

Science Skills and Knowledge

Year 3

Animals including humans

National Curriculum reference

Biology Strand

Knowledge

- Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need.
- Food contains a range of different nutrients that are needed by the body to stay healthy – carbohydrates including sugars, protein, vitamins, minerals, fibre, fat, sugars, water.
- A piece of food will often provide a range of nutrients.
- Humans and some other animals have skeletons and muscles which help them move and provide protection and support

Skills

- Has broadened their scientific view of the world around them through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living and non-living things and familiar environments and by beginning to develop ideas about functions, relationships and interactions.
- Asks their own questions about what they observe and is able to make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.
- Draws simple conclusions and uses some scientific language, to both and write about what they have found out.
- Reads and spells scientific vocabulary correctly and with confidence, using their growing word and spelling knowledge.

Key Vocabulary

Nutrition Carbohydrate Protein Fat Dairy Energy Carnivore Omnivore Herbivore Skeleton Bone Protect Ribs Organ Spine/ Backbone Internal External Vertebrates/ Invertebrates
Muscle Joints Fibrous Cartilaginous Synovial Flexible Smooth Cardiac Skeletal Contracts

Science Skills and Knowledge

Year 3

Forces

National Curriculum reference

Physics strand

Knowledge

- Knows that friction affects the way that things move on different surfaces
- Knows that some forces need contact between two objects, but magnetic forces can act at a distance
- Knows that magnets attract or repel each other and attract some materials and not others
- Knows and can describe magnets as having two poles
- Knows whether two magnets will attract or repel each other, depending on which poles are facing

Skills

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Key Vocabulary

Push Pull Force Material Friction Gravity Shape Direction Speed Motion Forcemeter/ Newton meter Magnet Magnetic poles Magnetic Attract Repel Metal Plastic Wood Distance

Science Skills and Knowledge

Year 3

Light

National Curriculum reference

Physics strand

Knowledge

- Knows that light is needed to see things and that dark is the absence of light.
- Knows that light is reflected from surfaces.
- Knows that light from the sun can be dangerous and that there are ways to protect the eyes.
- Knows that shadow are formed when the light from a light source is blocked by an opaque object.
- Knows and can explain some of the reasons why the size of shadows changes.
- Knows how the shadows of transparent, opaque and translucent materials vary.

Skills

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Key Vocabulary

Light Dark Reflect Natural light source Absence Illumination Man-made Non-light sources Reflective material Surface Eye Dangerous Emit Shadow Translucent Transparent Opaque Wood Distance

Science Skills and Knowledge

Year 3

Rocks

National Curriculum reference

Chemistry strand

Knowledge

- Rock is a naturally occurring material.
- There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties.
- Rocks can be hard or soft. They have different sizes of grain or crystal.
- Rocks can be different shapes and sizes (stones, pebbles, boulders) and some absorb water.
- Knows, in simple terms, how fossils are formed when things that have lived are trapped within rock.
- Knows that soils are made from rocks and organic matter

Skills

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Key Vocabulary

Rocks Chalk Marble Physical properties Texture Crystals Pedologist Metamorphic Igneous Sedimentary Lava Permeable/impermeable Characteristics Fossil Construction Minerals Soil Micro-organisms Texture Grains Organic matter

Science Skills and Knowledge

Year 3

Living Things and their Habitats

National Curriculum reference

Biology Strand

Knowledge

- Knows and can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.
- Knows the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.
- Knows through investigation, the ways in which water is transported within plants
- Knows the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Skills

- Has broadened their scientific view of the world around them through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living and non-living things and familiar environments and by beginning to develop ideas about functions, relationships and interactions.
- Asks their own questions about what they observe and is able to make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.
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Key Vocabulary

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Science Skills and Knowledge

Year 4

Animals including Humans

National Curriculum reference

Biology Strand

Knowledge

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- Knows through investigation, the ways in which water is transported within plants
- Knows the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Skills

