



Science Faculty Curriculum Overview

The study of science should fire pupils' curiosity about phenomena in the world around them and offer opportunities to find explanations. It will instil wonder and drive a desire to ask 'How? Why?' and spark independent learning. Science can engage learners at many levels, developing enquiring minds by linking direct practical experience with scientific ideas. Experimentation and modelling can be encouraged to develop and evaluate explanations to facilitate critical, organised thinking together with creative thought.

Pupils learn how knowledge and understanding in science are rooted in evidence and how the academic resilience of scientists has impacted on society today. They discover how scientific ideas contribute to technological change – affecting industry, business and medicine and improving quality of life. They trace the development of science worldwide and recognise its cultural significance. They learn to question, respect and discuss issues that may affect their own lives, the directions of societies and the future of the world. Their passion to enhance and nurture our planet may provide answers to very real, current environmental problems as well as a route to further learning. There are a number of key concepts that underpin the study of science and how science works. Pupils need to understand these concepts in order to deepen and broaden their knowledge, skills and understanding. Successful mastery of science concepts will facilitate potential entry into a vast number of employment opportunities encompassing many aspects of everyday life such as medicine, energy production, materials and environmental issues.

Term 1	Term 2	Term 3

Autumn 1 (8weeks) (7weeks)	Spring 1 – (6 weeks)(6 weeks)	Summer 1 – (5 weeks)(7 weeks)
<p><u>Organisms: Recalled Knowledge</u> <i>Recall the life cycles of plants and animals (KS2 Science)</i> <i>State the different parts of a plant (KS2 Science)</i> <i>Give the functions of a skeleton (KS2 Science)</i> <i>Explain why muscles work together (KS2 Science)</i></p> <p><u>Organisms: Recalled Skills</u></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p>Introduction to Science</p> <p><u>Organisms: New Knowledge</u> State examples of tissues Name the main parts of a skeleton Relate the properties of bone to the functions of the skeleton State where the joints are found Describe the structure and function of the joints Define and use the term antagonistic Describe the function of major muscle groups Define the term cell Compare plant and animal cells Give the functions of the various parts of plant and animal cells Name and describe examples of specialised plant and animal cells Define and describe the term diffusion Identify structures in an amoeba and a euglena. Explain how uni-cellular organisms are adapted to carry out different functions. Introduce Tier 3 vocabulary</p> <p><u>Organisms: New Skills</u> Give the order of hierarchy in an multi-cellular organism Measure the force exerted by different muscles</p>	<p><u>Genes: Recalled Knowledge</u> <i>Define the term adaptation (KS2 Science)</i> <i>Recall that environments can change, posing dangers to organisms (KS2 Science)</i> <i>State that offspring are not always identical to their parents (KS2 Science)</i> <i>Describe the changes humans go through from birth to old age(KS2 Science)</i></p> <p><u>Genes: Recalled Skills</u> <i>Relate the adaptations of animals and plants to their environment (KS2 Science)</i> <i>Use life cycles to show the different stages in an organism's life (KS2 Science)</i></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p><u>Genes: New Knowledge</u> State the causes of variation in a species Compare continuous and discontinuous variation Describe how variation helps species to survive Explain how species are adapted to their environment List the changes that occur during puberty Differentiate between adolescence and puberty Name and describe the functions of the main structures in the male and female reproductive systems Describe the function and structure of the gametes State what is meant by fertilisation Describe the process of fertilisation Give causes of low fertility in males and females State what is meant by gestation Describe what happens during gestation and birth Explain what substances are passed between mother and fetus State what the menstrual cycle is.</p>	<p><u>Ecosystems: Recalled Knowledge</u> <i>State what a food chain and food web are (KS2 Science)</i> <i>Recall that environments can change, posing dangers to organisms (KS2 Science)</i> <i>Recall the resources that plants need to grow (KS2 Science)</i> <i>Explain the function of a flower (KS2 Science)</i> <i>Describe the function of pollen (KS2 Science)</i></p> <p><u>Ecosystems: Recalled Knowledge</u> <i>Use food chains and webs to show feeding relationships (KS2 Science)</i></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p><u>Ecosystems: New Knowledge</u> State what food webs and food chains are in terms of the different tropic stages State the factors that affect the population of a species Define the term bioaccumulation and explain how it occurs Explain the importance of insect pollinators to food supplies Define and use the terms ecosystem, community, habitat, niche and environment. List resources that animals and plants compete for Compare wind and insect pollinated plants State what is meant by fertilisation (plant) Describe the process of fertilisation and germination in plants State the ways seeds can be dispersed and relate these ways to the adaptations of seeds. Introduce Tier 3 vocabulary</p>

