Year 5 Science Curriculum

Topics

1. Living Things
2. Animals Inc. Humans
3. Materials
4. Earth and Space
5. Forces

Key

Observing over time
Identifying and classifying
Pattern seeking
Research from a secondary source
Fair testing

Cross curricular

Websites

Explorify – www.explorify.wellcome.ac.uk

TigTag – www.tigtagworld.co.uk

Y5 Living things and their habitats

1. describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
2. describe the life process of reproduction in some plants and animals

	Assessment guidance	Key learning	Possible 'I can' statements
SECURE	Shows understanding of a concept using scientific vocabulary correctly	• As part of their life cycle plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals including humans have offspring which grow into adults. In humans and some animals these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. • Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects. **Key vocabulary** Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings	I can draw the life cycle of a range of animals, identifying similarities and differences between the life cycles. I can explain the difference between sexual and asexual reproduction and give examples of how plants reproduce in both ways
	Applying knowledge in familiar related contexts, including a range of enquiries	• Compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth • Look for patterns between the size of an animal and its expected life span • Grow and observe plants that reproduce asexually e.g. strawberries, spider plant, potatoes • Plant bulbs and then harvest to see how they multiply	I can identify patterns in the life cycles of different animals. I can group living things into those which reproduce asexually and those which reproduce sexually. I can use secondary sources and, where possible, first hand observations to find out about the life cycle of a range of animals. I can use secondary sources to find out about pollination. I can write a chronological report on the life cycle of a ……

Y5 Animals, including humans (this builds on the learning in Living things and their habitat)

1. describe the changes as humans develop to old age

	Assessment guidance	Key learning	Possible 'I can' statements
SECURE	Shows understanding of a concept using scientific vocabulary correctly	When babies are young they grow rapidly. They are very dependent on their parents. As they develop they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce. This needs to be taught alongside PSHE Useful guidance can be obtained at: http://www.ase.org.uk/news/aseviews/teaching-about-puberty/ http://www.ase.org.uk/documents/2016-joint-statement-on-reproduction/ **Key vocabulary** Puberty: the vocabulary to describe sexual characteristics	I can explain the changes that takes place in boys and girls during puberty. I can explain how a baby changes physically as it grows and also what it is able to do.
	Applying knowledge in familiar related contexts, including a range of enquiries	This unit is likely to be taught through direct instruction due to its sensitive nature	

Y5 Properties and changes of materials

1. compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
2. know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
3. use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
4. give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
5. demonstrate that dissolving, mixing and changes of state are reversible changes
6. explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda

	Assessment guidance	**Key learning**	**Possible 'I can' statements**
SECURE	Shows understanding of a concept using scientific vocabulary correctly	• Materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. • Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. • Mixtures can be separated by filtering, sieving and evaporation. • Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible. **Key vocabulary** Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve reversible/non-reversible change, burning, rusting, new material	I can use understanding of properties to explain everyday uses of materials. For example, how bricks, wood, glass and metals are used in buildings. I can explain what dissolving means, giving examples. I can name equipment used for filtering and sieving. I can use knowledge of liquids, gases and solids to suggest how materials can be recovered from solutions or mixtures by evaporation, filtering or sieving. I can describe some simple reversible and non-reversible changes to materials, giving examples.
	Applying knowledge in familiar related contexts, including a range of enquiries	Investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g. test waterproofness and thermal insulation to identify a suitable fabric for a coat Explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate Investigate rates of dissolving by carrying out comparative and fair test Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture Explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning Research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton)	I can carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced? I can group solids based on their observations when mixing them with water. I can give reasons for choice of equipment and methods to separate a given solution or mixture such as salt or sand in water. I can create a chart or table grouping/comparing everyday materials by different properties.

Y5 Earth and space

1. describe the movement of the Earth, and other planets, relative to the Sun in the solar system
2. describe the movement of the Moon relative to the Earth
3. describe the Sun, Earth and Moon as approximately spherical bodies
4. use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

	Assessment guidance	Key learning	Possible 'I can' statements
SECURE	Shows understanding of a concept using scientific vocabulary correctly	• **The Sun is a star.** It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits. Earth takes 365¼ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. • As Earth rotates half faces the Sun (here it is day) and half is facing away from the Sun (night). As the Earth rotates the Sun appears to move across the sky. • The Moon orbits the Earth. It takes about 28 days to complete its orbit. • The Sun, Earth and Moon are approximately spherical. **Key vocabulary** Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune) spherical, solar system, rotates, star, orbit, planets	I can create a voice over for a video clip or animation I can show using diagrams the movement of the Earth and Moon I can explain the movement of the Earth and Moon I can show using diagrams the rotation of the Earth and how this causes day and night I can explain what causes day and night
	Applying knowledge in familiar related contexts, including a range of enquiries	Use secondary sources to help create a model e.g. role play or **using balls**, to show the movement of the Earth around the Sun and the Moon around the Earth. Use secondary sources to help make a model to show why day and night occur Make first-hand observations of how shadows caused by the Sun change through the day Make a sundial Research time zones	I can demonstrate and explain verbally how day and night occur. I can explain evidence gathered about the position of shadows in term of the movement of the Earth. I can explain how a sundial works. I can explain verbally using a model why we have time zones. I can think of a way of describing how day and night occur. (PowerPoint, model etc) I can write a balanced argument on whether the Earth is flat or spherical.

Y5 Forces

1. explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
2. identify the effects of air resistance, water resistance and friction, that act between moving surfaces
3. recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect

	Assessment guidance	**Key learning**	**Possible 'I can' statements**
SECURE	Shows understanding of a concept using scientific vocabulary correctly	• A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall. • Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water or the air and water may be moving over a stationary object. • A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines. **Key vocabulary** Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	I can demonstrate the effect of gravity acting on an unsupported object. I can give examples of friction, water resistance and air resistance. I can give examples of when it is beneficial to have high or low friction, water resistance and air resistance. I can demonstrate how pulleys, levers and gears work.
	Applying knowledge in familiar related contexts, including a range	Investigate the effect of friction in a range of contexts e.g. trainers, bath mats, mats for a helter-skelter Investigate the effects of water resistance in a range of contexts e.g. dropping shapes through water, pulling shapes e.g. boats along the surface of water Investigate the effects of air resistance in a range of contexts e.g. parachutes, spinners, sails on boats	I can explain the results of their investigations in terms of the force, showing a good understanding that as the object tries to move through the water or air or across the surface, the particles in the water, air or on the surface slow it down. I can demonstrate clearly the effects of using levers, pulleys and gears.

	of enquiries	Explore how levers, pulleys and gears work Make a product that involves a lever, pulley or gear Create a timer that uses gravity to move a ball Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation	