St Benedict's Catholic School: Key Stage 3 Grade Descriptors – Science Y9

Assessment Objectives				
Year 9 Expectations	**Biology**	**Chemistry**	**Physics**	**Science investigations**
Mastered	• I can explain how evolution occurs by a process of natural selection and accounts both for biodiversity and how organisms are all related to varying degrees. • I can explain how living organisms may form populations of single species, communities of many species and ecosystems, interacting with each other, with the environment and with humans in many different ways - living organisms are interdependent and show adaptations to their environment. • Can link diffusion with wilting. • I can explain the effects of anaerobic respiration on the body during and after exercise.	• I can apply my knowledge of patterns in chemical reactions to suggest how substances, such as salts, could be made. • I understand the applications of chemical reactions in everyday contexts, such as the extraction of iron in the blast furnace • I can explain the atomic structure of the first twenty elements in the periodic table. • I can explain the differences between chemical reactions which are exothermic and those which are endothermic.	• I can evaluate physical phenomena from different perspectives, such as relating the dissipation of energy during energy transfer to the need to conserve limited energy resources.	• Unaided, I can prepare systematic and precise plans for their investigations, including a strategy for dealing with results. • Unaided, I can prepare systematic and precise plans for their investigations, including a strategy for dealing with results. • I can decide on the observations and measurements that need to be taken and the degree of accuracy that is required. • I can set up and use a range of scientific apparatus with precision and skill.
Extended	• I can explain how living organisms are interdependent and show adaptations to their environment. • I can explain how the characteristics of a living organism are influenced by its genome and its interaction with the environment. • I can describe how the chemicals in ecosystems are continually cycling through the natural world. • Can explain and measure muscle strength. • I can explain bioaccumulation in food chains and some effects of this. • I am able to explain how a leaf is adapted for photosynthesis.	• I can apply my knowledge of particles to explain changes of state and dissolving. • I can describe the effects of corrosive gas pollutants. • I can evaluate the positive and negative effects of the exploitation of raw materials. • I can explain why temperature has a greater effect on rate than surface area and concentration.	• I can apply my knowledge and understanding to a range of contexts including unfamiliar situations. • I can use the principle of moments in practical situations. • I can explain the process of energy transfer by conduction, convection and radiation. • I can describe the relative movement of the Sun and planets within the solar system including the retrograde motion of Mars. • I can plan (with guidance) investigations. Identifying key factors that need to be considered.	• I can decide on the observations and measurements that need to be taken and the degree of accuracy that is required. • I can set up and use a range of scientific apparatus with precision and skill. • I can plan (with guidance) investigations. Identifying key factors that need to be considered. • I can present my data clearly and concisely using graphs with lines of best fit. • I can present my data clearly and concisely using graphs with lines of best fit. • I can produce (unaided) precise plans for my investigations. • I can evaluate my investigations and produce structured reports.