<p>Use a diagram to predict the result of a muscle contraction or relaxation Explain how to use a microscope to observe a cell Match cell components to their functions Suggest the organism a cell comes from, given its features</p> <p><u>Practical Opportunities</u> Using a microscope to observe cheek/onion cell Diffusion demonstration Observing amoeba</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (how diffusion occurs) Assessed practical opportunity (writing up microscope practical)</p>	<p>Introduce Tier 3 vocabulary</p> <p><u>Genes: New Skills</u> Represent intraspecies variation using graphs Label diagrams of the male and female reproductive systems Recognise the male and female gametes Represent the menstrual cycle diagrammatically</p> <p><u>Practical Opportunities</u> Investigating arm span</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (menstrual cycle) Assessed practical opportunity (Investigating arm span)</p>	<p><u>Ecosystems: New Skills</u> Combine food chains to make food webs Use graphs to describe interactions between predators and prey Identify the structures of a flower and link these to their function</p> <p><u>Practical Opportunities</u> Investigating the distribution of a plant (using a quadrat) Flower dissection Seed dispersal modelling</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (process of pollination and fertilisation in a plant) Assessed practical opportunity (distribution of a plant)</p>
<p>Christmas Holiday</p>	<p>Easter Holiday</p>	<p>Summer Holiday</p>

Year 7 Chemistry

Term 1	Term 2	Term 3
<p>Autumn 1 (8weeks) (7weeks)</p> <p><u>Reactions: Recalled Knowledge</u> <i>Recall that everything is made up of particles (KS2 Science)</i> <i>State that materials can exist in the solid, liquid or gaseous state (KS2 Science)</i> <i>Use simple particle theory to explain changes of state (KS2 Science)</i> <i>Define the terms element and compounds (KS2 Science)</i></p>	<p>Spring 1 – (6 weeks)(6 weeks)</p> <p><u>Matter: Recalled Knowledge</u> <i>Recall that different materials have different properties (KS2 Science)</i> <i>State that materials can exist in the solid, liquid or gaseous state (KS2 Science)</i> <i>Give examples of reversible and non-reversible reactions (KS2 Science, Y7, Reactions: Chemical Reaction)</i></p>	<p>Summer 1 – (5 weeks)(7 weeks)</p> <p><u>Earth: Recalled Knowledge</u> <i>Recall how sedimentary, igneous and metamorphic rocks were formed (KS2 Science)</i> <i>State that the earth and other planets orbit the Sun (KS2 Science)</i> <i>Define the term moon and explain how the moon orbits the earth (KS2 Science)</i></p>

