

Science Year 7– Summer Term 2022

| | What? When? Why? | | | |
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| | BIOLOGY 7D Ecosystems | CHEMISTRY 8H Rocks | PHYSICS 7L Sound | CHEMISTRY 7H Atoms, elements & compounds |
| Lesson 1 Learning intentions | <p><u>Duckweed Practical</u></p> <p>Carry out an experiment, growing duckweed in beakers containing various concentrations of common salt, to identify that the plants are adapted to living in freshwater habitats.</p> <p>Make predictions</p> | <p><u>Uses of rocks</u></p> <p>Recall some uses for rocks and some products made from limestone</p> <p>Recall what earthquakes and volcanoes are</p> <p>Explain why certain rocks are used for certain applications.</p> <p>Relate features of a landscape to the type of rock and how it has weathered.</p> | <p><u>Moving Sounds</u></p> <p>Recognise that all matter consists of particles.</p> <p>Recall that sound travels through different materials by vibrations, and needs a medium.</p> <p>State the meaning of pitch, volume, intensity, frequency, amplitude.</p> <p>Describe how a sound changes as you get further from the source</p> <p>Use a model incorporating the idea of vibrations to explain how sound travels through different materials.</p> | <p><u>Earth's element</u></p> <p>Recall that different materials have different properties</p> <p>Recall that elements are often represented by symbols</p> <p>Explain why internationally agreed symbols and conventions are necessary in science communication</p> <p>Recognise some symbols for common elements</p> <p>Use the periodic table to look up symbols for elements</p> <p>Relate the uses of different elements to their properties</p> <p>Explain the advantages of recycling metals.</p> <p>Describe how some elements are found in their native states.</p> |

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| | | | <p>Use the terms frequency, amplitude, speed to describe waves.</p> <p>Recall that waves transfer energy without transferring matter. Explain why sounds are fainter further from the source in terms of the waves spreading out.</p> <p>Evaluate the use of a slinky as a model for sound waves.</p> <p>Explain why the intensity of sound decreases with increasing distance from a source in terms of the energy dissipating.</p> | <p>Explain why some elements have been known for much longer than others.</p> <p>Explain how new evidence has changed ideas about elements</p> |
| Lesson 2 Learning intentions | <p><u>Variation</u></p> <p>Recall the definition of the terms habitat, continuous variation, discontinuous variation and species.</p> <p>Identify variation between organisms of the same type and of different types.</p> <p>Identify examples of continuous and discontinuous variation</p> <p>Correctly use the term: species, hybrid.</p> <p>Describe how hybrids can be distinguished from species.</p> | <p><u>Describing Rocks</u></p> <p>State what rocks are made of</p> <p>Recall why different rocks have different properties</p> <p>Recall some examples of rocks with different textures</p> <p>Explain why certain rocks are porous and/or permeable</p> <p>Interpret formulae to identify the types of, and ratio of, atoms in a compound</p> | <p><u>Speed of sound</u></p> <p>Identify a solid, liquid or gas from the arrangement of particles.</p> <p>Recall that sound does not travel as quickly as light.</p> <p>Draw the arrangement of particles in a solid, liquid and gas.</p> <p>Describe how fast sound is transmitted by solids, liquids, gases.</p> <p>Use quantitative data to compare the speed of sound in solids, liquids, gases.</p> | <p><u>Metal & non-metals</u></p> <p>Identify some common materials as being metals or not</p> <p>Describe some common properties of metallic and non-metallic materials</p> <p>Describe the evidence needed to decide whether an element is a metal or a non-metal.</p> <p>Relate the uses of different elements to their properties (includes magnetism)</p> |

