

ECKINGTON SCHOOL AGE-RELATED EXPECTATIONS

Science Year 7

	Year 7: Term 1	Year 7: Term 2	Year 7: Term 3
Topics studied	Cells and Movement Particle model and Elements Earth structure and the Universe Speed and Contact forces	Current, Voltage and resistance Heating and insulation Acids and alkalis Reproduction	Metals and non-metals Digestion Interdependence Variation Sound and light
	By the end of term 1 students should be able to: safely carry out a practical, accurately record results. Label diagrams of scientific equipment, use some scientific key terms.	By the end of term 2 students should be able to: make simple links between observations and scientific ideas use some scientific key terms.	By the end of term 3 students should be able to: Give detailed descriptions and simplified explanations using key scientific terminology. Make simple predictions about what they expect to happen in scientific investigations.
Biology	Cells and Movement <ul style="list-style-type: none"> <li>Name some examples of cells</li> <li>State the function of the organelles</li> <li>Describe structural adaptations of specialised plant and animal cells</li> <li>Describe structure of a bacterial cell</li> <li>Describe organisation of multicellular organisms</li> </ul>	Reproduction <ul style="list-style-type: none"> <li>Describe the main structures in the male and female reproductive system</li> <li>Describe the structure and function of sperm and egg cells</li> <li>Describe the stages of the menstrual cycle.</li> <li>State some reasons for infertility and fertility treatments.</li> </ul>	Digestion <ul style="list-style-type: none"> <li>Describe the components that make up a balanced diet</li> <li>Name organs of the digestive system</li> <li>Describe how food is broken down in the digestive system</li> </ul> Interdependence <ul style="list-style-type: none"> <li>Correctly draw and interpret food webs</li> <li>Describe feeding relationships involving food webs</li> </ul> Variation <ul style="list-style-type: none"> <li>Describe variation and identify genetic and Inherited variation</li> <li>Describe continuous and discontinuous variation.</li> </ul>
Chemistry	Particle model and Elements <ul style="list-style-type: none"> <li>Describe the arrangement of particles in a solid, liquid and gas and state their properties.</li> <li>Describe the changes of state in terms of the particle model</li> <li>Describe diffusion giving examples</li> </ul> Earth structure and the Universe	Acids and alkalis <ul style="list-style-type: none"> <li>Identify substances as acid, alkali or neutral based on observations with indicators</li> <li>Describe how pH changes in neutralisation reactions</li> <li>Name the salts that form when acids react with alkalis</li> </ul>	Metals and non-metals <ul style="list-style-type: none"> <li>Write word equations for chemical reactions.</li> <li>Describe properties of metals and non-metals.</li> <li>Use chemical symbols and formulae for elements and compounds</li> </ul>