<p><i>Give examples of elements and compounds (KS2 Science)</i> <i>Compare elements and compounds (KS2 Science)</i> <i>Compare reversible and non-reversible reactions (KS2 Science)</i> <i>Recall simple reversible and non-reversible reactions (KS2 Science)</i></p> <p><u>Reactions: Recalled Skills</u> <i>State the different parts of a reaction (products and reactants) (KS2 Science)</i> <i>Use reactions to differentiate between reversible and non-reversible reactions (KS2 Science)</i></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p>Introduction to Science</p> <p><u>Reactions: New Knowledge</u> Compare chemical reactions and physical changes Differentiate between acids and alkalis Define and give examples of common indicators List the factors that affect the pH of a solution Name strong and weak acids State the products formed in a neutralisation reaction Give uses for neutralisation reactions Name 3 magnetic elements Compare the properties of metals and non-metals State the products formed from various reactions (metal + oxygen, metal + acid, metal + water) Define and give examples of displacement reactions Introduce Tier 3 vocabulary</p> <p><u>Reactions: New Skills</u> Describe the chemical characteristics of a reaction</p>	<p><i>Recall the various changes of state (KS2 Science)</i> <i>Define the term solubility (KS2 Science)</i> <i>Define the term diffusion (Y7, Organisms, Movement of Substances)</i></p> <p><u>Matter: Recalled Skills</u> <i>Use evaporation to separate a dissolved solid from its solution (KS2 Science)</i> <i>Use filtration to separate a solid from a liquid (KS2 Science)</i></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p><u>Matter: New Knowledge</u> Describe the particle model of matter Explain the properties of different materials (including solids, liquids and gases) based on their arrangement of particles Use particle theory and information about transfer of energy to describe how changes of state occur Compare boiling and evaporation Review the term diffusion in terms of particle theory Explain how gas pressure occurs Define the term atom Compare elements and compounds State the properties of a pure substance and a mixture Define the terms solution, solute, solvent and solubility Explain how substances dissolve using the particle model State why filtration, evaporation and distillation work as separation techniques Describe how chromatography works to separate substances Introduce Tier 3 vocabulary</p> <p><u>Matter: New Skills</u></p>	<p><i>Explain why we have day and night (KS2 Science)</i></p> <p><u>Earth: Recalled Skills</u> <i>Classify rocks according to their properties (KS2 Science)</i></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p><u>Earth: New Knowledge</u> Name and compare the 3 rock layers in the earth Describe how sedimentary, igneous and metamorphic rocks are formed Give examples of sedimentary, igneous and metamorphic rocks List the processes that lead to igneous, sedimentary and metamorphic rocks being interconverted Describe the properties of ceramics List and categorise the objects you can see in the night sky Describe the solar system Name some of the phases of the moon Explain why we see some of the phases of the moon Introduce Tier 3 vocabulary</p> <p><u>Earth: New Skills</u> Classify rocks according to their properties</p> <p><u>Practical Opportunities</u> Investigation of sedimentary, igneous and metamorphic rocks Make a volcano</p> <p><u>Assessment Opportunities</u> EOUT</p>
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<p>Use indicators to categorise substances as acidic or alkaline Describe a method for making a neutral solution from an acid and an alkali Predict the salt formed in different neutralisation reactions Identify an unknown element from its chemical and physical properties Use word equations to represent the reactions of (metal + oxygen, metal + acid, metal + water) Predict the outcome of various displacement reactions</p> <p><u>Practical Opportunities</u> Circus of chemical and physical reactions Testing acids and alkalis with indicators Making red cabbage indicator Strong and weak acid practical Neutralisation experiments with indigestion remedies Making salts Testing conductivity of metals and non-metals Metals and acid practical Burning metals in oxygen Demo Group 1 metals with water Displacement reactions</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (comparison of chemical and physical reactions) Assessed practical opportunity (making a salt)</p>	<p>Draw before and after diagrams to explain observations about changes of state Draw before and after diagrams to explain observations about diffusion Draw before and after diagrams to explain observations about gas pressure Recognise the state of a substance in relation to its mp and bp Use diagrams to represent atoms, elements and compounds Use mp information to categorise a substance as pure or a mixture Use solubility curves to explain observations about solutions Choose when to use filtration, evaporation and distillation as an appropriate separation technique Use evidence from chromatography to identify unknown substances</p> <p><u>Practical Opportunities</u> Density calculations Cooling curve Measuring the boiling point of solutions Demo sublimation Demo diffusion Solubility experiments Filtration Evaporation Distillation Chromatography</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (States of matter- particle arrangement) Assessed practical opportunity (Chromatography and distillation)</p>	<p>DIRT tasks related to assessment Extended writing task (how rocks are recycled)</p>
<p>Christmas Holiday</p>	<p>Easter Holiday</p>	<p>Summer Holiday</p>

