



# 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><b><u>Organisms: Recalled Knowledge</u></b>  <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><b><u>Organisms: Recalled Skills</u></b></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><b><u>Organisms: New Knowledge</u></b>                      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><b><u>Organisms: New Skills</u></b>                      Give the order of hierarchy in an multi-cellular organism                      Measure the force exerted by different muscles</p>	<p><b><u>Genes: Recalled Knowledge</u></b>  <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><b><u>Genes: Recalled Skills</u></b>  <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><b><u>Genes: New Knowledge</u></b>                      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><b><u>Ecosystems: Recalled Knowledge</u></b>  <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><b><u>Ecosystems: Recalled Knowledge</u></b>  <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><b><u>Ecosystems: New Knowledge</u></b>                      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 pollenated 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><b><u>Practical Opportunities</u></b>                  Using a microscope to observe cheek/onion cell                  Diffusion demonstration                  Observing amoeba</p> <p><b><u>Assessment Opportunities</u></b>                  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><b><u>Genes: New Skills</u></b>                  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><b><u>Practical Opportunities</u></b>                  Investigating arm span</p> <p><b><u>Assessment Opportunities</u></b>                  EOUT                  DIRT tasks related to assessment                  Extended writing task (menstrual cycle)                  Assessed practical opportunity (Investigating arm span)</p>	<p><b><u>Ecosystems: New Skills</u></b>                  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><b><u>Practical Opportunities</u></b>                  Investigating the distribution of a plant (using a quadrat)                  Flower dissection                  Seed dispersal modelling</p> <p><b><u>Assessment Opportunities</u></b>                  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><b>Autumn 1 (8weeks) (7weeks)</b></p> <p><b><u>Reactions: Recalled Knowledge</u></b>  <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><b>Spring 1 – (6 weeks)(6 weeks)</b></p> <p><b><u>Matter: Recalled Knowledge</u></b>  <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><b>Summer 1 – (5 weeks)(7 weeks)</b></p> <p><b><u>Earth: Recalled Knowledge</u></b>  <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><b><u>Reactions: Recalled Skills</u></b>  <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><b><u>General Scientific Enquiry Skills.</u></b>          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><b><u>Reactions: New Knowledge</u></b>          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><b><u>Reactions: New Skills</u></b>          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><b><u>Matter: Recalled Skills</u></b>  <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><b><u>General Scientific Enquiry Skills.</u></b>          Ask scientific questions          Plan investigations          Record data          Analyse patterns in data          Evaluate data          Give conclusions related to the data</p> <p><b><u>Matter: New Knowledge</u></b>          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><b><u>Matter: New Skills</u></b></p>	<p><i>Explain why we have day and night (KS2 Science)</i></p> <p><b><u>Earth: Recalled Skills</u></b>  <i>Classify rocks according to their properties (KS2 Science)</i></p> <p><b><u>General Scientific Enquiry Skills.</u></b>          Ask scientific questions          Plan investigations          Record data          Analyse patterns in data          Evaluate data          Give conclusions related to the data</p> <p><b><u>Earth: New Knowledge</u></b>          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><b><u>Earth: New Skills</u></b>          Classify rocks according to their properties</p> <p><b><u>Practical Opportunities</u></b>          Investigation of sedimentary, igneous and metamorphic rocks          Make a volcano</p> <p><b><u>Assessment Opportunities</u></b>          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><b><u>Practical Opportunities</u></b> 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><b><u>Assessment Opportunities</u></b> 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><b><u>Practical Opportunities</u></b> Density calculations Cooling curve Measuring the boiling point of solutions Demo sublimation Demo diffusion Solubility experiments Filtration Evaporation Distillation Chromatography</p> <p><b><u>Assessment Opportunities</u></b> 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><b>Christmas Holiday</b></p>	<p><b>Easter Holiday</b></p>	<p><b>Summer Holiday</b></p>

Year 7 Physics

<p><b>Term 1</b></p>	<p><b>Term 2</b></p>	<p><b>Term 3</b></p>
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Autumn 1 (8weeks) (7weeks)	Spring 1 - (6 weeks)(6 weeks)	Summer 1 - (5 weeks)(7 weeks)
