

**Curriculum intent (overview) – To deepen students’ skills and knowledge through a broad and balanced curriculum which prepares students for adulthood.**

## 9.2 - Explorer Curriculum – Science 6 Lessons Weekly

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Year	2023 – 2024 Autumn 1	2023 – 2024 Autumn 2	2023 – 2024 Spring 1	2023 – 2024 Spring 2	2023 – 2024 Summer 1	2023 – 2024 Summer 2
	<p><b>Topic:</b> (1) Dead or Alive (B1) (2) Physical or chemical change (C1) (3) Getting the message (P1)</p> <p><b>Suggested Key Questions:</b> What are the processes all living things do? How can we identify a physical or chemical change? What are the various technological methods for communication?</p> <p><b>Key Skills and Knowledge:</b> <b>Dead or Alive (B1)</b> 1. Recall the life processes MRS GREN: movement, respiration, sensitivity, growth, reproduction, excretion, and nutrition. 2. Be able to name the body systems:</p>	<p><b>Topic:</b> (1) Babies (B2) (2) Acids &amp; Alkalis (C2) (3) Full Spectrum (P2)</p> <p><b>Suggested Key Questions:</b> How do humans reproduce and how does a baby develop inside the womb? What are acids and alkalis? What is the electromagnetic spectrum?</p> <p><b>Key Skills and Knowledge:</b> <b>Babies (B2)</b> 1. Recall the names of the main organs and functions of the female and male reproductive system: ovary/ oviduct/womb/vagina/penis/testis/ sperm duct. 2. Recall that normal body cells have 46 chromosomes: females have 23 pairs (including</p>	<p><b>Topic:</b> (1) Control Systems (B3) (2) Everything in it's place (C3) (3) Medical rays (P3)</p> <p><b>Suggested Key Questions:</b> What are the various body control systems? What are atoms and how are atoms arranged in the periodic table? What rays are used to treat patients with specific conditions?</p> <p><b>Key Skills and Knowledge:</b> <b>Control Systems (B3)</b> 1. Understand that changes in our surroundings can affect our body's internal environment. 2. Know the ways the body gains or loses water. 3. Be able to name, locate and recall the function of the kidneys and the bladder.</p>	<p><b>Topic:</b> (1) Fooling your senses (B4) (2) Clean air and water (C4) (3) Hot Stuff (P4)</p> <p><b>Suggested Key Questions:</b> How do we sense the world around us? How is the environment around us affected by pollution? How can we reduce the loss of heat from our homes?</p> <p><b>Key Skills and Knowledge:</b> <b>Fooling your senses (B4)</b> 1. Be able to label a diagram of the eye and function of parts (limited to cornea, iris, pupil, lens, retina, optic nerve). 2. Know that the nose is lined with nerves sensitive to chemicals in the air. 3. Recall that taste</p>	<p><b>Topic:</b> (1) Gasping for breath (B5) (2) Novel Materials (C5) (3) Alternative Energy (P5)</p> <p><b>Suggested Key Questions:</b> What is the difference between breathing and respiration? How are novel materials different from natural materials? What are differences between renewable and non renewable energy sources?</p> <p><b>Key Skills and Knowledge:</b> <b>Gasping for breath (B5)</b> 1. Be able to name and locate windpipe, lungs, ribs. 2. Know the effects of smoking. 3. Recall the dangers of carbon monoxide. 4. Recall the equation of respiration naming products and purpose. 5. Demonstrate and</p>	<p><b>Topic:</b> Entry Level Coursework</p> <p><b>Suggested Key Questions:</b> How does the size of a meteorite affect the size of a crater?</p> <p><b>Key Skills and Knowledge:</b> <b>Key Skills:</b> Working scientifically skills: a) Planning to collect data. b) Processing the data. c) Identify patterns/ trends in data. d) Interpret data. e) Review the method.</p> <p>I am beginning to use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p>