Year 7 Physics

<p>Term 1</p>	<p>Term 2</p>	<p>Term 3</p>
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Autumn 1 (8weeks) (7weeks)	Spring 1 - (6 weeks)(6 weeks)	Summer 1 - (5 weeks)(7 weeks)
<p><u>Forces: Recalled Knowledge</u> <i>State some common forces (friction, air resistance) (KS2 Science)</i> <i>Compare contact and non-contact forces(KS2 Science)</i> <i>Recall how magnetic forces act(KS2 Science)</i> <i>Explain how gravity acts (KS2 Science)</i> <i>Describe why unsupported objects fall towards earth (KS2 Science)</i></p> <p><u>Forces: Recalled Skills</u></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p><u>Forces: New Knowledge</u> State the unit of force Describe what is meant by an interaction pair Describe what happens when the resultant force is not zero State the formula for speed Describe the link between speed, journey time and movement of the observer State the value of g on earth and on the moon Differentiate between mass and weight Describe how gravitational force varies with mass and distance Explain why objects stay in orbit Introduce Tier 3 vocabulary</p> <p><u>Forces: New Skills</u> Use a force diagram to represent resultant forces Use force diagrams to describe situations involving gravity</p>	<p><u>Electricity: Recalled Knowledge</u> <i>State that appliances run on electricity (KS2 Science)</i> <i>Recall that a bulb will light if there is a battery and a complete loop (KS2 Science)</i> <i>Identify and compare conductors and insulators (KS2 Science)</i> <i>State that bulbs will get brighter if there are more cells in a circuit (KS2 Science)</i></p> <p><u>Electricity: Recalled Skills</u> <i>Construct working circuits safely (KS2 Science)</i> <i>Use symbols when drawing electrical circuits (KS2 Science)</i></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p><u>Electricity: New Knowledge</u> Define potential difference and explain how it affects the way circuits work Define resistance and explain how it affects how components work Describe the pd across series and parallel circuits Compare series and parallel circuits Describe what is meant by current Describe what happens to current in series and parallel circuits Describe the properties of an electric field State how charged objects interact Introduce Tier 3 vocabulary</p> <p><u>Electricity: New Skills</u> Use an analogy to explain potential difference Draw circuit diagrams that measure potential difference</p>	<p><u>Energy: Recalled Knowledge</u> Recall that animals get their food from plants and other animals (KS2 Science) Recall that animals cannot make their own food (KS2 Science) State that common appliances run on electricity (KS2 Science) Recall that unsupported objects fall to earth because of gravity (KS2 Science, Y7 Forces, Gravity) Give examples of common forces (air resistance etc) (KS2 Science, Y7, Forces, Introduction to forces)</p> <p><u>Energy: Recalled Skills</u></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p><u>Energy: New Knowledge</u> State the unit of energy Give examples of renewable and non-renewable resources Compare renewable and non-renewable resources Describe how energy is transferred from an energy resource to an electrical device List various types of energy store Define the term dissipation Explain how energy is dissipated in a range of situations Introduce Tier 3 vocabulary</p> <p><u>Energy: New Skills</u> Compare the energy content of food and fuels Compare the energy content of food and fuels with energy requirements</p>

<p>Use the formula for speed Interpret distance-time graphs to calculate speed and describe journeys Use the formula to calculate weight on different planets</p> <p><u>Practical opportunities</u> Measuring forces practical Are the forces balanced or unbalanced? Speed of a car down a ramp Gravity cups</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (Describing a journey from a distance time graph) Assessed practical opportunity (Measuring forces)</p>	<p>Use a formula to calculate resistance Make circuits and describe what components with resistance do Use an analogy to explain resistance Make series and parallel circuits from circuit diagrams Use a diagrams to explain how objects become charged up</p> <p><u>Practical opportunities</u> Van de graaff generator and acetate rod practical Measure and investigate current Measure and investigate potential difference Investigating the resistance of a wire Series and parallel comparison</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (how resistance changes) Assessed practical opportunity (Investigating the resistance of a wire)</p>	<p>Evaluate the advantages and disadvantages of renewable and non-renewable resources Calculate the cost for home energy usage Compare the energy usage and cost of running different home devices Use a model of energy transfer between stores to describe how to get jobs done Show how energy is transferred in real-life examples Calculate the use energy and the amount dissipated, given values of input and output energy</p> <p><u>Practical opportunities</u> Burning fuel in foods Energy transfers and stores circus Investigate the efficiency of light bulbs</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (Evaluating the advantages and disadvantages of renewable and non-renewable resources) Assessed practical opportunity (Burning energy in food)</p> <p><u>Waves : Recalled Knowledge</u> Recall that light travels in straight lines and is reflected from surfaces (KS2 Science) State that dark is the absence of light (KS2 Science) Recall that light from the sun can be dangerous (KS2 Science) Explain how shadows are formed (KS2 Science) Recall that sounds are made by vibrating objects (KS2 Science)</p> <p><u>Waves: Recalled Skills</u> <i>Change the way an object vibrates by altering the pitch and loudness of a sound (KS2 Science)</i></p> <p><u>Waves: New Knowledge</u> State the speed of sound Describe how sound travels Relate loudness to amplitude</p>
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		<p>Describe the amplitude of a wave from an oscilloscope trace Relate frequency to wavelength Describe the frequency of a wave from an oscilloscope trace Name parts of the ear Describe how the ear works Explain how the ear can be damaged State the speed of light Describe how images are formed in a plane mirror in reflection Describe how light refracts when it enters a medium Compare what happens when light passes through lenses and transparent materials Name parts of the eye Explain how lenses are used to correct vision Compare colours in terms of their frequency Introduce Tier 3 vocabulary</p> <p><u>Waves: New Skills</u> Explain observations were sound is and isn't transmitted Use drawings of waves to describe how sound waves change with volume Use drawings of waves to describe how sound waves change with pitch Label a diagram of the ear Use ray diagrams of eclipses to explain what observers may see Use ray diagrams to show how light reflects and forms images Construct a ray diagram to show how light refracts Label a diagram of the eye Use ray diagrams to show how light passes through the lens in the eye Use the ray model to describe how objects appear different colours</p> <p><u>Practical opportunities</u> Measure the speed of sound signal generator to identify changes in frequency and amplitude create a model ear measure the brightness of light with increasing distance specular and diffuse reflection</p>
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		light colour mixing Cows eye dissection Assessment Opportunities EOUT DIRT tasks related to assessment Extended writing task Assessed practical opportunity (Measuring the brightness of light)
Christmas Holiday	Easter Holiday	Summer Holiday

Term 1	Term 2	Term 3
<p>Autumn 1 (8weeks) (7weeks)</p> <p>Organisms: Recalled Knowledge Evaluate the impact diet, exercise, drugs and lifestyle have on the body (KS2 Science) State that animals cannot make their own food (KS2 Science, Y7 Ecosystems: Food chains and webs and Energy: Food and fuels) Recall the different functions of teeth (KS2 Science) Recall the different parts and function of the digestive system (KS2 Science)</p> <p>Organisms: Recalled Skills Evaluate the amount of nutrition humans need to be healthy (KS2 Science)</p> <p>General Scientific Enquiry Skills. Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p>Organisms: New Knowledge Describe the function of the gas exchange system and relate it to its function</p>	<p>Spring 1 - (6 weeks)(6 weeks)</p> <p>Ecosystems: Recalled Knowledge State the functions of the parts of a flower and plant (KS2 Science, Y7 Ecosystems, Flowers and pollination) Recall the requirements for life (KS2 Science, Y7 Ecosystems Competition) Recall how water is transported in plants (KS2 Science)</p> <p>Ecosystems: Recalled Skills</p> <p>General Scientific Enquiry Skills. Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p>Ecosystems: New Knowledge State what happens during aerobic respiration Compare aerobic and anaerobic respiration Relate specific activities to aerobic and anaerobic respiration Describe how bread, beer and wine are made Recall how plants make glucose using photosynthesis List the resources needed for photosynthesis and describe how they are obtained</p>	<p>Summer 1 - (5 weeks)(7 weeks)</p> <p>Genes: Recalled Knowledge Define the term adaptation and give examples of adaptations (KS2 Science, Y7 Genes, Adapting to change) Recall that living things change over time and fossils provide evidence of that change (KS2 Science) Living things are not identical to their parents (KS2 Science)</p> <p>Genes: Recalled Skills</p> <p>General Scientific Enquiry Skills. Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p>Genes: New Knowledge Describe the theory of natural selection and explain why evolution occurs State factors that lead to extinction Explain the importance of biodiversity in maintaining plant and animal populations</p>

<p>Explain why your breathing rate and volume can change Compare the processes of inhaling and exhaling Evaluate the impact of smoking, exercise and asthma on the gas exchange system Differentiate between medicinal and recreational drugs Evaluate the effects of drugs (in particular alcohol and tobacco) on health and behaviour, pregnancy and conception) Recall the colloquial name for ethanol List the components of a healthy diet Compare the nutritional components of different foods and diets Describe the effects of deficiencies and excesses of nutrients on an individual's health Recall how you obtain and use energy State the health impact cause by unbalanced diets State what happens during digestions Define the term enzyme and give their role in the digestive system Describe the role of bacteria in the digestive system Relate the structure of the parts digestive system to their function Introduce Tier 3 vocabulary</p> <p><u>Organisms: New Skills</u> Use the bell-jar model to explain what happens during breathing Describe how to test for starch, lipids, sugar and protein and state the positive test for these nutrients Calculate the energy requirements of individuals of differing lifestyles Label a diagram of the digestive system Explain what happens to the nutrients in a meal as they pass through the digestive system</p> <p><u>Practical Opportunities</u> Comparing inhaled and exhaled air Measuring volume of exhaled air Vs height Reaction time practical Food tests Energy in food practical Demo H₂O₂ prac Enzyme practical</p>	<p>Describe the structure and function of the main components of a leaf Explain how a leaf is adapted for photosynthesis State the factors that affect the rate of photosynthesis Explain how fertilisers are used Give the role of nitrates, phosphates, potassium and magnesium in plant growth Introduce Tier 3 vocabulary</p> <p><u>Ecosystems: New Skills</u> Use a word equation to represent aerobic respiration Use a word equation to represent anaerobic respiration Use a word equation to represent fermentation Use a word equation to represent photosynthesis Represent the limiting factors of photosynthesis graphically Describe how to test a leaf for starch</p> <p><u>Practical Opportunities</u> Effect of exercise on breathing rates Rate of fermentation Pondweed demo (using computer simulation) Observing the stomata of a leaf Testing a leaf for starch</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (how to test a leaf for starch) Assessed practical opportunity (Effect of exercise on breathing rates)</p>	<p>Define the term "endangered species" Describe how characteristics are inherited Give the link between DNA, chromosomes and genes Explain how a DNA mutation may affect an organism and its future offspring Describe the structure of DNA and how scientists worked together to discover its structure Compare dominant and recessive alleles Explain why offspring are not identical to their parents Explain how genetic modification works Evaluate the advantages and disadvantages of genetic modification Introduce Tier 3 vocabulary</p> <p><u>Genes: New Skills</u> Describe why peer review is necessary Evaluate the evidence that led Darwin to develop his theory of natural selection List techniques that can be used to prevent extinction Use Punnett squares to show how genes are inherited</p> <p><u>Practical Opportunities</u></p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (explaining natural selection using the finches as examples)</p>
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<p>Assessment Opportunities EOUT DIRT tasks related to assessment Extended writing task (digestion of a meal) Assessed practical opportunity (writing up food tests, reaction time practical and enzyme practical)</p>		
<p>Christmas Holiday</p>	<p>Easter Holiday</p>	<p>Summer Holiday</p>

Term 1	Term 2	Term 3
<p>Autumn 1 (8weeks) (7weeks)</p> <p>Matter: Recalled Knowledge <i>Recall that everything is made of particles (KS2 Science, Y7 Matter, The particle model)</i> <i>State that all materials are made up of one or more elements (Y7 Matter, Inside particles)</i> <i>Recall that elements are listed in the periodic table (Y7 Reactions: More about elements)</i> <i>Recall that the metals are listed on the left of the periodic table and the non-metals are listed on the right (Y7 Reactions, More about elements)</i> <i>Differentiate between chemical and physical properties (Y7 Reactions, Chemical reactions)</i></p> <p>Matter: Recalled Skills</p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p>Matter: New Knowledge Define the term element, atom, compound and mixture Recall the symbols of 16 elements Compare compounds and mixtures</p>	<p>Spring 1 – (6 weeks)(6 weeks)</p> <p>Reactions: Recalled Knowledge <i>Recall that chemical reactions are not easily reversible (Y7 Reactions: Chemical reactions)</i> <i>List the signs that indicate a chemical reaction may have taken place (Y7 Reactions: Chemical Reactions)</i> <i>Explain what happens in burning reactions (KS2 Science, Y7 Reactions: Chemical reactions of metals and non-metals)</i></p> <p>Reactions: Recalled Skills <i>Name the different parts of a written word equation (Y7 Reactions, Chemical reactions of metals and non-metals)</i> <i>Represent reactions as word equations (Y7 Reactions, Chemical reactions of metals and non-metals)</i></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p>REactions: New Knowledge Describe the model of chemical change and conservation of mass State what happens during combustion</p>	<p>Summer 1 – (5 weeks)(7 weeks)</p> <p>Earth: Recalled Knowledge <i>State that the sun heats the surface of the Earth (KS2 Science, Y7 Earth : The Earth)</i> <i>Recall that carbon dioxide in the atmosphere causes global warming (KS2 Science)</i> <i>State that metals can join with other elements in compounds (Y7 Reactions, Reactions of metals and non-metals Y8 Matte: Compounds)</i> <i>Recall that rocks are mixtures of minerals (KS2 Science, Y7 Earth: the structure of the earth)</i> <i>Explain how metals are arranged in terms of their reactivity (KS2 Science, Y7 Reactions, More about elements, Y8 Matter: Elements of Group 1)</i></p> <p>Earth: Recalled Skills <i>Evaluate the impact of global warming on the weather (KS2 Science)</i></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p>

