evidence that global warming caused by human activity is causing changes in climate.
Understanding: Concepts / Disciplinary Knowledge	Explain how diet and nutrition is linked to health. Describe the process of digestion and	Describe different types of waves. Explain how light and sound travel through different media.	Explain how the chemical composition of a material is related to its properties.	Identify circuit components. Investigate current, p.d and resistance.	Describe the different stages of the rock cycle and discuss the features of sedimentary, igneous	Calculate speed and acceleration. Describe relative speed.

	explain adaptations of the digestive system. Describe the role and importance of enzymes in digestion. Explain how different substances have a predisposition to react and predict reactions between substances. Represent chemical reactions using word and symbol equations	Describe the mechanical process of breathing. Explain the need of respiration for all organisms. Know the difference between aerobic and anaerobic respiration	Explain how the structure of materials is related to its properties. Explain how properties are related to the usefulness of a material.	Explain how charged objects can attract and repel. Describe variation qualitatively and quantitatively. Explain how characteristics are inherited. Explain how species change over time due to evolution by natural selection.	and metamorphic rock. Discuss the use of renewable and non-renewable resources in terms of their usefulness and environmental impact	Interpret distance/time, speed/time graphs. Explain how changes in the Earth's atmosphere are affecting climate around the world. Evaluate the impact that humans and their activities are having on the Earth's climate.
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Teacher Notes						