

East Lothian 'CFE Science' Framework

Organiser	Planet Earth	Biological Systems
Experiences and Outcomes	<p>I can distinguish between living and non-living things. I can sort living things into groups and explain my decisions. SCN 1-01a</p> <p>I can explore examples of food chains and show an appreciation of how animals and plants depend on each other for food. SCN 1-02a</p> <p>I can help to design experiments to find out what plants need in order to grow and develop. I can observe and record my findings and from what I have learned I can grow healthy plants in school. SCN 1-03a</p> <p>I am aware of different types of energy around me and can show their importance to everyday life and my survival. SCN 1-04a</p> <p>By investigating how water can change from one form to another, I can relate my findings to everyday experiences. SCN 1-05a</p> <p>By safely observing and recording the sun and moon at various times, I can describe their patterns of movement and changes over time. I can relate these to the length of a day, a month and a year. SCN 1-06a</p>	<p>By researching, I can describe the position and function of the skeleton and major organs of the human body and discuss what I need to do to keep them healthy. SCN 1-12a</p> <p>I have explored my senses and can discuss their reliability and limitations in responding to the environment. SCN 1-12b</p> <p>I know the symptoms of some common diseases caused by germs. I can explain how they are spread and discuss how some methods of preventing and treating disease benefit society. SCN 1-13a</p> <p>By comparing generations of families of humans, plants and animals, I can begin to understand how characteristics are inherited. SCN 1-14a</p>
On track in P2	<p>a I can sort living things into plant and animal groups using a variety of features.</p> <p>b I can explain that the sun is the main source of energy. I can explain that energy can be taken in by green plants to provide the major source of food for all living things.</p> <p>c I can design and carry out experiments using fair testing to find out what plants need to grow and develop. I can observe and measure the outcomes from growing plants in different conditions, for example, light, water, air, soil/nutrients and heat. I can record in writing, orally or visually using a variety of media. I can evaluate findings and discuss what I have learned about how plants grow.</p>	<p>c I can describe common diseases such as colds, mumps, measles, chicken pox and flu. I can describe what these diseases look like, feel like. I can explain how diseases are spread through germs and human contact supported by evidence. I can identify ways of preventing disease through good hygiene and vaccinations. I can explain why and how treating diseases helps our society.</p>
On track in P3	<p>a I can explain the difference between living, non-living and once living. I can create my own criteria for sorting living and non-living things and can justify decisions</p> <p>b I can explain the terms producer, consumer, predator and prey. I can create a simple food chain showing energy flow</p> <p>e I can explain the changes of states of water, for example, condensation, evaporation and water vapour. I can identify that water boils at 100 °C, freezes at 0°C and that ice melts at 0°C through experiment. I can identify factors that affect changes of state, for example, the size and shape of objects. I can describe the properties of water in each state, for example, liquid water is fluid, ice maintains shape and water vapour expands to fill vessel. I can identify examples from my everyday life of water changing state, for example at home and in nature.</p>	<p>d I can describe how genetic information is passed from one generation to the next. I can describe how genetic information can be seen in characteristics including body shape, colour of eyes and shape of petals. I can explain that specific information corresponding to a given characteristic is called a gene. I can discuss a science a family being a group which shares the same characteristics, for example, human family, cat family, dog family and flowering plants. I can use characteristics to create groups. I can discuss the variations within each family group.</p>
On track in P4	<p>d I can name different energy sources, for example, sun, food, fuel, wind and waves. I can identify different types of energy that we get from energy sources, for example, light, sound, heat, movement, electrical and chemical. I can explain the importance of different types of energy for everyday life and survival including stored energy from food for our body.</p> <p>f I can discuss the relative size of the Earth, Moon and Sun. I can explain that the Earth is the planet we live on which orbits the Sun. I can explain that the Earth is round and spins around an imaginary line called its axis in 24 hours, providing us with days. I can explain how the rotation of the Earth causes day and night. I can demonstrate that the Earth takes one year to completely orbit the Sun. I can demonstrate that the tilt of the Earth on its axis as it circles the sun causes seasons. I can explain that the number of daylight hours changes with the seasons. I can explain states that the Moon is a large rock which orbits the Earth approximately every 28 days (a lunar month). I can record, observe and explain why the Moon appears to have different shapes and positions in the sky at different times. I can record and observe that the sun changes position during the day and gives reasons for shadows changing.</p>	<p>a I can describe the function of the skeleton. I can identify and locate the skull, spine, ribcage, femur, tibia, humerus and ulna using a model I have made. I can identify and locate major organs in the body including brain, heart, lungs, stomach & bladder. I can describe what my major organs do. I can understand the role of my skin as an organ. I can demonstrate aspects of a healthy lifestyle including a balanced diet, exercise, sleep and avoiding substance misuse.</p> <p>b I can use my senses to detect information from the world around me including dangers, hazards, smells etc. I can explain how our senses help to keep us safe (e.g. touch– hot cookers, sight – traffic, smell – burning etc.). I can be investigate the limitations of my senses and discuss how they work together.</p>
National Benchmarks	<p>a Explains the difference between living and non-living things, taking into consideration movement, reproduction, sensitivity, growth, excretion and feeding. Creates criteria for sorting living things and justifies decisions. Sorts living things into plant, animal and other groups using a variety of features.</p> <p>b Demonstrates awareness of how energy from the sun can be taken in by plants to provide the major source of food for all living things. Interprets and constructs a simple food chain, using vocabulary such as 'producer', 'consumer', 'predator' and 'prey'.</p> <p>c Observes, collects and measures the outcomes from growing plants in different conditions, for example, by varying levels of light, water, air, soil/nutrients and heat. Structures a presentation or report, with support, to present findings on how plants grow.</p>	<p>a Uses components to make simple models of a skeleton which identify the skull, spine, ribcage and some bones of the arms and leg and which show how the skeleton gives us support and protects our organs. Describes the position and function of major organs including the brain, heart, lungs, stomach and bladder. Describes how skin, as an organ, provides a barrier to infection and helps to control our temperature. Structures a presentation or report, with support, on how to have a healthy lifestyle, for example, through a balanced diet, regular exercise, sufficient sleep and by avoiding substance misuse.</p> <p>b Uses their senses to detect information and explains how they help to keep people safe. Investigates the reliability and limitations of the senses, for example, using taste tests, limits of sound, optical illusions and blind-fold games.</p> <p>c Describes the symptoms of some common diseases including colds, mumps, measles, chicken pox and flu. Provides explanations, supported by evidence, of how some diseases spread and discusses ways in which some diseases can be prevented through good hygiene and vaccination.</p>

