

KS3 Curriculum Overview - Science

Year 8	Autumn 1 (7 weeks)	Autumn 2 (7 weeks)	Spring 1 (5 weeks)	Spring 2 (5 weeks)	Summer 1 (5 weeks)	Summer 2 (7 weeks)
Topic	Food and digestion	Respiration	Microbes and disease	Periodic Table Atoms and elements	Compounds and mixtures	Ecological relationships
Assessment	<p>Y8 B2.1 Health and lifestyle Mastery Tasks Part 1</p> <p><i>In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.</i></p> <p>Explain in detail how you would test a gingerbread-biscuit solution for the presence of starch, sugar, and protein. (6)</p> <p>Part 2 Mastery Task Developing</p> <ul style="list-style-type: none"> • Correctly use the term: diet. • Recall why we need food (energy, growth and repair, health). • State what is shown on food labelling. 	<p>Mastery Task</p> <ul style="list-style-type: none"> • Describe how gases are carried around the body (in the blood). • Describe what happens when muscles contract and relax. <p>Securing</p> <ul style="list-style-type: none"> • Use a model to explain how lungs expand and contract. • Identify muscles cells as being adapted to their function. <p>Exceeding</p> <p>Explain how muscle cells are adapted to their function</p>	<p>Mastery Task</p> <ul style="list-style-type: none"> • Use a statement key to identify different species of bacteria. • Describe, identify and state the basic functions of the parts of a bacterial cell (soft cell wall, flagella, cytoplasm, cell membrane, chromosome). <p>Securing</p> <ul style="list-style-type: none"> • Explain why bacteria grow well in certain conditions. • Describe how bacteria multiply by binary fission. <p>Exceeding</p>	<p>Mastery Tasks Periodic Table</p> <p><i>In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.</i></p> <p>Compare the properties of metals and non-metals. (6)</p> <p>Part 2. Mastery Tasks Developing</p> <ul style="list-style-type: none"> • Describe some common properties of metals and non-metals. • Relate the uses of different elements to their properties. • Recall some reactions that happen slowly and some that happen quickly. 	<p>Mastery Tasks Developing</p> <ul style="list-style-type: none"> • Recall the three states of matter and identify solids, liquids, gases. • State the meaning of: mixture. • State the meaning of: sieving, filtering, insoluble, suspension. • Describe what the three states of matter are like. • Identify mixtures. • Describe how insoluble solids can be separated from a liquid. <p>Securing</p> <ul style="list-style-type: none"> • Group materials using their states of matter as justification. 	<p>Mastery Tasks Developing</p> <ul style="list-style-type: none"> • Use food chains to create food webs and identify food chains within food webs. • Use a food web to identify food sources for different animals and give reasons for identifying organisms as: carnivores, consumers, herbivores, omnivores, predators, prey, producers. • State the resources that organisms need from their habitats and ecosystems. <p>Securing</p>

	<ul style="list-style-type: none"> Recall the names of the nutrients in food. Interpret nutrition information labels. Use nutrition information labels to perform calculations. <p>Securing</p> <ul style="list-style-type: none"> Describe the uses of fibre and water by the body. Describe tests for fat and starch. Interpret results from simple food tests (e.g. fat, starch, protein, vitamin C). <p>Exceeding</p> <p>Interpret results from food tests for reducing and non-reducing sugars (glucose and sucrose).</p>		<p>Describe how Gram staining works and use results to identify differences between bacteria</p>	<ul style="list-style-type: none"> Relate the uses of different elements to their chemical properties. <p>Securing</p> <ul style="list-style-type: none"> Name the compounds formed by a reaction between a metal and a non-metal. Describe how catalysts affect the speed or rate of a reaction. Describe some applications of catalysts in everyday use. Model simple reactions of metals and non-metals using word equations. <p>Exceeding</p> <ul style="list-style-type: none"> Use valencies to deduce the formula of simple two-element compounds including transition metals. 	<ul style="list-style-type: none"> Classify mixtures as suspensions, colloids and solutions, based on what they look like and whether they separate on standing. <p>Exceeding</p> <ul style="list-style-type: none"> Classify colloids as, foams, emulsions, gels, aerosols based on what they are made up of. <p>Justify the decision to separate a mixture in a certain way.</p>	<ul style="list-style-type: none"> Explain why organisms are in competition in a given habitat. Describe how the distribution of organisms is controlled by the availability of resources. Explain how changes in a population or community in an ecosystem affect other populations. Use food webs to predict the effects of changes in populations. <p>Exceeding</p> <ul style="list-style-type: none"> Evaluate food chains and food webs as models of feeding relationships. <p>Use data to create food webs.</p>
<p>Working scientifically activity grid</p> <p>Skills and AOs</p>	<p>FoodStudents carry out simple tests for starch (a carbohydrate), lipids and protein.</p> <p>Demonstrate an experiment to test the water content of foods.</p>	<p>Show students some sheep lungs, pointing out the trachea with rings of cartilage to hold it open, and the spongy texture of the lungs due to the air inside the air pockets. If</p>	<p>Collect bacteria from their skin or lab surface that can then be grown on nutrient agar 'plates'.</p>	<p>Metals and non-metals Acids and alkalis Chemical energy Types of reaction</p> <p>Enquiry activity Use experimental results to suggest an order of</p>	<p>Exploring: Cleaning water Students research how waste water from homes and offices is cleaned and treated to produce water that is safe for</p>	<p>Maths Skills Use an owl pellet to show how scientists might gather evidence for the construction of food webs, where animals have more than one</p>

