



Science overview – Year 5

Living things and their habitats	Properties and changes of materials	Properties and changes of materials (reversible changes)
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe 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 <p>Notes and Guidance (non-statutory): Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example plants in the vegetable garden or flower border, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants and sexual reproduction in animals.</p> <p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> 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 reasons for similarities & differences they might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic <p>Notes and Guidance (non-statutory): Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials and relating these to what they learnt about magnetism in Year 3 and about electricity in Year 4.</p> <p>Note: Pupils are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them.</p> <p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> carry out tests to answer questions such as ‘Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?’ 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 demonstrate that dissolving, mixing and changes of state are reversible changes <p>Notes and Guidance (non-statutory): Pupils should explore reversible changes including evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes.</p> <p>Key vocabulary: mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material</p> <p>Properties and changes of materials (Changes that form new materials – irreversible changes)</p> <p>Pupils should be taught to:</p> <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.



Science overview – Year 5

<ul style="list-style-type: none"> observe changes in an animal over a period of time comparing how different animals reproduce and grow <p>Key vocabulary: life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings</p>	<ul style="list-style-type: none"> compare materials in order to make a switch in a circuit. <p>Key vocabulary: thermal/electrical insulator/conductor, change of state</p>	<p>Notes and Guidance (non-statutory): 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. Note: Safety guidelines should be followed when burning materials.</p> <p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> observing and comparing the changes that take place, for example, when burning different materials or baking bread or cakes. researching and discussing how chemical changes have an impact on our lives, for example cooking, and discuss [research] the creative use of new materials such as polymers, super-sticky and super-thin materials. <p>reversible/non-reversible change, burning, rusting, new material</p>
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Animals including humans	Earth and space	Forces
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age <p>Notes and Guidance (non-statutory): Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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



Science overview – Year 5

Pupils might work scientifically by:

- researching the gestation periods other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.

Key vocabulary: puberty – the vocabulary to describe sexual characteristics

- use the idea of the Earth's rotation to explain day and night

Notes and Guidance (non-statutory):

Pupils should 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).

Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. 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

- recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Notes and Guidance (non-statutory):

Pupils should 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 such as parachutes and sycamore seeds fall. 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 such as 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 [exploring] a variety of parachutes and
- carrying out fair tests to determine which designs are the most effective.
- exploring resistance in water by making and testing boats of different shapes.
- design and make artefacts that use simple levers, pulleys, gears and/or springs and explore their effects.

Key vocabulary: force, gravity, Earth, air resistance, water resistance, friction,



Science overview – Year 5

	<p>Stonehenge might have been used as astronomical clocks.</p> <p>Key vocabulary: Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets</p>	<p>mechanisms, simple machines, levers, pulleys, gears</p>
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