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| | Identify the parents of a hybrid. | | Calculate the speed of sound from data about echoes. Apply knowledge of sound to new situations. | Use ideas about the periodic table to identify the positions of metal and non-metal elements. Use evidence to classify unfamiliar materials as being metal elements, metallic, non-metal elements, non-metallic. Interpret experimental evidence to identify elements |
| Lesson 3 Learning intentions | <p><u>Measuring Variation</u></p> <p>Collect data about variation within the class</p> <p>Data can be presented in frequency diagrams, scatter graphs and bar charts.</p> | <p><u>Igneous rocks</u></p> <p>Recall the names of some igneous rocks</p> <p>Describe the textures and properties of igneous rocks</p> <p>Recall that the Earth consists of a core, mantle and crust</p> <p>Describe how magma can be erupted to form volcanoes</p> <p>Describe how igneous rocks are formed</p> <p>Explain how the size of crystals in igneous rocks is evidence for the speed of cooling and describe some factors that affect this.</p> <p>Use crystal size to classify igneous rocks as intrusive and extrusive.</p> | <p><u>Detecting sound</u></p> <p>Recall that human hearing can be damaged by loud sounds.</p> <p>Name the parts of the ear.</p> <p>Describe the functions of the parts of the ear.</p> <p>Describe how microphones convert sound into electrical signals.</p> <p>Explain how human hearing can be damaged by sound.</p> <p>Explain how animals can detect the direction from which a sound is coming.</p> | <p><u>Chemical Reactions</u></p> <p>Recall examples of chemical reactions in everyday life</p> <p>Recall some observations that indicate a chemical reaction</p> <p>Identify the products and reactants using a word equation</p> <p>Supply missing reactants or products to complete a word equation.</p> <p>Recall examples of energy being used to start a chemical reaction or keep it going</p> |

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| | | <p>Explain the variation in crystal size in an igneous intrusion, in terms of cooling rate.</p> <p>Compare the densities of igneous rocks and relate them to the minerals contained in the rocks</p> | | |
| Lesson 4 Learning intentions | <p><u>Adaptations & inherited variation</u></p> <p>Recall the physical environmental factors that make up the environment in a habitat.</p> <p>Recall the adaptations of a range of organisms to their habitats.</p> <p>Recall examples of inherited variation.</p> <p>Compare similar adaptations in plants and animals that live in similar places.</p> <p>Explain how particular adaptations increase the chances of survival.</p> <p>Explain how inherited variation is caused (does not include genes).</p> | <p><u>Weathering & erosion</u></p> <p>Recall some examples of physical changes and of chemical changes.</p> <p>Describe the effect of physical and biological weathering on rocks.</p> <p>Explain why rainwater is slightly acidic.</p> <p>Describe the effect of chemical weathering on rocks.</p> <p>Describe how weathering can break up rocks.</p> | <p><u>Sound Proofing</u></p> <p>Recall that sounds can be detected by sound meters and microphones.</p> <p>Compare how sounds travel through different materials.</p> <p>Recall the units for loudness.</p> <p>Evaluate different materials used for soundproofing/ sound insulation.</p> | <p><u>Making Compounds</u></p> <p>Describe how all other materials are made from the chemical elements.</p> <p>Recall some observations that indicate a chemical reaction.</p> <p>Describe how elements can combine to form compounds.</p> <p>Describe the changes in properties between a compound and its constituent elements.</p> <p>Name simple compounds formed from two elements.</p> <p>Recall that temperature changes occur during many chemical reactions.</p> <p>Represent atoms, molecules of elements and simple compounds using a model.</p> <p>Write simple chemical formulae from molecular structures</p> |

| Lesson 5 Learning intentions | <u>Effects of the environment</u> | <u>Erosion & Transportation</u> | <u>Using Sounds</u> | <u>Thermal Decomposition</u> |
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| | <p>Recall the definitions for community, ecosystem.</p> <p>Recall some physical environmental factors</p> <p>Recall how physical environmental factors vary on daily and seasonal basis</p> <p>Recall examples of environmental variation.</p> <p>Recall physical and behavioural adaptations of organisms to daily and seasonal changes, including deciduous and evergreen trees, nocturnal organisms, hibernation and migration.</p> <p>Explain how changes in a physical environmental factor in a habitat affect populations and communities.</p> <p>Explain how environmental variation is caused.</p> <p>Explain how particular adaptations increase the chances of survival.</p> <p>Explain how particular adaptations limit an organism's distribution.</p> | <p>Recall how weathered rocks are eroded and explain how fragments get worn down during transport</p> <p>Describe the link between the size of rock fragments carried and the water or wind speed.</p> <p>Compare the fragment sizes that can be transported by wind, water and ice.</p> <p>Compare quantitative data about the effect of speed on the size of grain that can be transported</p> | <p>Recall that different animals have different hearing ranges.</p> <p>State the meaning of: ultrasound, infrasound.</p> <p>Describe some uses of ultrasound.</p> <p>State the meaning of: absorb, transmit, reflect</p> <p>Explain how sonar and echolocation work.</p> <p>Calculate depth or distance from time and velocity of ultrasound</p> | <p>Describe what happens during thermal decomposition of a metal carbonate</p> <p>Identify thermal decomposition reactions</p> <p>Name compounds that contain two elements plus oxygen.</p> <p>Model simple reactions using word equations.</p> <p>Apply knowledge of thermal decomposition in carbonates to other compounds</p> |

