



Robert Bloomfield Academy: Key Stage 3 Grade Descriptors – Science



KS3	<u>Biology</u>	<u>Chemistry</u>	<u>Physics</u>
Exceeding KS3 Expectations	<p>Explain the need to have these food groups balanced and the named effects on the body when they are not. Explain how some factors can affect the rate of photosynthesis. Can explain how hormones are involved, and effect change on the human body eg puberty, the menstrual cycle and pregnancy. Explain how breeding programmes and intervention can help endangered species inc gene banks. Can explain the function of each part and how it is adapted to its role. Explain how the body can move these gases using changes in pressure relative to atmospheric pressure to explain your answer. Explain how outside influence can affect rates of breathing e.g. exercise and asthma. Explain how skeleton-muscles effect movement on the body and the impact of diet and exercise on their size and structure.</p>	<p>Use the idea of periodicity to illustrate trends in elements.</p>	<p>Explain how different factors can affect the use of non-renewable fuels, eg political, financial, social etc.</p>
Year 9 Sec Year 9 Dev Year 9 Beg	<p>Can link identified features of specialised cells to their function. Explain ways in which we can speed up or slow down rates of diffusion e.g. concentration changes, temp changes, etc. Explain the role of each food group in the human body. Explain the advantages and disadvantages of living alongside other organisms. Explain the effect of changes in populations as a result of different populations of species living in a specific habitat Explain how organisms are adapted to survive these changes. Explain how the environment can cause extinction of a species. Explain the different uses a plant may have for the water</p>	<p>Suggest methods of separating mixtures and purifying them based on the particles that are in them. Explain these chemical and physical changes using the particle model. Analyse data on fuels and explain endothermic and exothermic reactions. Explain why the properties of different materials can be different at room temperature, using the particle model. Explain why masses of materials may go up or down during chemical reactions. Explain the relationship between particle energy and state of matter. Group elements explaining the characteristics used for doing so. Explain what is happening in some reactions using a particle model. Express</p>	<p>Explain how different factors can affect the use of renewable resources, eg political, financial, social etc. Explain what happens to an elastic material if you go beyond its elastic limit. Explain terminal velocity using forces and acceleration. Explain strength of magnets using field lines. Explain the uses of electromagnets in some common examples. Relate pressure exerted to density of an object using particle theory.</p>

	<p>and minerals it absorbs. Explain where photosynthesis occurs in plants and how they are adapted to be effective at this process. Explain how the body is adapted to move gases in and out of our bodies during breathing. Explain how the body's response helps it deal with increased rates of exercise and keeps body functions working effectively e.g. heart rate, breathing rate and thermoregulation. Explain, with examples, the different roles of 3 types of muscle.</p>	<p>reactions of compounds using word/symbol equations. Use balanced symbol equations to show what happens to materials during chemical reactions. Explain the relationship between intermolecular forces, energy and particle theories for different materials. Make some predictions about displacement reactions. Make some predictions as to the effect of a changed reaction with metals eg hot and cold water, weak or strong acids. Explain what is happening in these reactions using symbol equations. Use the reactivity series to explain why some metals can be obtained using carbon, and others cannot including reference to the Blast process.</p>	
Year 8 Sec	<p>Explain photosynthesis as a word equation. Explain how a leaf is adapted for photosynthesis. Explain some adaptations of the roots. Can explain how humans are adapted in order to carry out sexual reproduction. Can explain the advantages and disadvantages of sexual and asexual reproduction. Explain how information is stored and passed to offspring. Describe what happens when there are low numbers of a species left. Explain the genetic problems of low population numbers of a species. Can describe how we can show air moving in and out of our bodies. Can explain how respiration takes place inside cells and mitochondria. Explain these processes using information related to both cell ultrastructure and use of word equations. Explain why the body responds to exercise. Describe the role of muscles.</p>	<p>Explain combustion using word and symbol equations. Explain why pH may not always become neutral even when acids and alkalis are added together using particle model. Explain how acids and alkalis may neutralise each other, and the products of doing so. Explain these reactions using balanced symbol equations</p>	<p>Explain how it is possible to make a magnet. State what a field is. Describe how to make an electromagnet and why it is useful. Use a model to explain the effect of changing p.d., current and resistance on components in a circuit. Explain how we see colour. Use the particle model to explain how sound travels. Use the particle model to explain volume and pitch and how this is related to energy. Explain how to detect and/or change the sound that is made. Explain how different animals can detect different auditory ranges. Explain a turning force mathematically. Use maths to calculate the pressure exerted by a solid. Describe some effects of pressure in liquids with real life examples. Explain why certain materials block magnetism whilst others do not. Explain what happens to the metal atoms when you make a magnet. Describe simple experiments to illustrate magnetic fields and demonstrate interactions between poles using field lines. Explain how the</p>

