

The Priestley Progress Path

Science



Placing learning at the heart of everything we do.

Working Scientifically



Biology



Living things & Habitats
Animals, inc. Humans
Evolution & Inheritance
Plants

Chemistry

Properties & changes of materials
Rocks
Everyday Materials
States of Matter



Physics

Forces & Magnets
Sound
Seasonal Changes
Light
Earth & Space
Electricity



Intent

Raising Aspiration, Realising Ambition, Stimulating Curiosity.

Our aim is to provide our children with an engaging, exciting and empowering science curriculum that develops curiosity and love for discovering how the world around us works and equips them for both today and tomorrow. The science curriculum is designed to: recognise children's prior learning, provide first-hand learning experiences, allow the children to develop interpersonal skills, such as cooperation and sharing great ideas, build resilience through staying focused and taking responsibility and become aspirational, creative, critical thinkers by thinking things through and giving it a go. Throughout the science curriculum we reflect on our Priestley Values in order to learn like Spikey, to promote positive attitudes to science learning which reflect the values and skills needed to promote responsibility for learning, respect for others and future success.

Implementation

Placing learning at the heart of everything we do.

We use the Cornerstones Primary Curriculum to teach science using a topic-based approach. By the end of the children's primary education, they will be able to:

- plan and carry out scientific investigations both individually and as a group.*
- make predictions backed up by their own scientific understanding.*
- use a wide range of equipment to make accurate measurements.*
- use their observations and knowledge to answer scientific questions.*
- develop a respect for the materials and equipment they handle with regard to their own and other children's safety.*
- use a range of methods to communicate scientific information and present it in a systematic, scientific manner, including ICT, diagrams, graphs and charts.*

Impact

Priestley and Proud

The impact of the school's curriculum will be constantly evaluated as we place learning at the heart of everything we do. We use a variety of strategies to evaluate the knowledge, skills and understanding that our children have gained in each unit:

- CPD to ensure that teacher pedagogy and assessment is secure.*
- regular feedback, marking and pupil voice feedback.*
- subject monitoring, including book looks & planning peeks.*
- regular low stakes knowledge assessments, using a range of creative approaches.*



1. Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions.
2. Make comments about what they have heard and ask questions to clarify their understanding.
3. Hold conversation when engaged in back-and-forth exchanges with their teacher and peers.

Communication & Language

Listening, Communication & Attention

Communication & Language

Speaking

1. Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary.
2. Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate.
3. Express their ideas and feelings about their experiences using full sentences, including use of past, present and future tenses and making use of conjunctions, with modelling and support from their teacher.



The Natural World

1. Explore the natural world around them, making observations and drawing pictures of animals and plants.
2. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
3. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

An EYFS Scientist

Will be able to:

1. Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps.

People, Culture & Communities



Do you want to be friends?



Will you read me a story?



What happens when I fall asleep?



Are we there yet?



Why do ladybirds have spots?



Why don't snakes have legs?



Who lives in a rock pool?



What can you see in summer?



A Year One Scientist

Will be able to:

Working Scientifically

1. ask simple questions.
2. observe closely, using simple equipment e.g. a magnifying glass
3. perform simple tests.
4. make simple groupings.
5. gather and record simple data.
6. suggest what has been found out.



Chemistry

Everyday Materials

1. distinguish between an object and the material from which it is made.
2. name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
3. describe the simple physical properties of a variety of everyday materials.
4. compare and group together a variety of everyday materials on the basis of their simple physical properties e.g. metals or fabrics.



Physics

Seasonal Change

1. observe changes across the 4 seasons.
2. observe and describe weather associated with the seasons and how day length varies.



Biology

Plants

1. identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
2. identify and describe the basic structure of a variety of common flowering plants, including trees.
3. identify and label the roots, leaves, stem and petals of a plant.
4. identify and label the roots, trunk, branches and leaves of a tree.

Animals including Humans

1. identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.
2. identify and name a variety of common animals that are carnivores, herbivores and omnivores.
3. describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)
4. identify, name, draw and label the basic parts of the human body, such as eye, ear, nose, arm leg.
5. say which part of the body is associated with each sense.
6. recognise things that are living or dead
7. explain the basic stages of a life-cycle of an animal/plant.





A Year Two Scientist

Will be able to:

Working Scientifically

1. ask simple questions and recognise that they can be answered in different ways.
2. identify and classify into groups using scientific knowledge.
3. use their observations and ideas to suggest answers to questions.
4. gather and record data to help in answering questions.

Chemistry

Everyday Materials

1. identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
2. investigate how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Physics

Seasonal Change

1. suggest the type of weather we get in each season.