- Asks relevant questions and use different types of scientific enquiries to answer them.
- Sets up simple practical enquiries, comparative and fair tests.
- Makes systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- Gathers, records, classifies and presents data in a variety of ways to help in answering questions.
- Records findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- Reports on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Uses results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- Identifies differences, similarities or changes related to simple scientific ideas and processes.
- Use straightforward scientific evidence to answer questions or to support their findings

Key Vocabulary

Energy Carnivore Omnivore Herbivore Food chain Prey Predator Producer Consumer Molars Incisors Canines Carnivore Herbivore Mouth - tongue, oesophagus, stomach, small and large intestine, digestion

Science Skills and Knowledge

Year 4

Sound

National Curriculum reference

Physics strand

Knowledge

- Knows how sounds are made, associating some of them with vibrating.
- Knows how sound travels from a source to our ears.
- Knows the correlation between pitch and the object.
- Knows the correlation between the volume of a sound and the strength of the vibrations that produced it.
- Know that sounds get fainter as the distance from the sound source increases.
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Key Vocabulary

Sound Vibration Instrument Loud Quiet Volume Distance High Low Pitch Material Insulate Protective

Science Skills and Knowledge

Year 4

States of Matter

National Curriculum reference

Chemistry strand

Knowledge

- Knows how to distinguish between a solid, liquid and gas.
- Knows that some materials change state when they are heated or cooled.
- Knows the temperatures at which ice, water and water vapour change state.
- Knows the part played by evaporation and condensation in the water cycle.

Skills

- Asks relevant questions and use different types of scientific enquiries to answer them.
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Key Vocabulary

Material Solid Liquid Gas Temperature Melting point Boil Freeze Thermometer Cooling Melting Evaporation Condensation Water cycle Water vapour Precipitation

Science Skills and Knowledge

Year 4

Electricity

National Curriculum reference

Physics Strand

Knowledge

- Can identify and name appliances that require electricity to function.
- Knows the basic parts of a circuit, including cells, wires, bulbs, switches and buzzers.
- Knows that for an appliance to work within a circuit, it has to be part of a complete loop with a battery.
- Knows that a switch in a circuit is a temporary break in an otherwise 'complete circuit'.
- All metals conduct electricity but some, such as aluminium and titanium, are relatively poor conductors.
- Knows the recognised symbols used to represent components of a circuit and uses these to represent a circuit pictorially.

Skills

- Asks relevant questions and use different types of scientific enquiries to answer them.
- Sets up simple practical enquiries, comparative and fair tests.
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Key Vocabulary

Electricity Mains Battery Power station Appliance Conductor Insulator Plug Socket Switches Cell Wire Bulb, Motor Buzzer Circuit Complete circuit

Science Skills and Knowledge

Year 4

Living Things and their Habitats

National Curriculum reference

Biology Strand

Knowledge

- Can identify and name appliances that require electricity to function.
- Knows the basic parts of a circuit, including cells, wires, bulbs, switches and buzzers.
- Knows that for an appliance to work within a circuit, it has to be part of a complete loop with a battery.
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Key Vocabulary

Animals Plants Classifying Classification key Vertebrate Invertebrate Mammal Bird Insect Reptile Amphibian Fish Habitat Environment Deforestation

Science Skills and Knowledge

Year 5

Animals including Humans

National Curriculum reference

Biology Strand

Knowledge

- Knows and can describe the differences between sexual and asexual reproduction.
- Knows and can describe the differences in the life cycles of a human and some animals.
- Knows and can describe the life processes of human reproduction.
- Can identify and name the main parts of the human reproductive organs.
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Skills

- Plans different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Takes measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Records data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- Reports and presents findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
- Uses test results to make predictions to set up further comparative and fair tests.
- Identifies scientific evidence that has been used to.

Key Vocabulary

Life cycle Gestation Infancy Childhood Adolescence Puberty Hormones Brain Muscles Bones Life expectancy

Science Skills and Knowledge

Year 5

Forces

National Curriculum reference

Physics Strand

Knowledge

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

Skills

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Key Vocabulary

Force Forcemeter/ Newtonmeter Gravity Weight Friction Air resistance Surface Area Streamline Water resistance Amphibians

Science Skills and Knowledge

Year 5

Earth and Space

National Curriculum reference

Physics Strand

Knowledge

- 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.

