

Autumn

Spring

Summer

Unit Summary

Earth and Space

In this unit of work pupils will be introduced to a model of the Sun and Earth that enables them to explain day and night. Pupils should learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). They should understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). Pupils should find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus. Pupils might work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.

Forces

In this unit of work pupils will explore falling objects and raise questions about the effects of air resistance. They should explore the effects of air resistance by observing how different objects. They should experience forces that make things begin to move, get faster or slow down. Pupils should explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. Pupils should explore the effects of levers, pulleys and simple machines on movement. Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. Pupils might work scientifically by: exploring falling paper cones or cup-cake cases and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.

Properties and Changes of Materials

In this unit of work pupils will build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. They should explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. Pupils might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.

Living things and their Habitats

In this unit of work pupils will observe life-cycle changes in a variety of living things. They should find out about the work of naturalists and animal behaviourists. Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. Pupils might work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting

Animals including Humans

In this unit of work pupils will investigate the stages in growth and development of humans. Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows. We also cover puberty in this unit alongside Healthy Minds

Important Scientists and Inventors

We will look at a range of scientists who have contributed to the development of scientific understanding in a significant way. We will focus on David Attenborough and Leonardo Da Vinci as well as other scientists and inventors from across history.

reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.

Year 5 Knowledge

Earth and Space

Pupils should be taught to:

- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- Describe the movement of the Moon relative to the Earth
- Describe the Sun, Earth and Moon as approximately spherical bodies
- Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Forces

Pupils should be taught to:

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Properties and Changes of Materials

Pupils should be taught to:

- 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
- Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- Demonstrate that dissolving, mixing and changes of state are reversible changes

Living Things and Their Habitats:

Pupils should be taught to:

- Explain the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- Describe the life process of reproduction in some plants and animals.

Animals, including Humans:

Pupils should be taught to:

- Describe the changes as humans develop to old age

		<ul style="list-style-type: none"> • 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 		
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Year 5 Scientific Enquiry Skills

Working Scientifically

Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

Ideas and Evidence in Science Pupils can describe how experimental evidence and creative thinking are combined to provide scientific explanations, that has changed over time	Asking Questions and Enquiry Pupils can form scientific questions for enquiry based on scientific ideas/concepts and recognise which can be investigated and those which are theoretical. Plan different types of enquiries to answer questions, including identifying and controlling variables.	Predicting and Hypothesising Pupils can hypothesise, giving a reason which considers scientific ideas and uses knowledge of a similar everyday experience applied it to a new situation, e.g. I think little bits of sugar dissolve faster than a sugar lump	Planning and Enquiry Pupils can decide on an appropriate way to collect data to answer a question and with guidance, create a clear plan which identifies the independent, dependent and control variables	Fair Testing Pupils can identify key variables to be considered and with teacher guidance, choose one independent variable to change, decide how to measure the effect (dependent variable) and which variables to control	Observing and Measuring Pupils can select apparatus for a range of tests and use effectively, making a series of systematic observations, measurements and comparisons. Recognise patterns and begin to repeat observations and measurements, offering simple explanations for any differences found
Investigating Pupils can set up practical enquiries and use results to begin to set up comparative and fair tests	Recording Results Pupils can record observations and measurements systematically, including the use of ICT. Can begin to choose the best method,	Presenting Results Pupils can, where appropriate, present data as bar charts and line graphs. Can construct bar and line graphs, selecting scale and labelling axes.	Drawing Conclusions Pupils can draw conclusions which are consistent with evidence and relate these to scientific knowledge and understanding. Can use	Reviewing the Test Pupils can evaluate the accuracy of tests and make practical suggestions about how working methods could be improved	

	e.g. scientific diagrams, classification keys, tables, bar and line graphs, repeated tests and averaging (mean)	Can begin to interpret and systematically explain patterns in data.	appropriate scientific language and conventions to communicate quantitative and qualitative data		
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