<p><b><u>Forces: Recalled Knowledge</u></b>  <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><b><u>Forces: Recalled Skills</u></b></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><b><u>Forces: New Knowledge</u></b>                      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><b><u>Forces: New Skills</u></b>                      Use a force diagram to represent resultant forces                      Use force diagrams to describe situations involving gravity</p>	<p><b><u>Electricity: Recalled Knowledge</u></b>  <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><b><u>Electricity: Recalled Skills</u></b>  <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><b><u>Electricity: New Knowledge</u></b>                      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><b><u>Electricity: New Skills</u></b>                      Use an analogy to explain potential difference                      Draw circuit diagrams that measure potential difference</p>	<p><b><u>Energy: Recalled Knowledge</u></b>                      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><b><u>Energy: Recalled Skills</u></b></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><b><u>Energy: New Knowledge</u></b>                      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><b><u>Energy: New Skills</u></b>                      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><b><u>Waves: New Skills</u></b> 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><b><u>Practical opportunities</u></b> 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  <b><u>Assessment Opportunities</u></b> 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><b>Autumn 1 (8weeks) (7weeks)</b></p> <p><b><u>Organisms: Recalled Knowledge</u></b>                      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><b><u>Organisms: Recalled Skills</u></b>                      Evaluate the amount of nutrition humans need to be healthy (KS2 Science)</p> <p><b><u>General Scientific Enquiry Skills.</u></b>                      Ask scientific questions                      Plan investigations                      Record data                      Analyse patterns in data                      Evaluate data                      Give conclusions related to the data</p> <p><b><u>Organisms: New Knowledge</u></b>                      Describe the function of the gas exchange system and relate it to its function</p>	<p><b>Spring 1 - (6 weeks)(6 weeks)</b></p> <p><b><u>Ecosystems: Recalled Knowledge</u></b>                      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><b><u>Ecosystems: Recalled Skills</u></b></p> <p><b><u>General Scientific Enquiry Skills.</u></b>                      Ask scientific questions                      Plan investigations                      Record data                      Analyse patterns in data                      Evaluate data                      Give conclusions related to the data</p> <p><b><u>Ecosystems: New Knowledge</u></b>                      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><b>Summer 1 - (5 weeks)(7 weeks)</b></p> <p><b><u>Genes: Recalled Knowledge</u></b>                      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><b><u>Genes: Recalled Skills</u></b></p> <p><b><u>General Scientific Enquiry Skills.</u></b>                      Ask scientific questions                      Plan investigations                      Record data                      Analyse patterns in data                      Evaluate data                      Give conclusions related to the data</p> <p><b><u>Genes: New Knowledge</u></b>                      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><b><u>Organisms: New Skills</u></b>                  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><b><u>Practical Opportunities</u></b>                  Comparing inhaled and exhaled air                  Measuring volume of exhaled air Vs height                  Reaction time practical                  Food tests                  Energy in food practical                  Demo H<sub>2</sub>O<sub>2</sub> 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><b><u>Ecosystems: New Skills</u></b>                  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><b><u>Practical Opportunities</u></b>                  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><b><u>Assessment Opportunities</u></b>                  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><b><u>Genes: New Skills</u></b>                  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><b><u>Practical Opportunities</u></b></p> <p><b><u>Assessment Opportunities</u></b>                  EOUT                  DIRT tasks related to assessment                  Extended writing task (explaining natural selection using the finches as examples)</p>
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<p><b>Assessment Opportunities</b>                  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><b>Christmas Holiday</b></p>	<p><b>Easter Holiday</b></p>	<p><b>Summer Holiday</b></p>

Term 1	Term 2	Term 3
<p><b>Autumn 1 (8weeks) (7weeks)</b></p> <p><b><u>Matter: Recalled Knowledge</u></b>  <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><b><u>Matter: Recalled Skills</u></b></p> <p><b><u>General Scientific Enquiry Skills.</u></b>                  Ask scientific questions                  Plan investigations                  Record data                  Analyse patterns in data                  Evaluate data                  Give conclusions related to the data</p> <p><b><u>Matter: New Knowledge</u></b>                  Define the term element, atom, compound and mixture                  Recall the symbols of 16 elements                  Compare compounds and mixtures</p>	<p><b>Spring 1 – (6 weeks)(6 weeks)</b></p> <p><b><u>Reactions: Recalled Knowledge</u></b>  <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><b><u>Reactions: Recalled Skills</u></b>  <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><b><u>General Scientific Enquiry Skills.