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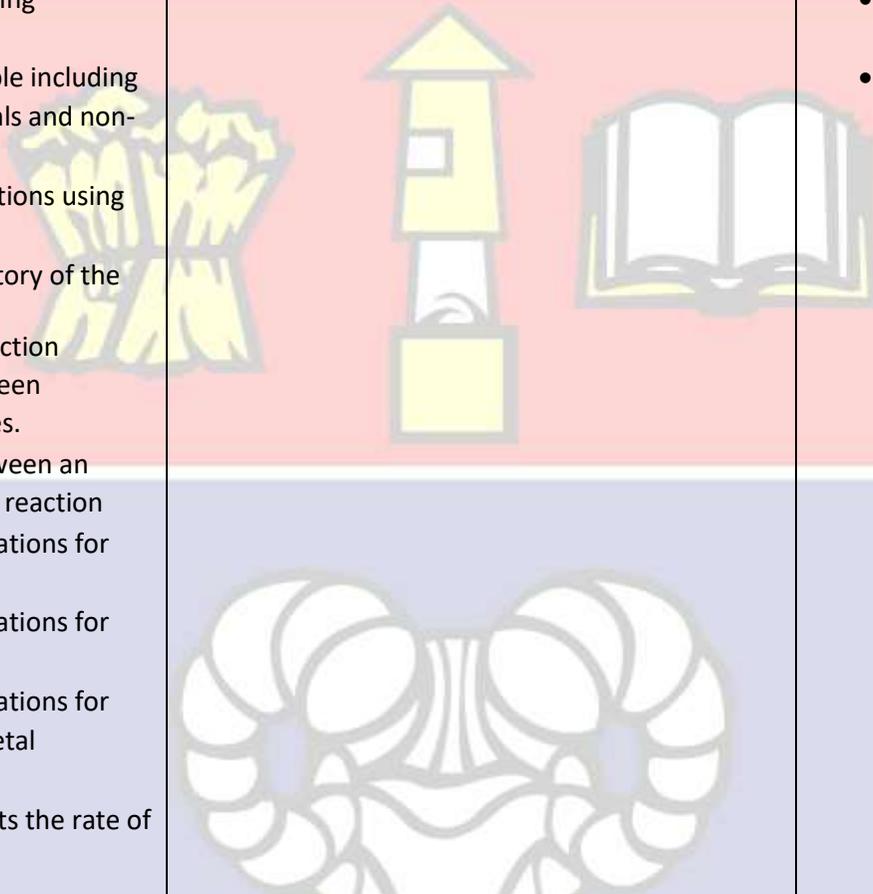
	<ul style="list-style-type: none"> <li>Describe the structure and composition of the earth</li> <li>Describe the rock cycle and the formation of igneous, sedimentary, and metamorphic rocks</li> <li>Describe how fossils are formed</li> <li>Describe the structure and objects in the Solar System</li> </ul>	<ul style="list-style-type: none"> <li>Write word equations to represent chemical reactions</li> </ul>	
<p>Physics</p>	<p>Speed and Contact forces</p> <ul style="list-style-type: none"> <li>Describe what changes occur when force is applied to an object</li> <li>Identify the forces acting on an object</li> <li>identify balanced/unbalanced forces using force diagrams with multiple arrows</li> <li>Calculate resultant forces</li> <li>Calculate speed given the formula</li> <li>Describe distance– time graphs</li> </ul>	<p>Current, Voltage and resistance</p> <ul style="list-style-type: none"> <li>Identify circuit components and symbols</li> <li>Draw circuit Diagrams</li> <li>Describe and Identify conductors and insulators</li> <li>Define current, and describe its behaviour in series and parallel circuits</li> <li>Define Voltage, and describe its behaviour in series and parallel circuits</li> <li>Calculate resistance using equations</li> </ul> <p>Heating &amp; Insulation</p> <ul style="list-style-type: none"> <li>Describe how temperature changes lead to energy transfers</li> <li>Describe the three methods of energy transfer: conduction, convection, radiation</li> <li>Describe and give an example of conductors and insulators of energy</li> </ul>	<p>Sound &amp; Light</p> <ul style="list-style-type: none"> <li>Describe how energy is transferred in sound waves</li> <li>Describe how loud and quiet, high-pitched, low-pitched sounds are made</li> <li>Label a human ear</li> <li>Describe how poor hearing could be caused.</li> <li>Describe the properties of light including reflection, absorption and refraction of light.</li> <li>Construct ray diagrams.</li> <li>Describe parts and functions of the eye and how we correct vision.</li> </ul>

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Science Year 8

	Year 8: Term 1	Year 8: Term 2	Year 8: Term 3
Topics studied	Periodic table and separating mixtures Energy transfer and Work Breathing and Circulation Chemical Energy and types of reactions	Gravity and Pressure Respiration and Photosynthesis Inheritance Climate	Evolution Earth's resources Wave effects and properties Magnets and Electromagnets
	By the end of term 1 students should be able to: Write a detailed method for an experiment and make a prediction.	By the end of term 2 students should be able to: Start to plan their own investigations. Make conclusions based on data.	By the end of term 3 students should be able to: make detailed conclusions. Use and apply information on a new context.
Biology	<p>Breathing and Circulation</p> <ul style="list-style-type: none"> <li>Name the 3 types of blood vessels in the circulatory system</li> <li>Describe the structure of human heart</li> <li>Describe the structure of the gas exchange system</li> <li>Describe the process of inhaling and exhaling</li> <li>Describe the role of diffusion in the movement of materials in and between cells</li> <li>Describe how lungs are adapted for efficient gas exchange</li> </ul>	<p>Respiration and Photosynthesis</p> <ul style="list-style-type: none"> <li>Write a word equation for photosynthesis</li> <li>Describe how leaves are adapted to carry out photosynthesis</li> <li>Describe the role of plants in maintaining the levels of gases in the atmosphere</li> <li>Describe aerobic respiration in a word equation representing products and reactants</li> <li>Describe anaerobic respiration</li> <li>Describe the differences between aerobic and anaerobic respiration</li> </ul> <p>Inheritance</p> <ul style="list-style-type: none"> <li>Describe genes and chromosomes, DNA and nucleus</li> <li>Describe the role of genes in inheritance</li> </ul>	<p>Evolution</p> <ul style="list-style-type: none"> <li>Describe how animals/ plants are adapted to survive</li> <li>Describe the process of natural selection.</li> <li>Describe the factors that cause extinction</li> <li>Describe the term biodiversity</li> </ul>
Chemistry	<p>Periodic table and separating mixtures</p> <ul style="list-style-type: none"> <li>Describe simple techniques for separating mixtures: filtration, evaporation, and chromatography</li> <li>Describe diffusion in terms of the particle model</li> </ul>	<p>Climate</p> <ul style="list-style-type: none"> <li>Describe the Carbon Cycle</li> <li>Describe the impact of human activities on climate change</li> </ul>	<p>Earth's resources</p> <ul style="list-style-type: none"> <li>Describe formation and extraction of crude oil</li> <li>Describe different ways to extract metal from the earth</li> </ul>