	<p>Place anhydrous (blue) cobalt chloride paper on a food sample. It will turn pink in the presence of water.</p> <p>Food Tests - Iodine, Biuret, Benedict's, Ethanol, DCPIP</p> <p>Exploring: <i>Amylase action</i> Students carry out an investigation to find out about an enzyme called amylase, which is found in digestive juices produced in the salivary glands and pancreas</p>	<p>a tube is inserted down one of the bronchi, the lung can be inflated using a bicycle or foot pump is measured.</p> <p>Students carry out a simple test for suppleness. A student sits on the floor with his/her feet against a box or low bench. They reach forward and the distance they can reach past their toes models, practical work and simulations. Students carry out a simple test for suppleness.</p> <p>Show students some sheep lungs, pointing out the structures</p>		<p>Students use a microscope with a ×100 oil-immersion objective lens to view pre-prepared slides of <i>Lactobacillus bulgaricus</i> and <i>Streptococcus thermophilus</i></p>	<p>reactivity of various metals Investigate a phenomenon that relies on an exothermic or endothermic reaction Investigate changes in mass for chemical and physical process</p>	<p>release into the environment, and even for drinking. They should focus on the physical aspects of removing suspended and dispersed solids in the water</p>	<p>food source.</p> <p>Thinking skills Consider All Possibilities: The population of squirrels in a wood increases. (Possible answers: there has been a lot of food available; the population of the squirrels' predator has decreased; the population of an organism that eats similar food to squirrels has decreased.)</p>
Topic	Rocks and weathering	The Earth		Energy	Magnets and electromagnets	Light	Forces
Assessment	<p>Mastery Tasks Developing</p> <ul style="list-style-type: none"> Recall what earthquakes and volcanoes are. 	<p>Mastery Task Developing</p>		<ul style="list-style-type: none"> Mastery Task: Developing Identify situations in which energy is stored. 	<p>Mastery Task Developing</p> <ul style="list-style-type: none"> Describe the shape of the magnetic field 	<p>Mastery Tasks Developing</p> <ul style="list-style-type: none"> Recall that light travels in straight lines and can pass 	<p>Mastery Task Developing</p> <ul style="list-style-type: none"> Name different forces, such as