Biology

Plants

1. observe and describe how seeds and bulbs grow into mature plants.
2. find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Living things and their Habitats

3. explore and compare the differences between things that are living, dead, and things that have never been alive.
4. identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.
5. identify and name a variety of plants and animals in their habitats, including microhabitats.
6. describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Animals including Humans

7. notice that animals, including humans, have offspring which grow into adults.
8. find out about and describe the basic needs of animals, including humans, for survival e.g. water, food and air
9. describe the importance for humans of exercise and rest, eating the right amounts of different types of food, and hygiene e.g. washing your hands and cleaning your teeth.





Year One Scientific Vocabulary

Working Scientifically

Find, sort, data, test

Biology – Plants

Wild, leaf, stem, root, seeds, bulb, grow, water, light

Biology – Living things/Habitats

Home, dead, live, food, needs

Biology – Animals including Humans

Fish, body, bones, birds, diet

Chemistry – Everyday Materials

Wood, metal, rock, hard, soft, glass, paper, push, pull

Physics – Seasonal Change

Hot, cold, wet, rain, cloud, sunny, fog, mist, snow



Year Two Scientific Vocabulary

Working Scientifically

Question, identify, equipment, source, group

Biology – Plants

Common, petal, trunk, branches, leaves, plants, healthy, light, flower

Biology – Living things/Habitats

Living, thing, object, habitat, alive, chain

Biology – Animals including Humans

Reptiles, amphibians, mammals, carnivore, omnivore, herbivore, humans, non-living, life-cycle, exercise, hygiene, clean, balanced

Chemistry – Everyday Materials

Object, material, plastic, glass, water, fabric, properties, rough, tough, smooth, rigid, flexible, bendy, cardboard, squashing, Pulling, pushing, bending, twisting, stretching

Physics – Seasonal Change

Seasons, change, weather, temperature, Spring, Summer, Winter, Autumn

KS1 Laboratory



Francis Beaufort

Agnes Arbor



Archimedes

Alan Titchmarsh



Steve Backshall

KS1 Scientists

Will know about these Scientists:

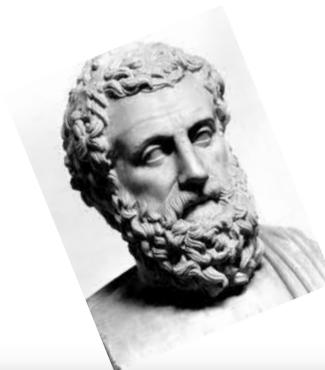


Rosalind Franklin



Sir John Wolfe Barry

Aristotle



Salvino D'Armarti



David Attenborough



Science Year 1 / 2



Year A

Biology



Who's Poo?



Why do we have teeth?



What is a bud?



Are all leaves the same?

Physics



How big is a raindrop?



How wild is the wind?



How do you make bread?



Why does a boat float?



Can you make a paper bridge?

Chemistry



Can you find treasure?



Which stuff is sticker?



What keeps us dry?



Science Year 1 / 2



Year B

Biology



What can our hands do?



What can you remember?



Why do we have two eyes?



How does grass grow?



How do plants grow in winter?



Do insects have a favourite colour?



What is the life cycle of a ladybird?



Why should I exercise?



How do germs spread?

Physics



How does it move?

Chemistry



Can you be a Superhero?



How does it feel?



A Year Three Scientist

Will be able to:



Biology

Plants

1. identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.
2. 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.

3. Living things/Habitats

4. recognise that living things can be grouped in a variety of ways.

5. Animals including Humans

- 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.
7. identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Working Scientifically

1. ask relevant questions and using different types of scientific enquiries to answer them.
2. set up simple practical enquiries, comparative and fair tests.
3. make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
4. gather, record, classify and present data in a variety of ways to help in answering questions.
5. record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
6. use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
7. identify differences, similarities or changes related to simple scientific ideas and processes.
8. use straightforward scientific evidence to answer questions or to support their findings.

Chemistry

Rocks

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

States of Matter

3. identify materials according to whether they are solid, liquid or gas.

Physics

Light

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

Sound

1. identify how sounds are made, associating some of them with something vibrating.

Forces/Magnets

1. compare how things move on different surfaces.
2. notice that some forces need contact between 2 objects, but magnetic forces can act at a distance.
3. observe how magnets attract or repel each other and attract some materials and not others.
4. 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.
5. describe magnets as having 2 poles.





A Year Four Scientist

Will be able to:

Physics

Light

1. find patterns in the way that the size of shadows change.