			<p>strength of an electromagnet can be varied. Explain how changing, current, voltage and resistance can have an effect on the components. Explain the effect of the flow of current on electrical components in a circuit. Explain the effect of the flow of current on electrical components in a circuit. Explain the effect of changing resistance and voltage on series and parallel circuits. Use a model to explain how changes in resistance and potential difference can affect the components in a circuit. Explain static electricity using the idea of an electric field Explain how size of charge can affect the force between objects that are oppositely charged. Use practical evidence to calculate refractive indices for different materials. Explain how light is reflected or absorbed. Explain how to balance turning forces using the principle of moments. Relate pressure exerted to density of an object using particle theory. Use maths to calculate the pressure in liquids and gases.</p>
Year 8 Dev	<p>Explain how a plant may use the sugar it produces. State how to test a leaf for starch and explain the purpose of each step. Describe how a plant absorbs water and minerals. Describe the similarities and differences between respiration and photosynthesis. Can describe the some parts of the circulatory system Can describe the all parts of the circulatory system. Describe how humans breathe Explain how the body is adapted to improve gas exchange during breathing. Describe how anaerobic respiration occurs. Describe how anaerobic respiration occurs. Describe the short</p>	<p>Explain why some of these metals may react differently using information from the periodic table. Use these observations to order reactions of metals based on reactivity. Explain what is happening in these reactions using word equations. Explain how carbon can be used to make pure metals from their metal ores. Explain that different indicators can be used to identify the strengths or acids or alkalis. Explain that different acids and alkalis can have different strengths and use the pH scale to show this Explain these reactions using word equations.</p>	<p>Describe some uses of magnets. Describe the rules for attracting and repelling. Describe what a turning force is. Describe some effects of pressure in solids with real life examples.</p>

	and long term effect of exercise on the human body		
Year 8 Beg	Describe what a plant needs to photosynthesise. Describe where starch is made in the plant. Can describe the life cycles of humans. Can describe differences between sexual and asexual reproduction. State the equation for aerobic respiration. State the equation for anaerobic respiration.	Describe some chemical reactions of metals. Describe some chemical reactions of metals. Describe some reactions of metals, metal oxides and metal carbonates with water and acid and displacement reactions. Describe some similarities and differences in the physical and chemical properties of carbon and other metals. Describe how to produce an indicator. Describe how we can detect acids or alkalis using different means. Describe some reaction of metals and non-metals with acids.	State which materials are magnetic/non-magnetic. Describe some simple series and parallel circuits. Describe how to use an ammeter. Describe what voltage and resistance are in a circuit. Describe some ways that you can separate charge between two materials. Explain that light continues to travel in straight lines even during reflection and refraction. Describe white lights as a spectrum. Describe the similarities and difference between light and sound. Describe some ways that you can make sounds
Year 7 Sec	Explain the advantages and disadvantages of organisms moving from unicellular to simple multi-cellular to complex multi-cellular and the adaptations that are needed to survive. Can explain the role of these cell components. Describe food in terms of food groups and identify them through chemical tests. Explain the process of digestion using a model and effect of enzymes. Explain how organisms are adapted to survive these changes. Explain how these changes can leave some species less well adapted to their environment.	Can describe and name 10-20 elements. Predict the names of a compound formed based on the elements reacting. Describe some reactions of compounds. Explain isotopes and why some atoms decay. With examples, explain how you can see differences between chemical and physical changes. Use word equations to show what happens to materials during chemical reactions.	Can explain that energy is transferred rather than used up. Can explain the relationship between size of the force and the effect it has on the object. Describe the effect of changing the force applied to an elastic material on its length. Use simple line graphs to relate speed time and distance. Describe how changing the force acting on an object can change its speed. Explain the relationship between force applied to an object and its acceleration. Explain weightlessness does not mean a change in mass and how weight can be different depending on gravity.
Year 7 Dev	Explain how this structure allows different organisms to carry out their role. Can describe differences between plant and animal cells. Can explain how some cells are different to others. Describe how materials spread out in liquids and gases. Explain diffusion using the particle model. Describe the organs in the digestive system. Explain the adaptations and functions of these organs that allow it to digest	Use particle theory to describe materials. Explain these particles in terms of atoms. Explain why certain elements react with other and the compounds that are formed. Explain mixtures and purity using particle theory. Explain why they have certain types of chemistry based on electrons in outside shells. Describe some simple chemical and physical changes. Describe how materials are made up of atoms and elements in	Can explain different types of energy, incl. fuels and food, using appropriate units. Explain how work is done using laws of thermodynamics. Describe and explain the how we generate and transfer electricity. Explain different viewpoints a range of people might have about the use of non-renewable fuels. Explain how to represent these forces using diagrams. Explain how