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	<ul style="list-style-type: none"> <li>• Describe mixtures, including dissolving</li> <li>• Describe the Periodic Table including periods and groups, metals and non-metals</li> <li>• Describe patterns in reactions using the periodic table</li> <li>• Describe some of the History of the periodic table</li> </ul> <p>Chemical energy and types of reaction</p> <ul style="list-style-type: none"> <li>• Describe the difference between chemical and physical changes.</li> <li>• Describe the differences between an exothermic and endothermic reaction</li> <li>• Describe and write word equations for oxidation reactions</li> <li>• Describe and write word equations for combustion reactions</li> <li>• Describe and write word equations for thermal decomposition of metal carbonates.</li> <li>• Describe how a catalyst affects the rate of a reaction</li> </ul>		<ul style="list-style-type: none"> <li>• Describe the environmental impacts of mining and quarrying.</li> <li>• Describe the advantages and disadvantages of recycling</li> </ul>
Physics	<p>Energy transfer and Work</p> <ul style="list-style-type: none"> <li>• Describe examples of energy stores</li> <li>• Describe examples of energy transfers</li> <li>• Calculate useful and wasted energy in energy transfers</li> <li>• Calculate Energy, work done and power using equations</li> </ul>	<p>Gravity and Pressure</p> <ul style="list-style-type: none"> <li>• Describe the difference between contact and non-contact forces</li> <li>• Describe the effect of gravity in different locations</li> <li>• Describe what is meant by mass, gravity, and weight.</li> <li>• Calculate weight using equations</li> </ul>	<p>Wave effects and properties</p> <ul style="list-style-type: none"> <li>• Identify the parts of a wave</li> <li>• Describe the different types of waves</li> <li>• Identify sounds of different frequency and amplitude</li> <li>• Describe uses of ultrasound</li> <li>• Describe uses and dangers of electromagnetic waves</li> </ul>