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d	Identifies and talks about types of energy that we get from different energy sources, for example, light, sound, heat and electrical. Uses knowledge of different energy sources, for example, sun, food, fuel, wind and waves, to discuss the importance of different types of energy for everyday life and survival.	d	Uses their own experiences to illustrate how inherited characteristics are passed from one generation to the next. Knows that genetic information determines characteristics such as colour of eyes and shape of petals. Demonstrates understanding of the variations within family groups.
e	Uses more complex vocabulary to describe changes of states of water, for example, 'condensation' and 'evaporation'. Contributes to the design of an experiment to determine the temperature at which water boils, freezes and melts, ensuring appropriate use of units. Knows that pure water boils at 100°, melts at 0° and freezes at 0°.		
f	Describes how the Earth spins around its axis in 24 hours resulting in day and night. Observes and records the different patterns of movement of the moon and explains why the moon appears to have different shapes and positions in the sky at different times in a lunar month. Demonstrates understanding of how the Earth takes one year to completely orbit the sun. Demonstrates understanding of how the tilt of the Earth on its axis as it circles the sun causes the pattern of the seasons and changes to the number of daylight hours over the course of a year.		

Organiser	Forces, Waves and Electricity		Materials
Experiences and Outcomes	<p>By investigating forces on toys and other objects, I can predict the effect on the shape or motion of objects. SCN 1-07a</p> <p>By exploring the forces exerted by magnets on other magnets and magnetic materials, I can contribute to the design of a game. SCN 1-08a</p> <p>I can describe an electrical circuit as a continuous loop of conducting materials. I can combine simple components in a series circuit to make a game or model. SCN 1-09a</p> <p>By collaborating in experiments on different ways of producing sound from vibrations, I can demonstrate how to change the pitch of the sound. SCN 1-11a</p>		<p>Through exploring properties and sources of materials, I can choose appropriate materials to solve practical challenges. SCN 1-15a</p> <p>I can make and test predictions about solids dissolving in water and can relate my findings to the world around me. SCN 1-16a</p>
On track in P2			<p>a</p> <p>I can explain that a natural material was once a living thing. I can explain a synthetic material is man-made. I can describe materials using terms such as rough, flexible, waterproof etc. I can evaluate the suitability of the material for its purpose.</p> <p>b</p> <p>I can explain the terms soluble, insoluble, solution and mixture. I can explain the difference between a soluble and an insoluble material, and between a mixture and a solution. I can predict and investigate which materials dissolve and which do not using real life examples. I can investigate familiar materials in the world around me and define them as soluble or insoluble, a mixture or a solution. I can safely carry out investigations using a heat source and record the results. I can speed up or slow down the rate of solubility using stirring.</p>
On track in P3	<p>a</p> <p>I can predict and investigate pushing, pulling, stretching, squashing and twisting. I can demonstrate understanding of how a force can make an object change speed, direction or shape. I can investigate balanced forces and can explain that if a push and pull are equal then there is no change in movement. I can investigate how shape is linked to motion and stability.</p> <p>b</p> <p>I can plan and carry out simple investigations to demonstrate that magnets exert a non-contact force on each other and attract certain materials. I can explain that magnets have a north and south pole. I can explain the pushing and pulling effects of magnets using the terms 'attract' and 'repel'. I can explain that like poles repel and opposite poles attract. I can describe uses of magnets in everyday life. I can apply knowledge of magnets to create a game with others.</p>		
On track in P4	<p>c</p> <p>I can explain that an electrical circuit is a continuous loop of conducting material containing a power source. I can explain that electric current flows from one terminal of a power source to another. I can create simple circuits containing bulbs, switches, bells and batteries.</p>		