</u></b>                  Ask scientific questions                  Plan investigations                  Record data                  Analyse patterns in data                  Evaluate data                  Give conclusions related to the data</p> <p><b><u>REactions: New Knowledge</u></b>                  Describe the model of chemical change and conservation of mass                  State what happens during combustion</p>	<p><b>Summer 1 – (5 weeks)(7 weeks)</b></p> <p><b><u>Earth: Recalled Knowledge</u></b>  <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><b><u>Earth: Recalled Skills</u></b>  <i>Evaluate the impact of global warming on the weather (KS2 Science)</i></p> <p><b><u>General Scientific Enquiry Skills.</u></b>                  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><b><u>Matter: New Skills</u></b> 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><b><u>Practical Opportunities</u></b> Making compounds Demo Group 1 elements with water Displacement reactions of Group 7</p> <p><b><u>Assessment Opportunities</u></b> 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><b><u>Reactions: New Skills</u></b> 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><b><u>Practical Opportunities</u></b> Combustion Thermal decomposition of carbonates Examples of exothermic and endothermic reactions</p> <p><b><u>Assessment Opportunities</u></b> 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><b><u>Earth: New Knowledge</u></b> 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><b><u>Earth: New Skills</u></b> 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><b><u>Practical Opportunities</u></b> Displacement reactions Demonstration of electrolysis</p> <p><b><u>Assessment Opportunities</u></b> 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><b>Autumn 1 (8weeks)(7weeks)</b></p> <p><b><u>Forces: Recalled Knowledge</u></b>  <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><b><u>Forces: Recalled Skills</u></b>  <i>Explain that the shapes of solid objects can be changed by squashing, bending and twisting (KS2 Science)</i></p> <p><b><u>General Scientific Enquiry Skills.</u></b>                      Ask scientific questions                      Plan investigations                      Record data                      Analyse patterns in data                      Evaluate data                      Give conclusions related to the data</p> <p><b><u>Forces: New Knowledge</u></b>                      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><b>Spring 1 - (6 weeks)(6weeks)</b></p> <p><b><u>Energy: Recalled Knowledge</u></b>  <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><b><u>Energy: Recalled Skills</u></b></p> <p><b><u>General Scientific Enquiry Skills.</u></b>                      Ask scientific questions                      Plan investigations                      Record data                      Analyse patterns in data                      Evaluate data                      Give conclusions related to the data</p> <p><b><u>Energy: New Knowledge</u></b>                      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><b>Summer 1 - (5 weeks)(7week)</b></p> <p><b><u>Waves: Recalled Knowledge</u></b>  <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><b><u>Waves: Recalled Skills</u></b></p> <p><b><u>General Scientific Enquiry Skills.</u></b>                      Ask scientific questions                      Plan investigations                      Record data                      Analyse patterns in data                      Evaluate data                      Give conclusions related to the data</p> <p><b><u>Waves: New Knowledge</u></b>                      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><b><u>Forces: New Skills</u></b>                  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><b><u>Practical Opportunities</u></b>                  Friction experiment                  Dropping cup cake cases experiment                  Extension of a spring experiment                  Seesaw experiment                  Demonstrations Pressure in liquids &amp; gases                  Float or sink activity                  Stress (Pressure) experiment pressing bungs into plasticine.</p> <p><b><u>Assessment Opportunities</u></b>                  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><b><u>Energy: New Skills</u></b>                  Show how a lever works diagrammatically                  Show convention currents diagrammatically                  Compare insulation methods</p> <p><b><u>Practical Opportunities</u></b>                  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><b><u>Assessment Opportunities</u></b>                  EOUT                  DIRT tasks related to assessment                  Extended writing task (compare insulation methods)                  Assessed practical opportunity (measuring forces)</p> <p><b><u>Electromagnets: Recalled Knowledge</u></b>  <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><b><u>Electromagnets: Recalled Skills</u></b></p>	<p><b><u>Waves: New Skills</u></b>                  Relate amplitude and frequency to energy                  Use wave models to compare longitudinal and transverse waves                  Use models to explain wave behaviour</p> <p><b><u>Practical Opportunities</u></b>                  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><b><u>Assessment Opportunities</u></b>                  EOUT                  DIRT tasks related to assessment                  Extended writing task (compare transverse and longitudinal waves)                  Assessed practical opportunity</p>
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