Secure	• I understand that genetic information is carried in the form of chromosomes and genes. • I know the requirements to maintain a healthy body. • I understand the processes of cell respiration and photosynthesis in terms of the main underlying chemical changes. • I can explain the effects of different hormones on plant growth. • I know the word equation for anaerobic respiration. • I can describe the differences between aerobic and anaerobic respiration in animals.	• Can predict the salt formed from a neutralisation reaction. • I can explain the effect of carbon dioxide levels on global temperatures. • I can evaluate evidence of human impact and give balanced views on factors affecting a product's carbon footprint. • I can describe the methods of monitoring water purity.	• Can apply my knowledge and understanding to a range of contexts including unfamiliar situations. • Can produce (unaided) precise plans for my investigations. • Can evaluate my investigations and produce structured reports. • I can explain the process of energy transfer by conduction, convection and radiation. • I understand that global resources are limited and explain why energy should be used efficiently. • I can describe simple applications of electromagnets. • I understand the relationship between applied force, the area over which it acts and the resulting pressure. • I can describe energy conversions in terms of the principle of the conservation of energy • I understand how light is reflected from plane surfaces and that white light can be dispersed to give a range of colours. • I can explain changes in day length, seasonal changes and changes in the elevation of the Sun.	• I can present my data clearly and concisely using graphs with lines of best fit. • I can explain my conclusions using the evidence collected and my knowledge and understanding of science. • I can apply my scientific knowledge from other investigations to plan an investigation.
Approaching	• I know and understand the differences between plant and animal cells. • I understand why food chains and food webs exist in the environment • I understand the circulatory, digestive and respiratory systems in humans and can use appropriate scientific terminology to describe them. • I know that plants need mineral salts. • I can describe how gases enter and leave leaves.	• I can identify common gases. • I can use the pH scale when classifying solutions as acidic, alkaline or neutral. • I can explain rusting in terms of oxidation and know how rusting can be controlled. • I can discuss the positive and negative effects of obtaining and using the raw materials from the Earth. • I am able to relate carbon dioxide levels to global warming and how humans can impact carbon dioxide levels. • I can calculate relative formula mass. • I can relate energy changes to the bond being broken and made. • I can use particle diagrams to explain the effect of temperature, catalysts, surface area and concentration on the rate of a chemical reaction. • Can compare exothermic and endothermic reactions.	• Can compare specular reflection and diffuse scattering. • I understand the relationship between applied force, the area over which it acts and the resulting pressure. • I can distinguish between temperature and thermal energy. • I can describe energy conversions in terms of the principle of the conservation of energy. • I can recall that energy sources are ultimately dependent on the Sun's energy. • I understand the meaning of temperature. • I can identify a variety of energy sources and know the difference between renewable and non-renewable sources • I can explain the relationship between loudness and amplitude, and pitch and frequency of a sound. • I can describe how day, night and year length are caused by the movement of the Earth.	• I can explain my conclusions using the evidence collected and my knowledge and understanding of science • I can use my knowledge to make predictions about what they think will happen. • I can interpret my data and begin to explain these using my scientific knowledge and understanding. • I can draw conclusions and relate it to my knowledge and understanding. • Can make predictions using my scientific knowledge.

Developing	• I can assign organisms to their major groups. • I know the functions of food, the roles of nutrients in the diet and the reasons for maintaining a healthy diet. • I can describe, in simple terms, the parts and basic functions of the major organ systems in humans.	• I can suggest why certain materials are suitable for specific purposes. • I know that products made from paper, glass or aluminium can be recycled. • Can identify reactants and products in word equations. • I can summarise the carbon cycle and how humans may affect this. • I am able to relate recycling to reducing a product's carbon footprint. • I can describe methods to monitor the rate of a chemical reaction.	• Can contrast the speed of sound with speed of light. • Can describe the link between frequency and pitch. • Can explain how images are formed in a mirror. • Can explain what refraction is. • I understand the meaning of temperature. • I can identify a variety of energy sources and know the difference between renewable and non-renewable sources. • I can describe how forces can affect the movement and shape of objects. • I can identify a range of energy sources. • I can carry out a fair test and say which factors need to be kept constant.	• I can design a fair test to answer questions that arise from their work in science. • I can use my knowledge to make predictions about what they think will happen. • I can interpret my data and begin to explain these using my scientific knowledge and understanding. • I can draw conclusions based on the available evidence • I can use a range of apparatus with appropriate precision and safety. • I can interpret my data and begin to explain these using my scientific knowledge and understanding. • I can draw conclusions based on the available evidence
Beginning	• I can classify the animals and plants found in a local habitat using groupings • I can name the major organs of the human body and identify the position of these organs.	• I know that some everyday substances, such as sugar or salt, will dissolve in water. • I know that materials, such as wood, decay naturally while others, such as plastics, do not. • I am able to state that humans can have impact on the Earth and the importance of recycling. • I can describe what happens when some everyday substances are heated or cooled.	• Can state that a wave carries energy. • Can name the two main types of waves. • Can describe how sound waves travel. • I can recall that there are different sources of energy, such as oil, gas or coal. • Can describe transverse and longitudinal waves. • Can explain why speed of sound changes in different materials. • Can describe link between loudness and amplitude. • I can describe how heat transfers from different places. • I know that there are different sources of energy. • I can explain that sounds are produced by vibrations.	• I can suggest how ideas can be investigated and make predictions about what might happen. • I can carry out a fair test and say which factors need to be kept constant. • I can draw conclusions and relate it to my knowledge and understanding. • I can use appropriate instruments to make measurements and know when a test is fair. • I can make a simple record of my observations . • Can interpret my data and begin to explain these using my scientific knowledge.