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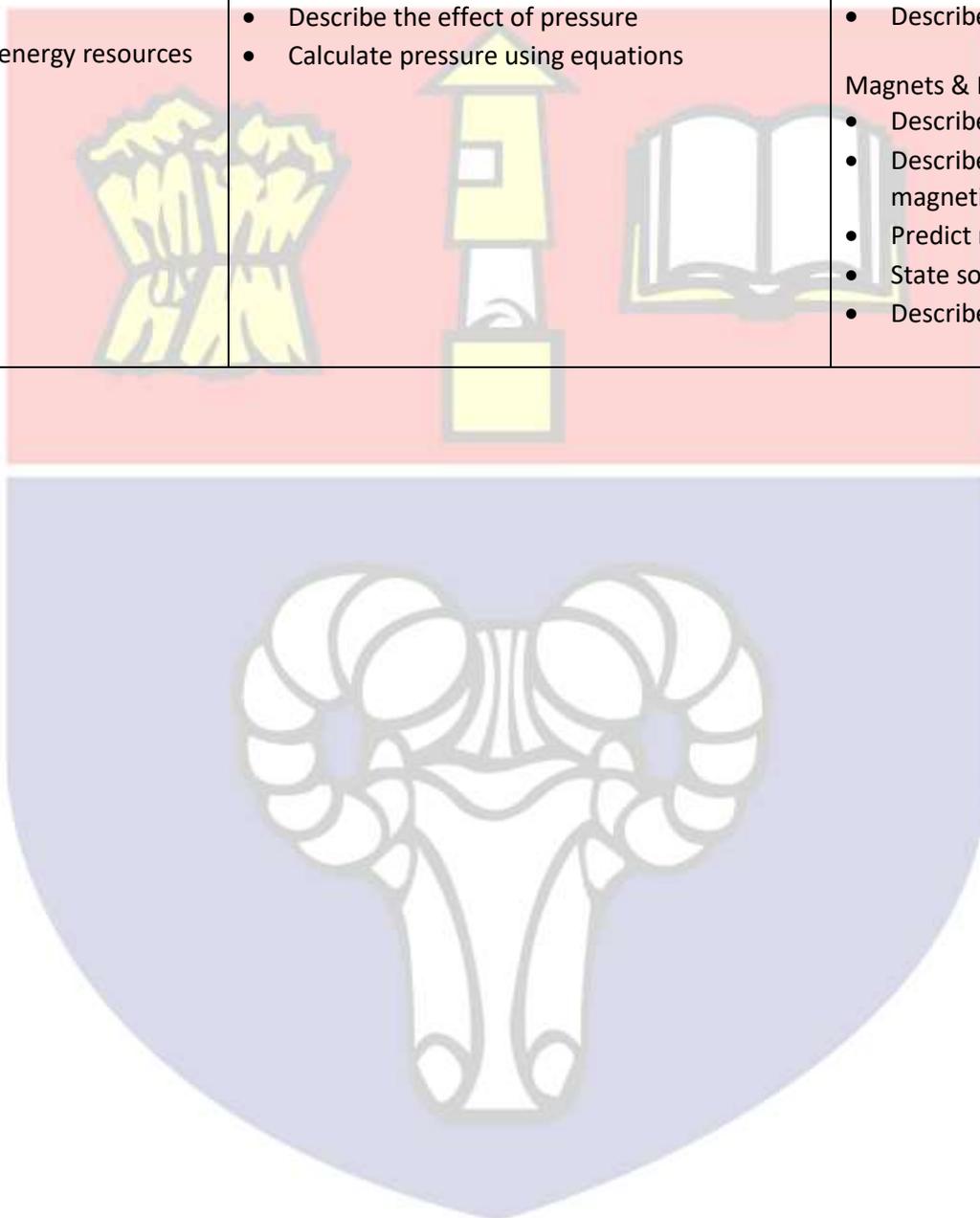
- Describe different fuels and energy resources

- Describe the effect of pressure
- Calculate pressure using equations

- Describe how different sound devices work

Magnets & Electromagnets

- Describe static charge and how it is produced
- Describe the difference between magnets and magnetic materials
- Predict magnetic attraction or repulsion
- State some uses of magnets and electromagnets.
- Describe how electromagnets work.



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Science Year 9

	Year 9: Term 1	Year 9: Term 2	Year 9: Term 3
Topics studied	Cell structure & transport, cell division Atomic Structure & the periodic table Energy and particles	Organisation in animals and plants Structure & Bonding Waves and Space Science	Ecology – Ecosystems & Biodiversity Structure & bonding cont. & The Earth's atmosphere Electricity and Magnetism
	By the end of term 1 students should be able to:	By the end of term 2 students should be able to:	By the end of term 3 students should be able to:
Biology	<p>Compare eukaryotic and prokaryotic cells, describe the function of their organelles.</p> <p>Describe how cells specialisation occurs</p> <p>Compare light and electron microscopes</p> <p>Explain the differences between diffusion, osmosis and active transport.</p> <p>Describe how the effectiveness of exchange surfaces is increased.</p> <p>Use the key words to describe the process of mitosis.</p> <p>Describe the importance of cell differentiation in multicellular organisms.</p> <p>Describe differences between embryonic and adult stem cells. Describe what therapeutic cloning can be used for.</p> <p>Calculate percentage change and use this to plot a line graph with negative numbers and draw a line of best fit.</p> <p>Making observations in experiments.</p>	<p>State the function of some of the organs of the digestive system.</p> <p>State one function of enzymes inside the body.</p> <p>Describe the effect that temperature and pH have on how well an enzyme works. Identify that carbohydrates break down carbohydrates, proteases break down proteins, and lipases break down lipids. Use the lock and key theory to explain why the shape of an enzyme is vital for it to function. Describe the functions of bile.</p> <p>Describe the function of xylem and phloem tissue.</p> <p>Explain how the structures of tissues in the leaf are related to their functions. Explain how factors affect the rate of transpiration.</p> <p>Design a results table to clearly record results</p> <p>Write a simple hypothesis and prediction.</p> <p>Identify the key variables in an investigation.</p>	<p>Describe what a community is</p> <p>Describe what abiotic and biotic factors are and how animals and plants that are successful thrive in different environments</p> <p>Describe what animals and plants compete for and how they're adapted to survive</p> <p>Describe the carbon cycle and the water cycle</p> <p>Describe what the human population affects</p> <p>Describe and give simple explanations of air pollution, land and water pollution, deforestation, peat destruction and global warming</p> <p>Link food chains to tropic levels and describe what happens to biomass throughout the food chain.</p> <p>Describe the issues surrounding food security and what we can do to make food production more sustainable.</p> <p>Use a scatter diagram to identify a correlation between two variables.</p>
Chemistry	<p>Describe the basic structure of an atom.</p> <p>Explain, including diagrams, the difference between a pure element, a mixture, and a compound.</p> <p>Describe atoms using the atomic model.</p> <p>Explain why atoms have no overall charge.</p> <p>Write the standard electronic configuration</p>	<p>Describe, with an example, how a Group 1 metal atom becomes a positive ion and how a Group 7 non-metal atom becomes a negative ion. Draw dot and cross diagrams of compounds formed between Group 1 and Group 7 elements.</p> <p>State some properties of ionic compounds.</p>	<p><b>The Earth's Atmosphere</b></p> <p>Describe a theory for the development of the Earth's atmosphere. State where methane and ammonia in the atmosphere may have come from.</p> <p>Describe the greenhouse effect.</p> <p>State some human activities that affect the proportion of greenhouse gases in the atmosphere.</p>