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		I can explain that switches can be used to start and stop flow of electrical current. I can identify a variety of materials correctly as 'insulators' or 'conductors'. I can create a game or model by combining simple components in a series circuit.		
	d	I can collaborate with others to investigate different ways of producing sound from vibrations. I can explain that sound is caused by a vibration in a material. I can demonstrate how sounds can be made higher or lower pitch by altering tightness, length, width or thickness or other physical characteristics of the sound source.		
National Benchmarks	a	Predicts and then investigates how a force can make an object change speed, direction or shape, and uses vocabulary such as pushing, pulling, stretching, squashing and twisting to describe forces. Investigates balanced forces and explains that if a push and pull are equal in strength and opposite in direction then there is no change in movement.	a	Classifies materials into natural and human-made (synthetic). Identifies properties of different materials, for example, rigidity, flexibility, rough, smooth and waterproof, and their uses linked to their properties.
	b	Reports in writing, visually, orally how magnets exert a non-contact force on each other and attract certain materials. Demonstrates through practical activities that like poles repel and opposite poles attract. Gives at least two examples for how magnets are used in everyday life.		
	c	Builds simple circuits containing bulbs, switches, bells and batteries.	b	Links new knowledge of dissolving to real-life examples of things that dissolve and things that don't dissolve. Predicts, investigates and records how solubility is affected by heat and stirring.
	d	Demonstrates how sounds can be made higher or lower pitch by altering tightness, length, width or thickness or other physical characteristics of the sound source. Explains that sound is caused by a vibration in a material.		

Skills (Cross Cutting across all Es and Os)				
	Inquiry and investigative skills	Scientific analytical thinking skills	Skills and attributes of scientifically literate citizens	Topical Sciences
National Benchmarks	Plans and designs scientific investigations and enquiries Collaborates with others to identify questions to find out more about a specific scientific concept, idea or issue.	Applies learning in the sciences. Provides creative solutions to scientific issues and problems.	Expresses informed views of scientific issues, both orally and in writing, and respects the views of others.	Discusses and expresses opinions about science topics in real-life contexts, including those featured in the media.

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	<p>Makes predictions about the scientific investigation/enquiry being planned. Contributes to the design of procedures for carrying out scientific investigations.</p> <p>Carries out practical activities in a variety of learning environments Identifies risks and hazards and ensures safe use of all tools, equipment and procedures. Collaborates to undertake investigations. Observes and collects information and makes measurements using appropriate equipment and units. Analyses, interprets and evaluates scientific findings Records and presents data/information using a range of methods including tables, charts and diagrams, using labelling and scales. Organises data and information and identifies significant patterns and relationships. Interprets findings and discusses links to the original question. Reports on limitations of their investigation and possible improvements. Relates findings to their wider experiences of the world around them. Identifies and discusses additional knowledge or understanding gained. Presents scientific findings Presents data/information using a range of methods including tables, charts and diagrams, using labels and scales. Reports in writing, orally or visually using a variety of media. Structures a presentation or report, with support, to present findings in a coherent and logical way.</p>	<p>Contributes to the design processes and uses components to make models.</p> <p>Demonstrates reasoning skills and draws on understanding of science concepts to make and test predictions.</p> <p>Provides explanations which are supported by evidence.</p>	<p>Makes connections between science and their own health and wellbeing.</p> <p>Demonstrates awareness of their own impact on the world.</p> <p>Demonstrates awareness of how people use science in their everyday lives and in a variety of jobs and careers.</p> <p>Discusses science topics in real-life contexts including those appearing in the media.</p>	<p>Discusses how people use science in their everyday lives.</p> <p>Describes a variety of jobs and careers which require scientific knowledge and skills</p>
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