<ul style="list-style-type: none"> Recall some uses for rocks and some products made from limestone. State what rocks are made of. Recall why different rocks have different properties. Recall some examples of rocks with different textures. Explain why certain rocks are porous and/or permeable. <p>Securing</p> <ul style="list-style-type: none"> Relate features of a landscape to the type of rock and how it has weathered. Explain why certain rocks are used for certain applications. <p>Exceeding</p> <p>Interpret formulae to identify the types of, and ratio of, atoms in a compound.</p>	<ul style="list-style-type: none"> State what is meant by a magnetic field and recall the shape of the field of a bar magnet. Describe the effect of the Earth's magnetic field on compass needles. Explain how to arrange two magnets so that they attract or repel each other. <p>Securing</p> <ul style="list-style-type: none"> Recall the direction of a magnet's magnetic field. Explain how a compass can be used together with maps for navigation. Explain how a plotting compass can be used to show the shape and direction of a magnetic field. Describe the Earth's magnetic field and explain why a magnetic compass needle points north. <p>Exceeding</p> <ul style="list-style-type: none"> Describe the shape of the magnetic field 		<ul style="list-style-type: none"> Identify situations in which an energy transfer is taking place. Recall the different ways in which energy can be stored. Recall the different ways in which energy can be transferred. <p>Securing</p> <ul style="list-style-type: none"> Recall the law of conservation of energy. Identify situations in which energy is stored. Identify situations in which an energy transfer is taking place. Describe energy transfer chains for given situations. <p>Exceeding</p> <ul style="list-style-type: none"> Identify useful and wasted energies. 	<p>around a wire carrying a current.</p> <ul style="list-style-type: none"> Describe an electromagnet and the shape of its magnetic field. Describe how the strength of an electromagnet can be changed. Explain how electromagnets are used in simple applications. <p>Securing</p> <ul style="list-style-type: none"> Explain how changing the size or direction of the current affects the magnetic field. Explain how electromagnets are used in relays. Describe how a wire carrying a current must be oriented in a magnetic field to produce a force. Describe how the motor effect is used in a simple electric motor and how the force it produces can be changed. <p>Exceeding</p>	<p>through empty space.</p> <ul style="list-style-type: none"> State the meaning of: opaque, translucent, transparent, reflect, scatter, transmit, absorb. Use the ray model of light to explain how we see things that are not sources of light and to explain how shadows are formed. Recall that sound does not travel as quickly as light, and sound needs a medium through which to travel but light does not. State the meaning of transverse wave and recall that light waves are transverse waves. <p>Securing</p> <ul style="list-style-type: none"> Compare longitudinal and transverse waves. Represent the path of light as straight lines with arrows on diagrams and 	<p>weight, friction, upthrust, drag.</p> <ul style="list-style-type: none"> Identify the forces acting on moving and stationary objects, and the directions in which they act. Explain the effects of balanced and unbalanced forces in a range of situations. Describe how drag changes with speed. <p>Securing</p> <ul style="list-style-type: none"> Calculate the resultant of forces acting along the same line. Explain why vehicles or other moving objects have a top speed. <p>Exceeding</p> <p>Use scale drawings to find the resultant of forces in two dimensions</p>
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		<p>between two bar magnets in different arrangements.</p> <p>Use ideas about the Earth's magnetic field to explain variation, dip and deviation.</p>		<ul style="list-style-type: none"> • Use Fleming's left-hand rule and the right-hand grip rule. <p>Explain how the motor effect is used in unfamiliar devices</p>	<p>describe how you can demonstrate that light travels in straight lines.</p> <ul style="list-style-type: none"> • Use a ray diagram to explain how shadows are formed and to explain image formation in pinhole cameras. <p>Exceeding</p> <ul style="list-style-type: none"> • Use ray diagrams to model and explain the effect of hole size on the image formed by a pinhole camera. <p>Use a model to explain the effect of various factors on shadow size</p>	
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<p>Working scientifically activity Skills</p>	<p><i>Motor effect demonstration</i> Introduce students to Fleming's left-hand rule</p> <p>Demonstrate the motor effect. Students build a simple electric motor of the 'Westminster pattern', using a motor kit.</p>	<p>Students find the shape of a magnetic field by placing a sheet of paper over a bar magnet and sprinkling iron filings onto the paper.</p> <p>Predict what will happen if a magnet is held near the top of the pin.</p>	<p>Compare the running costs of fluorescent and filament light bulbs</p> <p>Explain the energy transfers in a hand-crank torch</p> <p>Explain how an electric motor raising a weight is doing work</p> <p>Investigate how to prevent heat loss by conduction, convection and radiation</p>	<p>Investigate ways of varying the strength of an electromagnet</p> <p>Explore the magnetic field pattern around different types or combinations of magnets</p>	<p>Students investigate how the size and number of holes in a pinhole camera affects the image.</p> <p>Demonstrate that light travels in straight lines.</p>	<p>Investigate variables on the speed of a toy car rolling down a slope Concept Speed Gravity Contact forces Pressure Enquiry activity Explain the way in which an astronaut's weight varies on a journey to the moon Investigate factors that affect the size of frictional or drag forces Investigate how pressure from your foot onto the ground varies with different footwear</p>
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