<p>Compare atoms and molecules Describe the structure of a polymer Relate the properties of a polymer to the arrangement of its molecules Relate the group and the period of an element to its properties State the properties and reactivity of the group 1 elements Describe the reactions of the group 1 metals State the properties and reactivity of the group 7 elements Describe the reactions of the group 7 elements State the properties and reactivity of the group 0 elements Describe the reactions of the group 0 elements Introduce Tier 3 vocabulary</p> <p><u>Matter: New Skills</u> Use observations from experiments to explain why a substance must be an element Represent atoms and molecules using particle diagrams Use particle diagrams to classify a substance as an element, compound or mixture Name compounds using their chemical formulae Use chemical formulae to name the elements present and determine their relative proportions Represent polymers using particle diagrams Use data to describe a trend in the physical properties of a set of elements in the periodic table Use observations to describe trends and predict properties of the group 1 metals Use observations to describe trends and predict properties of the group 7 elements Use observations to describe trends and predict properties of the group 0 elements</p> <p><u>Practical Opportunities</u> Making compounds Demo Group 1 elements with water Displacement reactions of Group 7</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (trends and reactivity of Group 1 and Group 7 elements)</p>	<p>State the energy transfer involved in combustion State what happens during thermal decomposition State what is meant by conservation of mass Compare exothermic and endothermic reactions Identify whether an energy level diagram is showing an exothermic or endothermic reaction State what happens to bonds in chemical reactions Introduce Tier 3 vocabulary</p> <p><u>Reactions: New Skills</u> Write word equations for chemical reactions (combustion, thermal decomposition) Use particle diagrams to represent chemical reactions (combustion, thermal decomposition) Predict the products formed from combustion, thermal decomposition reactions Calculate masses of reactants and products Balance symbol equations Use experimental observations to differentiate between exothermic and endothermic reactions Use energy level diagrams to explain energy changes in exothermic and endothermic reactions Use bond energies to predict energy changes in reactions</p> <p><u>Practical Opportunities</u> Combustion Thermal decomposition of carbonates Examples of exothermic and endothermic reactions</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (comparing endothermic and exothermic reactions) Assessed practical opportunity (Thermal decomposition, conservation of mass, endothermic and exothermic reactions)</p>	<p><u>Earth: New Knowledge</u> State the link between increase in greenhouse gases and increase in global temperature Name 2 greenhouse gases Recall the composition of the earth's atmosphere Explain what is meant by global warming List the processes that recycle carbon naturally State one cause of global warming that scientists have evidence for Evaluate the impact of humans on the carbon cycle and global warming Define the term ore Recall the methods of extracting metals State why certain natural resources will run out Explain why recycling is important Describe how the earth's resources are recycled Introduce Tier 3 vocabulary</p> <p><u>Earth: New Skills</u> Represent the carbon cycle diagrammatically Justify the method of extracting an ore, given a set of data Suggest factors to consider when extracting metals</p> <p><u>Practical Opportunities</u> Displacement reactions Demonstration of electrolysis</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (evaluation of our impact on global warming) Assessed practical opportunity (writing up displacement reactions)</p>
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Assessed practical opportunity (Describe the reactions of Group 1 elements)		
Christmas Holiday	Easter Holiday	Summer Holiday