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	<p>notation from a diagram for the first 20 elements.</p> <p>Write word equations from descriptions of how Group 1 metals react with water. State the trend in reactivity in Group 1 &amp; Group 7.</p> <p>Describe how the electronic structure of metals and non-metals are different. Use the nuclear model to begin to explain how the outer electrons experience different levels of attraction to the nucleus.</p>	<p>Describe a covalent bond, recognise a covalent compound from its formula, name, or diagram showing bonds. Describe properties of small molecules.</p> <p>Describe an intermolecular force.</p> <p>State properties of giant covalent structures.</p> <p>Recognise the structure of a fullerene or nanotube in diagrams and prose. Explain the structure of fullerenes.</p> <p>Use data to draw conclusions</p>	<p>List some ways to reduce a carbon footprint.</p> <p>List some atmospheric pollutants.</p> <p>Use data to draw conclusions</p>
Physics	<p>Know that the energy in a closed system is constant</p> <p>Be able to identify how energy is transferred between different stores for various systems involving 2 stores of energy (e.g. K.E and E.P.E)</p> <p>Be able to perform simple energy and density calculations using recalled formulae</p> <p>Be able to describe an experiment to compare different thermal insulators</p> <p>Be able to describe an experiment to determine the density of regular, irregular solids and liquids</p> <p>Describe how substances change state - melt, freeze, boil, evaporate, condense or sublimate.</p> <p>Know that mass is conserved in these changes</p> <p>Plan and evaluate of a range of experiments.</p>	<p>Identify longitudinal and transverse waves</p> <p>Use the terms wavelength, amplitude and frequency correctly</p> <p>Calculate the speed of waves given observations from a ripple tank experiment</p> <p>Write down the correct order of the electromagnetic spectrum</p> <p>Describe some of the hazards of ultra-violet radiation and x-rays</p> <p>Construct ray diagrams to show how waves are refracted</p> <p>Understand the term "risk" when applied to exposure to EM radiation</p> <p>Identify uses for all the parts of the EM spectrum</p> <p>Describe the life cycle of a star</p> <p>Explain how gravity can keep one object in orbit around another</p> <p>Explain the meaning of the term red shift.</p> <p>Know that red-shift of light from galaxies indicates that are receding and this means the universe is expanding.</p>	<p>Draw the circuit symbols for common components</p> <p>Perform simple electrical calculations using recalled formulae</p> <p>Describe an experiment to investigate the relationship between the resistance of a wire and its length</p> <p>Describe an experiment to investigate the current-voltage characteristics of resistors, filament lamps and diodes</p> <p>Draw circuit diagrams using the correct symbols</p> <p>se circuit diagrams to construct and check series and parallel circuits that include a variety of common circuit components</p> <p>describe the difference between series and parallel circuits</p> <p>Describe the difference between permanent and induced magnetism</p> <p>Analyse experimental results (resistance practical) to produce a conclusion</p>