	<p>food. Describe some ways in which organisms can live together. Describe how seasonal changes affect organisms in name habitats</p> <p>Describe how some environments changes over periods of time eg ice age and global warming</p>	<p>compounds and mixtures. Describe some chemicals that can be used as fuels. Explain how the particles are behaving in these states of matter. Explain what is happening to the particles as you increase or decrease the energy you have given them. Explain, using the particle model, why there are no mass changes during physical changes. Explain what is happening to the particles as you increase or decrease the energy you have given them. Calculate density of materials from practical data. Use the particle model to explain density of materials</p>	<p>to resolve some simple forces acting on an object. Explain the effect of contact forces on an object. Explain ways that resistance can be changed in order to affect the speed of an object. Explain resistance using particles. Use the principle of gravity to explain the relationship between mass and weight on earth.</p>
Year 7 Beg	<p>Describe the differences between cells, tissues, organs and organ systems.</p> <p>Can identify the parts of a cell.</p> <p>Can describe the basic features of cells.</p>	<p>Explain an atom as the sum of its parts. Use the term compound and molecule correctly and describe how they are formed. Describe some simple methods of separating mixtures. Describe some differences between atoms based on their structure. Describe the properties of solids liquids and gases. Describe how water can change to and from solid, liquid and gas</p> <p>Describe ways that materials can be changed from solids to liquids to gases and back again</p> <p>Describe how water particles move in solid, liquid and gas. Describe some properties of solids.</p>	<p>Can describe sources of different types of energy eg fuels, food. Can identify energy changes in systems. Can explain systems using the idea of efficiency. Calculate running costs of machines over different time ranges. Describe how we harness forms of renewable energy. Describe some forces that act on an object. Describe how to measure forces using a force meter. Describe different types of forces that might act on an object. Explain how size of force applied to an object can affect its length. Use a line graph to explain acceleration. Describe the effect of resistance on the motion of an object. Use a forcemeter to measure the weight of an object.</p>
T1	<p>Can independently identify and name the key features of different cells or organ systems & life processes or predict what might happen in a given situation or experiment.</p>	<p>T1 Can independently identify and name the key features of different materials and their physical and chemical properties or predict what might happen in a given situation or experiment.</p>	<p>Can independently identify and name the key features of types of energy and how to manipulate them or predict what might happen in a given situation or experiment.</p>
T2	<p>Can usually independently identify and name the key features of different cells or organ systems & life processes or predict</p>	<p>Can usually independently identify and name the key features of different materials and their physical and chemical properties or</p>	<p>Can usually independently identify and name the key features of different types of energy and how to manipulate</p>

	what might happen in a given situation or experiment with little assistance	predict what might happen in a given situation or experiment with little assistance	them or predict what might happen in a given situation or experiment with little assistance
T3	Can sometimes independently identify and name the key features of different cells or organ systems & life processes or predict what might happen in a given situation or experiment, but usually needs assistance to do so.	Can sometimes independently identify and name the key features of different materials and their physical and chemical properties or predict what might happen in a given situation or experiment, but usually needs assistance to do so.	Can sometimes independently identify and name the key features of different types of energy and how to manipulate them or predict what might happen in a given situation or experiment, but usually needs assistance to do so.
T4	Can only identify and /or name the key features of different cells or organ systems & life processes or predict what might happen in a given situation or experiment with significant assistance	Can only identify and /or name the key features of different materials and their physical and chemical properties or predict what might happen in a given situation or experiment with significant assistance	Can only identify and /or name the key features of different types of energy and how to manipulate them or predict what might happen in a given situation or experiment with significant assistance