	Term 1 (September - December)	Term 2 (January - April)	Term 3 (April - July)
Year 8	<p>Autumn 1 (8weeks)(7weeks)</p> <p><u>Forces: Recalled Knowledge</u> <i>State some forces require contact between two objects (KS2 Science (Y7 Forces: Introduction to forces)</i> <i>Give examples of some common forces (air resistance, gravity, friction) (KS2 Science, Y7 Forces: Introduction to Forces)</i></p> <p><u>Forces: Recalled Skills</u> <i>Explain that the shapes of solid objects can be changed by squashing, bending and twisting (KS2 Science)</i></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p><u>Forces: New Knowledge</u> Describe what happens to a moving object when the resultant force is zero Define the terms drag and equilibrium Describe the factors that affect the size of the drag force Describe how forces deform objects Define the term linear relationship Describe what is meant by a moment Describe how fluids exert pressure Explain the relationship between atmospheric pressure and height State the relationship between liquid pressure and depth</p>	<p>Spring 1 - (6 weeks)(6weeks)</p> <p><u>Energy: Recalled Knowledge</u> <i>Recall that vibrations from sounds pass through a medium to the ear (KS2 Science, Y7 Waves: Sound waves and speed, Y7 Waves: The ear and hearing)</i> <i>State how we see things (via light travelling from a source to the eye) (KS2 Science, Y7 Waves: Light, Y7 Waves: The eye and Vision)</i> <i>Recall that unsupported objects fall towards earth due to gravity</i> <i>(KS2 Science, Y7 Forces, Introduction to Forces, Gravity, Y8 Forces: Friction and drag)</i> <i>Give examples of forces that act between moving surfaces (air resistance, water resistance and friction) (Y7 Forces, Y7 Forces: Balanced and Unbalanced forces, Y8 Forces: Friction and drag)</i></p> <p><u>Energy: Recalled Skills</u></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p><u>Energy: New Knowledge</u> Define the term work and use the term to explain what simple machines do Compare the work needed to move objects different distances</p>	<p>Summer 1 - (5 weeks)(7week)</p> <p><u>Waves: Recalled Knowledge</u> <i>Recall that light from the sun can be dangerous (KS2 Science)</i> <i>Explain how light is reflected from surfaces (KS2 Science Y7 Waves: Light)</i> <i>State that sounds are made by vibrating objects (KS2 Science, Y7 Waves: Sound waves and speed)</i> <i>Describe how sounds are made by waves travelling through a medium (KS2 Science, Y7 Waves: Sound waves and speed, Y7 Waves: The ear and hearing)</i></p> <p><u>Waves: Recalled Skills</u></p> <p><u>General Scientific Enquiry Skills.</u> Ask scientific questions Plan investigations Record data Analyse patterns in data Evaluate data Give conclusions related to the data</p> <p><u>Waves: New Knowledge</u> Describe how sound transfers energy Explain how a microphone and loudspeaker work List the various parts of the electromagnetic spectrum Explain the effect of radiation on living cells Explain, in terms of frequency, the relative impact of electromagnetic waves on living cells Compare transverse and longitudinal waves Describe what happens when waves superimpose Introduce Tier 3 vocabulary</p>

<p>Explain how hydraulic machines work Define the term upthrust Explain why some objects float and some objects sink and link this to upthrust Define the term stress Explain the effect of solid surfaces on each other using the term stress Introduce Tier 3 vocabulary</p> <p><u>Forces: New Skills</u> Draw the forces acting on an object in contact situations Use Hooke's law to show how the extension of a spring is altered in different situations Calculate the moment of a turning force Calculate pressure in fluids in a variety of situations Use particle diagrams to demonstrate how pressure is exerted</p> <p><u>Practical Opportunities</u> Friction experiment Dropping cup cake cases experiment Extension of a spring experiment Seesaw experiment Demonstrations Pressure in liquids & gases Float or sink activity Stress (Pressure) experiment pressing bungs into plasticine.</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (floating and sinking) Assessed practical opportunity (extension of a spring)</p>	<p>Differentiate between energy and temperature Explain why objects change temperature (using the model of energy loss and gain) Use the particle model to describe how energy is transferred Describe how a thermal insulator can reduce energy transfer State sources of infrared radiation Compare conduction convection and radiation Describe how energy is transferred to the sun Introduce Tier 3 vocabulary</p> <p><u>Energy: New Skills</u> Show how a lever works diagrammatically Show convention currents diagrammatically Compare insulation methods</p> <p><u>Practical Opportunities</u> Definition of work, work done climbing stairs Measuring Forces using ramps, gears, pulleys and levers Heating 100ml and 200ml water. Kinetic Theory Infra-red radiation experiment Insulation experiment</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (compare insulation methods) Assessed practical opportunity (measuring forces)</p> <p><u>Electromagnets: Recalled Knowledge</u> <i>Recall that magnetic forces act at a distance (KS2 Science, Y7 Forces: Gravity)</i> <i>State some magnetic materials (KS2 Science, Y7 Reactions: More about elements)</i> <i>Explain that magnets attract and repel each other, and attract and repel some materials but not others (KS2 Science)</i></p> <p><u>Electromagnets: Recalled Skills</u></p>	<p><u>Waves: New Skills</u> Relate amplitude and frequency to energy Use wave models to compare longitudinal and transverse waves Use models to explain wave behaviour</p> <p><u>Practical Opportunities</u> Demonstrate slinky for longitudinal wave, CRO, vibrating plate and ultrasound Introducing electromagnetic spectrum Demo Transverse wave (and longitudinal), examples of each with slinky basic and go through wave form Use ripple tank to demonstrate reflection and refraction</p> <p><u>Assessment Opportunities</u> EOUT DIRT tasks related to assessment Extended writing task (compare transverse and longitudinal waves) Assessed practical opportunity</p>
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