Skills

- Plans different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
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Key Vocabulary

Solar System Lunar Solar Eclipse Spherical Orbit Axis Rotate Crescent Gibbous Heliocentric Geocentric

Science Skills and Knowledge

Year 5

Properties of Materials

National Curriculum reference

Chemistry Strand

Knowledge

- 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.
-

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Key Vocabulary

Material Properties Dissolve Solution Reversible Irreversible Melting point Crystallise Sieving Filtering Material Properties Flammable

Science Skills and Knowledge

Year 5

Living things and their Habitat

National Curriculum reference

Biology Strand

Knowledge

- Knows and can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- Knows and can describe the life processes of reproduction in some plants (including the pollination process) and animals
- Knows that bulbs, tubers, runners and plantlets are examples of plant reproduction involving only one parent

Skills

- Plans different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
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Key Vocabulary

Petals Stem Anther Ovule Ovary Filament Pollen Tube Style Reproduction Asexual Sexual Pollination Mammal Life cycle Gestation Amphibians

Science Skills and Knowledge

Year 6

Animals including Humans

National Curriculum reference

Biology Strand

Knowledge

- Can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
- Recognise the impact of diet, exercise, drugs and lifestyle on the way the body functions.
- Knows and can describe the way in which nutrients and water are transported within animals, including humans.

Skills

- Plans different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
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Key Vocabulary

Carbohydrate Fat Vitamins Nutrients Fibre Veins Heart Lungs Circulatory system Arteries Oxygenated Deoxygenated Contract Capillaries Exercise
Fibre Pulse Relax
Beneficial Harmful Blood vessels

Science Skills and Knowledge

Year 6

Evolution and Inheritance

National Curriculum reference

Biology Strand

Knowledge

- All living things have offspring of the same kind. The offspring are not identical to their parents and vary.
- Plants and animals have characteristics that make them suited (adapted) to their environment.
- If the environment changes rapidly some variations may not suit the new environment and will die. If it changes slowly, animals and plants with
- Variations that are best suited survive and reproduce.
- Over a very long period of time these characteristics may be so different that a new species is created. This is evolution.
- Fossils give us evidence of what lived on the Earth millions of years ago scientists such as Darwin and Wallace observed how living things adapt to different environments.

Skills

- Plans different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
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Key Vocabulary

Science Skills and Knowledge

Adaptation Inheritance Habitat Environment Evolution Organisms Genes Reproduce Species Offspring Variation Acquired Characteristics Extinct
Breeding Fossil Climate

Year 6

Light

National Curriculum reference

Physics Strand

Knowledge

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Key Vocabulary

Light Shadow Reflect Translucent Transparent Opaque Shadow Light source Artificial light Natural light Shadow patterns

Science Skills and Knowledge

Year 6

Electricity

National Curriculum reference

Physics Strand

Knowledge

- That the brightness of a bulb, or the volume of a buzzer, correlates with the voltage of cells used in the circuit.
- Knows and can give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- Knows the effect of adding more components to a circuit with one cell and the effect of adding multiple cells
- Knows and can use the recognised symbols to represent a simple circuit in a diagram

Skills

- Plans different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
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Key Vocabulary

Electricity Mains Battery Cell Wire Switch Bulb Motor Buzzer Circuit Conductor Insulator Component Components

Science Skills and Knowledge

Year 6

Living Things and their Habitats

National Curriculum reference

Biology Strand

Knowledge

- Plants can be divided broadly into two main groups – flowering plants and nonflowering plants.
- Living things can be formally grouped according to characteristics.
- Animals can be divided into two main groups – vertebrates and invertebrates.
- Each group has common characteristics.

Skills

- Plans different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
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Key Vocabulary

Science Skills and Knowledge

Animals Plants Micro-organism Bacteria Viruses Fungi Algae Protozoa Vertebrate Invertebrate Classify Classification Characteristics Bacteria Fungi Pathogen
