Stokesley Primary Science Curriculum
Updated October 2024

Science Overview

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Autumn	Getting to know you Harvest Bears Celebrations and festivals	Plants Seasonal Changes	Plants Animals including humans	Light Rocks	Sound Animals including humans	Animals including humans Earth and Space	Light Electricity
Spring	Birds and Winter Feelings and Fantasy	Materials Animals including humans	Living things and their habitats	Forces and Magnets Plants	States of Matter Living things	Properties and changes of materials	Living things
Summer	Living things Under the sea Summer	Animals including humans	Use of Everyday Materials	Animals including humans	Electricity	Forces	Evolution and inheritance

Science in the Foundation Stage:

ELG: The Natural world
Children at the expected level of development will:
• Explore the natural world around them, making observations and drawing pictures of animals and plants;
• 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;
• Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

At Stokesley Primary Academy children are taught:
• How to develop a curiosity about the world around them;
• To care and respect the natural world;
• To observe and talk about change

Links to the National Curriculum	2 year olds learn to:	Nursery learn to:	Reception learn to:
Animals including humans **Plants**	▪ Repeat actions that have an effect. ▪ Explore materials with different properties. ▪ Explore and respond to different natural phenomena. ▪ Explore the natural world around them. ▪ Use all senses in hands on exploration of natural materials and through messy play.	▪ Use all senses in hands on exploration of natural materials. ▪ Explore collections of materials with similar and/or different properties. ▪ Talk about what they see, using a wide vocabulary. ▪ Understand simple questions about 'who', 'what' , 'where' and 'why'.	▪ Recognise, name and describe some plants and animals. ▪ Name body parts. ▪ Observe and draw pictures of the natural world, including animals and plants. ▪ Plant seeds and care for growing plants. ▪ Naming what plants need to survive. ▪ Understand the key features of the life cycle of a plant and an animal.

Links to the National Curriculum	2 year olds learn to:	Nursery children learn to:	Reception children learn to:
Living things and their habitats	▪ Describe what they see, hear and feel whilst outside. ▪ Understand simple questions about 'who', 'what' and 'where'. ▪ Listen to simple stories and understand what is happening, with the help of the pictures. ▪ Repeat words and phrases from familiar stories. Ask questions about the book. ▪ Makes comments and shares their own ideas.	▪ Describe what they see, hear and feel whilst outside. ▪ Enjoy listening to longer stories and can remember much of what happen. ▪ Know many rhymes and be able to talk about familiar books. ▪ Engage in extended conversations about stories, learning new vocabulary. ▪ Makes comments and shares their own ideas. ▪ Plant seeds and care for growing plants. ▪ Naming what plants need to survive. ▪ Begin to understand the need to respect and care for the natural environment and all living things. ▪ Explore how things work	▪ Begin to understand the need to respect and care for the natural world around us. ▪ Sing songs and join in with rhymes and poems about the natural world.
Seasonal changes			▪ Understand the effect of changing seasons on the natural world around them. ▪ Note and record the weather. ▪ Share stories and rhymes about the changing seasons. ▪ Observe how animals behave differently as the seasons change.
Everyday materials			▪ Touch smell and hear the natural world around them during hands-on experiences. ▪ Talk about the differences between materials and changes they notice. ▪ Observe and interact with natural processes, such as ice melting. ▪ Explore how things work
Sound			▪ Hear the natural world around them during ▪ hands-on experiences.
Forces		▪ Explores and talks about forces (Pushes and pulls)	▪ Explore and talk about different forces they can feel.

Substantive Knowledge: EYFS Nursery		
Explore how things work	**Begin to understand the need to respect and care for the natural environment and all living things**	**Explore and talk about different forces they can feel.**
• Let children explore a range of toys with moving parts, these may include wind up toys and battery operated toys. • Explore anything that has wheels. Look at toys, scooters and bicycles. • Let children explore using small wheeled vehicles moving on different surfaces, such as sand wood, etc. • Let children make up their own vehicles, etc. and add wheels to them. Let them understand more about how they can make things move on their own.	• Look at a number of plants growing in the natural environment, look at wild flowers but also trees. • Find out more about seeds by looking carefully at sunflowers and also fruit and isolate the seeds. • Plant the seeds in different materials including soil and talk about what they need to do to take care of the seed. • Consider what happens to eggs and caterpillars as they develop. Let them have first hand experiences of different growth cycles.	• Let children explore magnets with different materials and let them draw conclusions where applicable. • Let them find out more about the way they can make things move without touching them, for example blowing. • Look at the qualities of different materials such as fabric, wood, plastic, etc Let them explore which can bend stretch, etc. • Group materials according to certain attributes, e.g., materials that stretch, bend, move when in the wind, etc.