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	<p>circulatory, respiratory and digestive.</p> <p>3. Be able to label and identify function of the nucleus, cytoplasm and cell membrane of an animal cell.</p> <p>4. Know that cells get substances in by diffusion, and active transport [No knowledge of the process is required].</p> <p>5. Know that new body cells are needed for growth and repair.</p> <p>6. Know about specialised cells: nerve/root hair/red blood/stem.</p> <p><b>Physical or chemical change (C1)</b></p> <p>1. Explain states of matter: Solid, Liquid, Gas</p> <p>2. Describe changes of state using the particle model.</p> <p>3. Use state symbols correctly: (s), (l), (g) and (aq).</p> <p>4. Explain chemical reactions using the terms products and reactants.</p>	<p>xx); males have 22 pairs and an odd pair (xy). fertilisation occurs by the fusion of a sperm and an egg cell, that creates a fertilised egg with 46 chromosomes.</p> <p>3. Know that the placenta is the exchange surface used to transfer substances between the mother and foetus and what happens to it after child birth.</p> <p>4. Know that chemicals called hormones are involved in reproduction to include male: testosterone female: oestrogen and progesterone.</p> <p>5. Recall some of the changes that occur in the female body after fertilisation: stopping periods and weight gain.</p> <p>6. Explain the use of hormones in contraception and evaluate hormonal and non-hormonal methods of</p>	<p>4. Know that blood sugar levels need to be controlled by insulin.</p> <p>5. Be able to name and locate and describe the function of the pancreas.</p> <p>6. Know that diabetes can be managed by controlling sugar levels in the diet and use of insulin.</p> <p><b>Everything in it's place (C3)</b></p> <p>1. Know the relative size of atoms and small molecules.</p> <p>2. Know that scientist's ideas of what an atom looks like (called the atomic model) and the periodic table has changed over time.</p> <p>3. Describe the atom as a nucleus containing protons and neutrons surrounded by particles called electrons. Identifying the masses.</p> <p>4. Use the names and symbols of the first 20 elements.</p>	<p>buds are located on the tongue and are sensitive to four tastes: salt, sweet, sour, bitter.</p> <p>4. Understand that the flavour of food diminishes when we have a cold and cannot smell.</p> <p>5. Know that sensor (receptor) cells detect stimuli, and effector cells (muscles) produce a response.</p> <p>6. Understand the need for simple reflex actions, i.e. for protection.</p> <p><b>Clean air and water (C4)</b></p> <p>1. Know that a mixture of gases called the atmosphere surrounds the Earth contains about 80% nitrogen and 20% oxygen and how it has changed.</p> <p>2. Know that fuels contain carbon, which forms carbon dioxide when the fuel burns and can test for the presence of carbon dioxide.</p> <p>3. Know that the</p>	<p>explain the test for carbon dioxide</p> <p>6. Know that during exercise more oxygen and glucose is needed by muscles.</p> <p><b>Novel Materials (C5)</b></p> <p>1. Know that carbon can form four covalent bonds.</p> <p>2. Explain the properties of diamond, graphite, fullerenes and grapheme in terms of their structures and bonding.</p> <p>3. Know that a composite material contains at least 2 different materials.</p> <p>4. Know that an alloy is a mixture of two or more elements, at least one of which is a metal.</p> <p>5. Understand the term 'smart' alloy.</p> <p>6. Interpret information linking the properties of materials to their uses.</p> <p><b>Alternative Energy (P5)</b></p> <p>1. Understand that every power station needs an energy source.</p> <p>2. Understand that fossil fuels are a limited energy source that when burned produce carbon dioxide.</p> <p>3. Know some renewable energy sources:</p>	<p>Use some scientific language to talk and, later, write about what they have found out. Use relevant scientific language. Use comparative and superlative language.</p>
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	<p>5. Use ideas about the behaviour of particles and bonds to explain the state.</p> <p>6. Explain using the particle model why in a non-enclosed reaction there may be loss of mass during a chemical reaction limited to one of the products being a gas.</p> <p><b>Getting the message (P1)</b></p> <p>1. Describe how sound waves in air are longitudinal waves.</p> <p>2. Explain how the motion of the molecules in a gas is related to its pressure e.g. shouting <i>versus</i> whispering.</p> <p>3. Know that coding a message increases its security.</p> <p>4. Know that digital signals are either on (1) or off (0).</p> <p>5. Know that light travels through space at a speed of 300 000 km/s.</p> <p>6. Understand how light travels along an optical fibre from one end to the other by</p>	<p>contraception.</p> <p><b>Acids &amp; Alkalis (C2)</b></p> <p>1. Be able to label simple laboratory apparatus.</p> <p>2. Know that the colour of some dyes can be changed by adding acids and alkalis.</p> <p>3. Understand safety precautions when using acids or alkalis.</p> <p>4. Know how to use the pH scale.</p> <p>5. Know that neutralisation occurs when acids and alkalis are mixed and uses of neutralisation.</p> <p>6. Know that acids produce protons (H<sup>+</sup>) and alkalis produce hydroxide ions (OH<sup>-</sup>).</p> <p><b>Full Spectrum (P2)</b></p> <p>1. Know that visible light is part of a group of waves called the electromagnetic spectrum.</p> <p>2. Know that all waves from the electromagnetic spectrum travel at the speed of light.</p>	<p>5. Recall the use and the names and symbols of the periodic Groups [1 (alkali metals), 7 (halogens) and 0 (noble gases)].