Year 8 Science Learning Programme

Year 8 Science Topics	By the end of the topic I will be able to.....	I will also be developing my investigative skills
Metals and non-metals	• Describe an oxidation, displacement, or metal acid 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	Use experimental results to suggest an order of reactivity of various metals
Energy costs	• Compare the amounts of energy transferred by different foods and activities. • Compare the energy usage and cost of running different home devices. • Explain the advantages and disadvantages of different energy resources. • Represent the energy transfers from a renewable or non-renewable resource to an electrical device in the home	Compare the running costs of fluorescent and filament light bulbs
Energy transfer	• Describe how the energy of an object depends on its speed, temperature, height or whether it is stretched or compressed. • Show how energy is transferred between energy stores in a range of real-life examples. • Calculate the useful energy and the amount dissipated, given values of input and output energy. • Explain how energy is dissipated in a range of situations	Explain the energy transfers in a hand-crank torch

Variation	• Explain whether characteristics are inherited, environmental or both. • Plot bar charts or line graphs to show discontinuous or continuous variation data. • Explain how variation helps a particular species in a changing environment. • Explain how characteristics of a species are adapted to particular environmental conditions.	Graph data relating to variation and explain how it may lead to the survival of a species
Magnetism	• 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	Explore the magnetic field pattern around different types or combinations of magnets
Electromagnets	• 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.	Investigate ways of varying strength of an electromagnet
Elements	• 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.	Compare the properties of elements with the properties of a compound formed from them

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.	Sort elements using chemical data and relate this to their position in the periodic table
Breathing	• 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	Investigate a claim linking height to lung volume
Digestion	• 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.	Evaluate how well a model represents key features of the digestive system
Respiration	• Use word equations to describe aerobic and anaerobic respiration. Explain how specific activities involve aerobic or anaerobic respiration.	Use data from investigating fermentation with yeast to explore respiration

Contact 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.	Investigate factors that affect the size of frictional or drag forces
Pressure	• 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.	Investigate how pressure from your foot onto the ground varies with different footwear
Earth resources	• Explain why recycling of some materials is particularly important. • Describe how Earth's resources are turned into useful materials or recycled. • Justify the choice of extraction method for a metal, given data about reactivity. • Suggest factors to take into account when deciding whether extraction of a metal is practical.	Predict the method used for extracting a metal based on its position in the reactivity series • Analyse patterns • Draw conclusions • Present data • Communicate • Construct explanations

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.	Use lab tests on variegated leaves to show that chlorophyll is essential for photosynthesis
Climate	• Know how Carbon is recycled in the environment • Interpret the effect of Greenhouse gases on Global Warming • Describe the work of Scientists and the evidence being gathered to show how human activity is causing changes in climate.	Investigate the contribution that natural and human chemical processes make to our carbon dioxide emissions • Communicate ideas • Construct explanations • Justify opinions • Examine consequences • Review theories
Heating and cooling	• Explain observations about changing temperature in terms of energy transfer. • Describe how an object's temperature changes over time when heated or cooled. • Explain how a method of thermal insulation works in terms of conduction, convection and radiation. • Sketch diagrams to show convection currents in unfamiliar situations	Investigate how to prevent heat loss by conduction, convection and radiation

Types of reaction	• 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. • Use particle diagrams to show what happens in a reaction.	Investigate changes in mass for chemical and physical processes
Wave properties	• 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	Use the wave model to explain observations of the reflection, absorption and transmission of waves