**Science – Overview of KS3 Curriculum Topics - YEAR 8**

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| **Term** | **Yr 8 Key Performance Indicators** |
| **Autumn 1 Forces and Electromagnets** | **Contact Forces** - Investigate factors that affect the size of frictional or drag forces |
| Explain whether an object in an unfamiliar situation is in equilibrium. |
| Describe factors which affect the size of frictional and drag forces. |
| Describe how materials behave as they are stretched or squashed. |
| Describe what happens to the length of a spring when the force on it changes. |
| **Pressure** - Investigate how pressure from your foot onto the ground varies with different footwear. |
| Use diagrams to explain observations of fluids in terms of unequal pressure. |
| Explain why objects either sink or float depending upon their weight and the upthrust acting on them. |
| Explain observations where the effects of forces are different because of differences in the area over which they apply. |
| Given unfamiliar situations, use the formula to calculate fluid pressure or stress on a surface. |
| **Electromagnets** - Investigate ways of varying the strength of an electromagnet. |
| Use a diagram to explain how an electromagnet can be made and how to change its strength. |
| Explain the choice of electromagnets or permanent magnets for a device in terms of their properties. |
| **Magnetism** - Explore the magnetic field pattern around different types or combinations of magnets. |
| Use the idea of field lines to show how the direction or strength of the field around a magnet varies. |
| Explain observations about navigation using Earth's magnetic field. |

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| **Autumn 2 Energy and Waves** | **Work** - Explain how an electric motor raising a weight is doing work. |
| Draw a diagram to explain how a lever makes a job easier. |
| Compare the work needed to move objects different distances. |
| **Heating and Cooling** - Investigate how to prevent heat loss by conduction, convection and radiation |
| Explain observations about changing temperature in terms of heat flow. |
| Describe how an object's temperature changes over time when heated or cooled |
| Explain how a method of heat insulation works in terms of conduction, convection and radiation. |
| Sketch diagrams to show convection currents in unfamiliar situations. |
| **Wave Effects** - Relate the impact of different types of waves on living cells to their frequency and the energy carried by the wave. |
| Explain differences in the damage done to living cells by light and other waves, in terms of their frequency. |
| Explain how audio equipment converts sound into a changing pattern of electric current. |
| **Wave Properties** - Use the wave model to explain observations of the reflection, absorption and transmission of waves. |
| Describe the properties of different longitudinal and transverse waves. |
| Use the wave model to explain observations of the reflection, absorption and transmission of a wave. |

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| **Spring 1 Matter and Reactions** | **Periodic Table** - Sort elements using chemical data and relate this to their position in the periodic table. |
| Use data to describe a trend in physical properties. |
| Describe the reaction of an unfamiliar Group 1 or 7 element |
| Use data showing a pattern in physical properties to estimate a missing value for an element. |
| Use observations of a pattern in chemical reactions to predict the behaviour of an element in a group |
| **Elements** - Compare the properties of elements with the properties of a compound formed from them. |
| Name compounds using their chemical formulae |
| Given chemical formulae, name the elements present and their relative proportions |
| Represent atoms, molecules and elements, mixtures and compounds using particle diagrams |
| Use observations from chemical reactions to decide if an unknown substance is an element or a compound |
| **Chemical Energy** - Investigate a phenomenon that relies on an exothermic or endothermic reaction. |
| Use experimental observations to distinguish exothermic and endothermic reactions |
| Use a diagram of relative energy levels of particles to explain energy changes observed during a change of state |
| **Types of Reaction** - Investigate changes in mass for chemical and physical processes |
| Explain why a reaction is an example of combustion or thermal decomposition |
| Predict the products of the combustion or thermal decomposition of a given reactant and show the reaction as a word equation |
| Explain observations about mass in a chemical or physical change |

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|  | Climate - Investigate the contribution that natural and human chemical processes make to our carbon dioxide emissions |
|  | Use a diagram to show how carbon is recycled in the environment and through living things |
|  | Describe how human activities affect the carbon cycle |
|  | Describe how global warming can impact on climate and local weather patterns |
|  | Earth Resources - Predict the method used for extracting metal based on its position in the reactivity series. |
|  | Explain why recycling of some materials is particularly important |
|  | Describe how Earth's resources are turned into useful materials or recycled |
| **Spring 2**  | Justify the choice of extraction method for a metal, given data about reactivity |
| **Earth and**  | Suggest factors to take into account when deciding whether extraction of a metal is practical |
| **Organisms**  | Breathing - Investigate a claim linking height to lung volume |
|  | Explain how exercise, smoking and asthma affect the gas exchange system |
|  | Explain how the parts of the gas exchange system are adapted to their function |
|  | Explain observations about changes to breathing rate and volume |
|  | Explain how changes in volume and pressure inside the chest move gases in and out of the lungs |
|  | Digestion - Evaluate how well a model represents key features of the digestive system. |
|  | Describe possible health effects of unbalanced diets from data provided |
|  | Calculate food requirements for a healthy diet, using information provided |
|  | Describe how organs and tissues involved in digestion are adapted for their role |
|  | Describe the events that take place in order to turn a meal into simple food molecules inside a cell |

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| **Summer 1 Ecosystem and Genes** | **Respiration** - Use data from investigating fermentation with yeast to explore respiration |
| Use word equations to describe aerobic and anaerobic respiration |
| Explain how specific activities involve aerobic or anaerobic respiration |
| **Photosynthesis** - Use lab tests on variegated leaves to show that chlorophyll is essential for photosynthesis. |
| Describe ways in which plants obtain resources for photosynthesis |
| Explain why other organisms are dependent on photosynthesis |
| Sketch a line graph to show how the rate of photosynthesis is affected by changing conditions |
| Use a word equation to describe photosynthesis in plants and algae |
| **Evolution** - Review the evidence for theories about how a particular species went extinct. |
| Use evidence to explain why a species has become extinct or adapted to changing conditions |
| Evaluate whether evidence for a species changing over time supports natural selection |
| Explain how a lack of biodiversity can affect an ecosystem |
| Describe how preserving biodiversity can provide useful products and services for humans |
| **Inheritance** - Model the inheritance of a specific trait and explore the variation in the offspring produced. |
| Use a diagram to show the relationship between DNA, chromosomes and genes |
| Use a diagram to show how genes are inherited |
| Explain how a change in the DNA (mutation) may affect an organism and its future offspring |
| Explain why offspring from the same parents look similar but are not usually identical |