Substantive Knowledge: EYFS Reception		
Explore the natural world around them	**Describe what they see, hear and feel whilst outside**	**Understand the effect of changing seasons on the natural world around them**
• Appreciate that there are a number of creatures that share our planet with us. • Learn to look more closely at plants, animals and inspects that are around us. • Begin to notice certain patterns in the natural world, e.g., spider spinning a web, ice melting, sun going behind clouds. • Talk about and draw some of the natural phenoniums around them by observing and recording.	• Experience being out in the wind, rain and sun. Begin to talk about the experience of getting wet and feeling the wind. • Begin to recognise some of the potential hazards associated with the outside environment but also recognise its beauty. • Have the vocabulary to describe their experiences in much greater detail. • Begin to name some of the common plants and animals they see, including names of common birds.	• Notice that the weather changes very frequently and that they have to wear different clothing through the year. • Be able to contribute to a weather chart using appropriate symbols when doing so. • Know which season is the hottest in the year and which is the coldest. • Know the names of the seasons and be able to articulate what each season brings.

Substantive Knowledge: EYFS	
Nursery **End of year expectation**	**Reception** **End of year expectation**
The Natural World: • Able to comment and ask questions about aspects of their familiar world, such as the place where they live or the natural world; • Talking about some of the things they have observed such as plants, animals, natural and found objects; • Talking about why things happen and how things work; • Developing an understanding of growth, decay and changes over time; • Showing care and concern for living things and the environment.	**The Natural World:** • Explore the natural world around them, making observations and drawing pictures of animals and plants; • 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; • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter

EYFS Journey Towards the Early Learning Goal: The Natural World

End of Nursery	End of Autumn Term	End of Spring Term	End of Reception
Children should be working at a level which sees them:	Children should be working at a level which sees them:	Children should be working at a level which sees them:	Children working at the expected level will:
• Asking questions about aspects of their familiar world such as the place where they live or the natural world; • Talking about some of the things they have observed such as plants, animals, natural and found objects; • Talking about why things happen and how things work; • Starting to develop an understanding of growth, decay and changes over time; • Showing care and concern for living things and the environment	• Talking about some of the things they have observed such as plants, animals, natural and found objects; • Having greater awareness of seasonal change; • Asking questions about aspects of their familiar world such as the place where they live or the natural world; • Asking questions about some of the things they have observed such as plants and animals.	• Talking about why things happen and how things work; • Understanding more about growth, decay and changes over time; • Identifying features of living things, such as animals with legs or those with wings; • Exploring the natural world around them; • Describing what they see, hear and feel whilst outside; • Recognising some environments that are different to the one in which they live; • Understanding the effect of changing seasons on the natural world around them.	• Explore the natural world around them, making observations and drawing pictures of animals and plants; • 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; • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Substantive Knowledge: Year 1

Biology			Chemistry	Physics
Animals, including Humans	**Animals, including Humans**	**Plants**	**Everyday Materials**	**Seasonal Change**
• *Name common animals* • *Carnivores, etc*	• *Human body and senses*	• *Common plants* • *Plant structure*	• *Properties of materials* • *Grouping materials*	• *The four seasons* • *Seasonal weather*
• Know how to classify a range of animals by amphibian, reptile, mammal, fish and birds • Know and classify animals by what they eat (carnivore, herbivore and omnivore) • Know how to sort by living and non living things	• Know the name of parts of the human body that can be seen • Know which part of the body associated with each of the five senses.	• Know and name a variety of common wild and garden plants • Know and name the petals, stem, leaves and root of a plant • Know and name the roots, trunk, branches and leaves of a tree	• Know the name of the materials an object is made from • Know about the properties of everyday materials	• Name the seasons and know about the type of weather associated with each season • Know the main months associated with each season

Substantive Knowledge: Year 2

Biology			Chemistry	
All living things and their habitats	**Animals, including Humans**	**Plants**	**Everyday Materials**	
• *Alive or dead* • *Habitats* • *Adaptations* • *Food chains*	• *Animal reproduction* • *Healthy living* • *Basic needs*	• *Plant and seed growth* • *Plant reproduction* • *Keeping plants healthy*	• *Identify different materials* • *Name everyday materials* • *Properties of materials*	• *Compare the use of different materials* • *Compare movement on different surfaces*
• Classify things by living, dead or never lived • Know how a specific habitat provides for the basic needs of things living there (plants and animals) • Match living things to their habitat • Name some different sources of food for animals • Know about and explain a simple food chain	• Know the basic stages in a life cycle for animals, (including humans) • Know why exercise, a balanced diet and good hygiene are important for humans	• Know and explain how seeds and bulbs grow into plants • Know what plants need in order to grow and stay healthy (water, light & suitable temperature)	• Know how materials can be changed by squashing, bending, twisting and stretching	• Know why a material might or might not be used for a specific job

