Science in Year 3

Light – Autumn 1
(Lights, shadows and reflections)

National Curriculum statutory requirements:

- recognise that they need light in order to see things and that dark is the absence of light
- notice that light is reflected from surfaces
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- recognise that shadows are formed when the light from a light source is blocked by an opaque object
- find patterns in the way that the size of shadows change.

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

Working scientifically statutory requirements:

5 types of scientific enquiry: Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing.
-Ask relevant questions and use different types of scientific enquiries to answer them.
-setup simple practical enquiries, comparative and fair tests.
-make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
-gather, record, classify and present data in a variety of ways to help in answering questions.
-recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
-Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
-Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
-identify differences, similarities or changes related to simple scientific ideas and processes.
-use straightforward scientific evidence to answer questions or to support their findings.

Notes and guidance (non-statutory)
Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change.
Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.
Pupils might work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.

Vocabulary
Light source dark absence reflect reflective fluorescent cats-eyes sunlight The Sun bounce glare travel shadow opaque transparent translucent block cast length width height strength darker lighter fainter brighter partial materials shiny sunglasses shade shield

Science in Year 3

Forces and Magnets – Autumn 2

National Curriculum statutory requirements:

- compare how things move on different surfaces
- notice that some forces need contact between two objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having two poles
- predict whether two magnets will attract or repel each other, depending on which poles are facing.

Working scientifically statutory objectives:

-Ask relevant questions and use different types of scientific enquiries to answer them.
-setup simple practical enquiries, comparative and fair tests.
-make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
-gather, record, classify and present data in a variety of ways to help in answering questions.
-recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
-Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
-Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
-identifying differences, similarities or changes related to simple scientific ideas and processes.
-use straightforward scientific evidence to answer questions or to support findings.
5 types of scientific enquiry: Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing.

Notes and guidance (non-statutory)
Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe).
Pupils might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.

Vocabulary
Magnetic non-magnetic **metals:** copper, steel, iron, aluminium, lead, stainless steel, gold, bronze, tin. attract repel magnetic North North pole atmosphere magnetic compass needle electromagnetism MRI scanner surface area bar magnet horse shoe magnet ring magnet button magnet u shape magnet cylindrical magnet

Science in Year 3

Animals including humans - Spring 1
(Nutrition & Skeletal System)

National Curriculum statutory requirements:

-identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat
-identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Working scientifically objectives:

-ask relevant questions and using different types of scientific enquiries to answer them.
-setup simple practical enquiries, comparative and fair tests.
-make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
-gather, record, classify and present data in a variety of ways to help in answering questions.
-record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
-Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
-Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
-identify differences, similarities or changes related to simple scientific ideas and processes.
-use straightforward scientific evidence to answer questions or to support their findings.
5 types of scientific enquiry: Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing.

Notes and guidance (non-statutory)
Pupils should continue to learn about the importance of nutrition and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions.
Pupils might work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons.
They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat.
They might research different food groups and how they keep us healthy and design meals based on what they find out.

Vocabulary
Skeleton support protection spine attach muscles movement skull femur cranium jaw collar bone fibula tibia ankle knee humorous ulna radius nutrition nutrients health healthy food groups fat water vitamins minerals protein carbohydrates
omnivore carnivore herbivore nutrition diets dietary needs meat eater plants

Science in Year 3

Plants - Spring 2

(Life, growth and functions)

National Curriuclum statutory requirements:

- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.
- explore 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.
- investigate the way in which water is transported within plants.
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Working scientifically statutory requirements:

-ask relevant questions and using different types of scientific enquiries to answer them.
-setup simple practical enquiries, comparative and fair tests.
-make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
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-use straightforward scientific evidence to answer questions or to support their findings.
5 types of scientific enquiry: Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing.

Notes and guidance (non-statutory)

Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction.
Note: Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens.
Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.

Vocabulary
Plants vegetables flowering plants trees bushes nutrients water sunlight photosynthesis stem roots leaves flowers transported absorb support anchor growth healthy oxygen room space

Science in Year 3

Rocks, Fossils & Soils – Summer 1

National Curriculum statutory requirements:

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
- Describe in simple terms how fossils are formed when things that have lived are trapped within rock.

Working scientifically statutory requirements:

-Ask relevant questions and using different types of scientific enquiries to answer them.
-setup simple practical enquiries, comparative and fair tests.
-make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
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-identify differences, similarities or changes related to simple scientific ideas and processes.
-use straightforward scientific evidence to answer questions or to support their findings.
5 types of scientific enquiry: Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing.

Notes and guidance (non-statutory)
Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.
Pupils might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed.

Vocabulary
igneous metamorphic sedimentary permeable impermeable manmade natural fossils weathering pressure texture trace fossils body fossils preserved

Science in Year 3

Rocks, Fossils & Soils – Summer 2

National Curriculum statutory requirements:

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
- Describe in simple terms how fossils are formed when things that have lived are trapped within rock.
- Recognise that soils are made from rocks and organic matter.

Working scientifically statutory requirements:

-ask relevant questions and using different types of scientific enquiries to answer them.
-setup simple practical enquiries, comparative and fair tests.
-make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
-gather, record, classify and present data in a variety of ways to help in answering questions.
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Vocabulary

weathering formed organic matter sieve components sandy soil loam soil clay soil rotted plant contents particles lighter heavier discoloured texture grains smoother silkier fine soapy sticky manipulate properties permeability filter paper cotton wool funnel variable rapid moderate