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| | <p>Recall the differences between innate and learned behaviours.</p> <p>Describe how certain learned and innate behaviours can be beneficial to organisms.</p> | | | |
| <p>Lesson 6 Learning intentions</p> | <p><u>Algae Practical</u></p> <p>Carry out a practical to see the effect of an environmental factor on the growth of algae.</p> | <p><u>Sedimentary rocks</u></p> <p>Recall the names of some sedimentary rocks</p> <p>Describe the textures and properties of sedimentary rocks</p> <p>Describe how sedimentary rocks are formed.</p> <p>Describe how fossils are formed.</p> <p>Describe the link between the size of rock fragments deposited and the water or wind speed.</p> <p>Relate the grain size and roundness to transport history.</p> <p>Describe features in limestone landscapes and relate them to the way they were formed</p> | <p><u>Comparing Waves</u></p> <p>State the meaning of: transverse wave, longitudinal wave.</p> <p>Recall what sort of waves sound waves and waves on water are.</p> <p>Recall that waves transfer energy without transferring matter.</p> <p>Model transverse and longitudinal waves.</p> <p>Compare longitudinal and transverse waves.</p> <p>State the meaning of superposition, and give examples.</p> <p>Compare quantitatively how the intensity of sound waves and waves on water decrease with increasing distance from the source.</p> | <p><u>Types of Chemical Reaction</u></p> <p>Identify the products and reactants using a word equation</p> <p>Supply missing reactants or products to complete a word equation</p> <p>Name compounds that contain two elements plus oxygen.</p> <p>Model simple reactions using word equations.</p> |

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| <p>Lesson 7 Learning intentions</p> | <p><u>Effects on the environment</u></p> <p>Recall the resources that organisms need from their habitats and ecosystems.</p> <p>Recall the definition of a food chain, food web, carnivores, consumers, herbivores, omnivores, predators, prey, producers.</p> <p>Recall that the arrows in a food chain represent the direction of energy transfer</p> <p>Explain why organisms are in competition in a given habitat.</p> <p>Explain how the distribution of organisms is controlled by the availability of resources.</p> <p>Explain how changes in a population or community in an ecosystem affect other populations.</p> <p>Use food webs to predict the effects of changes in populations.</p> <p>Evaluate food chains and food webs as models of feeding relationships.</p> <p>Use data to create food webs.</p> | <p><u>Metals in the earth</u></p> <p>Define the term ore</p> <p>Identify metals which aren't found in ores</p> <p>Describe how metals are extracted from ores</p> <p>Compare extraction against recycling</p> | | <p><u>Air</u></p> <p>Recall the names of the most important gases that are mixed together in air</p> <p>Describe the difference between a mixture and pure substance</p> <p>Explain the differences between elements, compounds and mixtures (with reference to elements being substances that cannot be broken down into anything simpler by chemical means)</p> <p>Interpret particle models of mixtures, atoms, molecules, elements and compounds.</p> <p>Explain, in terms of atoms and particles, how air is a mixture of elements, compounds, atoms and molecules.</p> |
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| <p>Lesson 8 Learning intentions</p> | <p><u>Energy transfers in food chains</u></p> <p>Recall the definition of biomass</p> <p>Recall the sources and effects of some pesticides</p> <p>Explain the gains and losses of energy from living organisms.</p> <p>Interpret models of energy transfer (pyramids of numbers and biomass).</p> <p>Sketch pyramids of numbers and biomass</p> <p>Explain the effects of some persistent pesticides on ecosystems.</p> <p>Evaluate models of energy transfer in food chains (pyramids of number, biomass).</p> | <p><u>Metamorphic rocks & the rock cycle</u></p> <p>Recall the names of some metamorphic rocks</p> <p>Describe the textures and properties of metamorphic rocks</p> <p>Describe how metamorphic rocks are formed</p> <p>Use the rock cycle model to link the formation of igneous, sedimentary and metamorphic rocks.</p> <p>Appreciate the different timescales involved in different rock cycle processes, and give examples of fast and slow processes.</p> | | |
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