Sound

2. recognise that vibrations from sounds travel through a medium to the ear.
3. find patterns between the pitch of a sound and features of the object that produced it.
4. find patterns between the volume of a sound and the strength of the vibrations that produced it.
5. recognise that sounds get fainter as the distance from the sound source increases.

Forces/Magnets

6. predict whether 2 magnets will attract or repel each other, depending on which poles are facing.

Electricity

7. construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.
8. identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.
9. recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.
10. recognise some common conductors and insulators, and associate metals with being good conductors.

Working Scientifically

1. record findings using more complex scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
2. report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

Chemistry

Rocks

1. recognise that soils are made from rocks and organic matter.

States of Matter

1. compare and group materials together, according to whether they are solids, liquids or gases.
2. observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
3. identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Biology

Plants

1. investigate the way in which water is transported within plants.
2. explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Living things/Habitats

3. explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.
4. recognise that environments can change and that this can sometimes pose dangers to living things.

Animals including Humans

5. describe the simple functions of the basic parts of the digestive system in humans.
6. identify the different types of teeth in humans and their simple functions.
7. construct and interpret a variety of food chains, identifying producers, predators and prey.



Year Three Scientific Vocabulary

Working Scientifically

Biology – Plants

Biology – Living things/Habitats

Biology – Animals including Humans

Chemistry – Rocks

Chemistry – States of matter

Physics – Light

Physics – Sound

Physics – Forces & Magnets

Physics – Electricity

Classify, science, observe, findings, record, fair-test, method, results

Flowering, sepal, stigma, stamen, pollen

Classify, identify, group

Oxygen, skeleton, muscle, system, heart, lungs, kidneys, brain, teeth, prey

Rocks, soil, compost, decay, fossils

Solid, liquid, gases, heating, cooling, cycle

Lightness, darkness, reflect, shadow, sunlight

Sounds, waves, pitch, volume, vibrate

Surface, contact, attract, repel, magnet, force

Electric, series, cells, lamps, wires, bulbs, motors



Year Four Scientific Vocabulary



Working Scientifically

Biology – Plants

Biology – Living things/Habitats

Biology – Animals including Humans

Chemistry – Rocks

Chemistry – States of matter

Physics – Light

Physics – Sound

Physics – Forces & Magnets

Physics – Electricity

Scientific, observations, knowledge, investigate, thermometer, data loggers, accuracy, measurement, diagram, explanation, conclusion, prediction, similar, different

Transported, anther, filament, ovary, style

Endanger, environment, classification

Producers, predators, molars (pre-molars), incisors, canines, digestion, muscular, nutrition, nutrients

Physical, properties, sedimentary, igneous, fertiliser

Transparent, translucent, opaque, condensation, evaporation, Absorb

Absence, reflected, reflection, protected, mirror

Vibration

Attraction, magnetic

Circuit, appliance, electricity, parallel, buzzers, switches, function, conductor, insulator

Lower KS2 Laboratory



Sir Isaac Newton



David Bellamy



William Gilbert

Michael Faraday

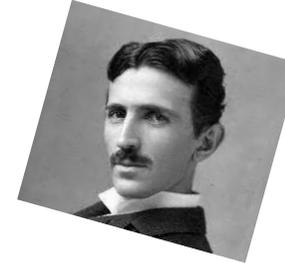


Alexander Fleming

Lower KS2 Scientists
Will know about these Scientists:



William Beaumont



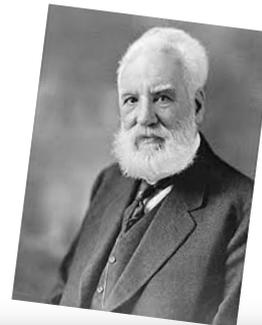
Nikola Tesla

Megan Balks



Justus Von Liebig

Alexander Graham Bell



Thomas Young



Bernard Palissy



Science Year 3 / 4



Year A

Biology



Do plants have legs?



What are flowers for?



Why are trees tall?



What is soil?



What do owls eat?



How do fossils form?

Physics



How mighty are magnets?



What does friction do?



How far can sound travel?



How can we change a sound?



How fast does water flow?

Chemistry



Why did Icarus fall from the sky?



Science Year 3 / 4



Year B

Biology



How does toothpaste protect teeth?



Where does water go?



Why does it flood?



What is spit for?

Physics



How do plugs work?



What conducts electricity?



Why do cat's eyes glow at night?



What are sunglasses for?

Chemistry



How did Vikings dye their clothes?



How do smells get up your nose?



Are all liquids runny?