</p> <p>6. Explain that isotopes are different forms of the same atom with a different number of neutrons.</p> <p><b>Medical rays (P3)</b></p> <p>1. Understand the difference between the diagnosis of an illness and its treatment.</p> <p>2. Recall some benefits of a doctor being able to see inside a patient’s body.</p> <p>3. Recall some medical uses and dangers of UV radiation and how to protect against exposure.</p> <p>4. Understand that bone absorbs X-rays and so produces shadow pictures.</p> <p>5. Know that a gamma camera detects gamma radiation and that a computer linked to it can make pictures.</p>	<p>increasing level of carbon dioxide is linked to global warming and effects of pollutants cause in the atmosphere.</p> <p>4. Know that carbon monoxide forms when fuels from crude oil burn in a limited supply of air.</p> <p>5. Know that a catalytic converter gets rid of pollutants like nitrogen oxides.</p> <p>6. Know that exhaust gas emissions are part of an MOT vehicle test.</p> <p><b>(4) Hot Stuff (P4)</b></p> <p>1. Know that energy can be transferred as heat and uses.</p> <p>2. Know that heat energy flows from a hot to a cooler body.</p> <p>3. Know that temperature is measured in °C and that heat is measured in J.</p> <p>4. Recall and use the words: melting, boiling, freezing, condensing, evaporating.</p> <p>5. Describe how, when substances</p>	<p>wind, sunlight, waves, tide, geothermal, hydro electric, biomass.</p> <p>4. Know how renewable energy is made using some of the sources: wind, wave, solar.</p> <p>5. Know that heating a house requires a lot of energy and that alternative sources of heating can be used.</p> <p>6. Be able to describe an experiment to show that black matt surfaces absorb more energy than white shiny surfaces.</p> <p><b>Key Skills:</b> Gather, record, and begin to classify and present data in a variety of ways to help in answering questions. Begin to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. Begin to report on findings from enquiries, including oral and</p>	
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	<p>reflection.</p> <p><b>Key Skills:</b> Begin to explore everyday phenomena and the relationships between living things and familiar environments. Begin to develop their ideas about functions, relationships and interactions.</p> <p>Begin to recognise some more abstract ideas and begin to recognise how these ideas help them to understand how the world operates.</p>	<p>3. Be able to list the colours of the visible spectrum (rainbow) in order from red to violet.</p> <p>4. Know that a visible spectrum can be produced when white light passes through a prism.</p> <p>5. Recall uses of lasers, infrared, microwaves.</p> <p>6. Understand the advantages of wireless technology for global communications.</p> <p><b>Key Skills:</b> Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers.</p> <p>Compare and group according to behaviour or properties, based on testing.</p>	<p>6. Know that UV radiation, X-rays and gamma rays are part of a family called the electromagnetic spectrum.</p> <p><b>Key Skills:</b> Can see a pattern in my results.</p> <p>Recognise when a simple fair test is necessary and help to decide how to set it up. Can think of more than one variable factor.</p>	<p>melt, freeze, evaporate, condense or sublimate, mass remains the same, but that these physical changes recover its original properties if the change is reversed.</p> <p>6. Understand the terms <i>insulator</i> and <i>conductor</i>.</p> <p><b>Key Skills:</b> Gather, record, and begin to classify and present data in a variety of ways to help in answering questions. Begin to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. Begin to report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p>	<p>written explanations, displays or presentations of results and conclusions.</p>	
<p>Links to Gatsby Benchmarks:</p>	<p>Benchmark 2, – Learning from the Career and Labor Market information. Benchmark 3 – Addressing the needs of the student and * -</p>	<p>Benchmark 2, – Learning from the Career and Labor Market information. Benchmark 3 – Addressing the needs of the student and * -</p>	<p>Benchmark 2, – Learning from the Career and Labor Market information. Benchmark 3 – Addressing the needs of the student and * -</p>	<p>Benchmark 2, – Learning from the Career and Labor Market information. Benchmark 3 – Addressing the needs of the student and * -</p>	<p>Benchmark 2, – Learning from the Career and Labor Market information. Benchmark 3 – Addressing the needs of the student and * -</p>	<p>Benchmark 2, – Learning from the Career and Labor Market information. Benchmark 3 – Addressing the needs of the student and * - Personal Guidance</p>

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	<p>Personal Guidance Benchmark 4 – Linking Curriculum to learning</p> <p>Students to consider what skills are needed to be a paramedic, chemist, soldier.</p>	<p>Personal Guidance Benchmark 8 – Personal Guidance</p> <p>Going into work places/remote visits. Research. Writing C.Vs and cover letters.</p>	<p>Personal Guidance Benchmark 5- Encounters with employers and employees</p> <p>Students to consider what skills are needed to be a GP, Physicist radiographer. Research.</p>	<p>Personal Guidance Benchmark 5- Encounters with employers and employees</p> <p>Students to consider what skills are needed to be a Surgeon, Mechanic, Property developer.</p>	<p>Personal Guidance Benchmark 6 – Experience of Work places</p> <p>Students to consider what skills are needed to be an astronomer, astronaut, explorer.</p>	<p>Benchmark 6 – Experience of Work places</p> <p>Students to consider what skills are needed to be an engineer, planner, investigator.</p>
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