A Year Five Scientist

Will be able to:

Biology

Evolution and inheritance

1. recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

Living things/Habitats

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

Animals including Humans

4. describe the changes as humans develop to old age.



Physics

Light

1. recognise that light appears to travel in straight lines.
2. use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.

Earth and Space

3. describe the movement of the Earth and other planets relative to the sun in the solar system.
4. describe the movement of the moon relative to the Earth.
5. describe the sun, Earth and moon as approximately spherical bodies.

Forces

6. explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
7. recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.

Electricity

8. associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.



Working Scientifically

1. plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
2. take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
3. record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.



Chemistry

Properties of Changing 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.



A Year Six Scientist

Will be able to:

Chemistry

Properties and Changing Materials

1. give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.
2. demonstrate that dissolving, mixing and changes of state are reversible changes.
3. 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.



Biology

Living things/Habitats

1. describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.
2. give reasons for classifying plants and animals based on specific characteristics.

Animals including Humans

3. identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
4. recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function.
5. describe the ways in which nutrients and water are transported within animals, including humans.

Evolution and inheritance

6. recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
7. identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.



Working Scientifically

1. use test results to make predictions to set up further comparative and fair tests.
2. report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.
3. identify scientific evidence that has been used to support or refute ideas or arguments.



Physics

Light

1. explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.
2. use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Earth and Space

1. use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Forces

1. identify the effects of air resistance, water resistance and friction, that act between moving surfaces.

Electricity

1. compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.
2. use recognised symbols when representing a simple circuit in a diagram.





Year Five Scientific Vocabulary

Working Scientifically

Biology – Plants

Biology – Living things/Habitats

Biology – Animals including Humans

Chemistry – Properties of changing materials

Chemistry – States of matter

Physics – Earth & Space

Physics – Forces

Physics – Electricity

Purpose, hypothesis, variable, accurately, scatter, theory, evidence

Evolution, inheritance, offspring, adapted

Reproduce, germination, dispersal

Life-style, vessels, chambers, valves, breathing

Formation, hardness, soluble, thermal, dissolve, solution, reversible, irreversible

Transparent, translucent, opaque, condensation, evaporation, absorb

Orbit, galaxy, solar, system, outer space

Gravity, gears, thrust, pulleys, levers, friction

Voltage

Year Six Scientific Vocabulary

Working Scientifically

Biology – Plants

Biology – Living things/Habitats

Biology – Animals including Humans

Chemistry – Properties of changing materials

Physics – Earth & Space

Physics – Light

Physics – Forces

Physics – Electricity

Precisely, classification, causal, relationship

Adaptation

Reproduction, characteristics

Arteries, capillaries, respiratory, circulatory, circulation, oxygenated, de oxygenated

Transparency, conductivity, filtration, solubility

Spherical

Magnify, optical, binoculars

Air resistance, water resistance, aerodynamic, streamlined

Components

Upper KS2 Laboratory



Maria Merian

Rosalind Franklin



Dian Fossey



Andrew Steele

Caroline Herschel



Sir Humphrey Davy

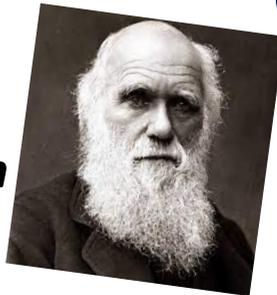
Upper KS2 Scientists

Will know about these Scientists:



Galileo

Charles Darwin

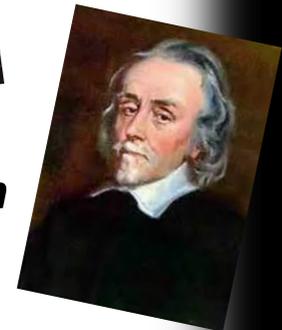


Carolus Linnaeus



Hertha Ayrton

William Harvey



Jabir ibn Hayyan



Thomas Edison



Science Year 5/6



Year A

Biology



How do worms reproduce?



Why do birds lay eggs?



What is the lifecycle of a mealworm?



Do we slow down as we get older?



Why are things classified?

Physics



How does the moon move?



How do rockets lift off?



Can you turn a light down?



Can fruit light a bulb?



Science Year 5/6

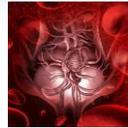


Year B

Biology



What is in blood?



How does blood flow?



How do animals stay warm?



How does inheritance work?



Why do birds have different beaks?

Physics



How does light travel?



Can you see through it?



Can we slow cooling down?



What colour is a shadow?

Chemistry



Can you clean dirty water?



Will it erupt?