Substantive Knowledge: Year 3

Biology			Chemistry	Physics	
Animals, including humans	**Plants**	**Plants**	**Rocks**	**Forces**	**Light**
• *Skeleton and muscles* • *Nutrition* • *Exercise and health*	• *Plant life* • *Basic structure and functions*	• *Life cycle* • *Water transportation*	• *Fossil formation* • *Compare and group rocks* • *Soil*	• *Different Forces* • *Magnets*	• *Reflections* • *Shadows*
• Know about the importance of a nutritious, balanced diet • Know how nutrients, water and oxygen are transported within animals and humans • Know about the skeletal and muscular system of a human	• Know the function of different parts of flowing plants and trees	• Know how water is transported within plants • Know the plant life cycle, especially the importance of flowers	• Compare and group rocks based on their appearance and physical properties, giving reasons • Know how soil is made and how fossils are formed • Know about and explain the difference between sedimentary, metamorphic and igneous rock	• Know about and describe how objects move on different surfaces • Know how a simple pulley works and use to on to lift an object • Know how some forces require contact and some do not, giving examples • Know about and explain how magnets attract and repel Predict whether magnets will attract or repel and give a reason	• Know that dark is the absence of light • Know that light is needed in order to see and is reflected from a surface • Know and demonstrate how a shadow is formed and explain how a shadow changes shape • Know about the danger of direct sunlight and describe how to keep protected

Substantive Knowledge: Year 4

Biology		Chemistry	Physics	
Animals, including humans	**All living things and their habitats**	**States of Matter**	**Electricity**	**Sound**
• *Digestive system* • *Teeth* • *Food chains*	• *Grouping living things* • *Classification keys* • *Adaptation of living things*	• *Compare and group materials* • *Solids, liquids and gases* • *Changing state* • *Water cycle*	• *Uses of electricity* • *Simple circuits and switches* • *Conductors and insulators*	• *How sounds are made* • *Sound vibrations* • *Pitch and Volume*
• Identify and name the parts of the human digestive system • Know the functions of the organs in the human digestive system • Identify and know the different types of human teeth • Know the functions of different human teeth • Use and construct food chains to identify producers, predators and prey	• Use classification keys to group, identify and name living things • Know how changes to an environment could endanger living things • Group materials based on their state of matter (solid, liquid or gas)	• Know the temperature at which materials change state • Know about and explore how some materials can change state • Know the part played by evaporation and condensation in the water cycle	• Identify and name appliances that require electricity to function • Construct a series circuit • Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers) • Predict and test whether a lamp will light within a circuit • Know the function of a switch • Know the difference between a conductor and an insulator; giving examples of each	• Know how sound is made, associating some of them with vibrating • Know how sound travels from a source to our ears • Know the correlation between pitch and the object producing a sound • Know the correlation between the volume of a sound and the strength of the vibrations that produced it • Know what happens to a sound as it travels away from its source

Substantive Knowledge: Year 5

Biology		Chemistry	Physics	
All living things and their habitats	**Animals, including humans**	**Properties and changes in materials**	**Forces**	**Earth and Space**
• *Life cycles – plants and animals* • *Reproductive processes* • *Famous naturalists*	• *Changes as humans develop from birth to old age*	• *Compare properties of everyday materials* • *Soluble/ dissolving* • *Reversible and irreversible substances*	• *Gravity* • *Friction* • *Forces and motion of mechanical devices*	• *Movement of the Earth and the planets* • *Movement of the Moon* • *Night and day*
• Know the life cycle of different living things e.g. mammal, amphibian, insect and bird • Know the differences between different life cycles • Know the process of reproduction in plants • Know the process of reproduction in animals	• Create a timeline to indicate stages of growth in humans	• Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets • Know and explain how a material dissolves to form a solution • Know and show how to recover a substance from a solution • Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating) • Know and demonstrate that some changes are reversible and some are not • Know how some changes result in the formation of a new material and that this is usually irreversible	• Know what gravity is and its impact on our lives • Identify and know the effect of air and water resistance • Identify and know the effect of friction • Explain how levers, pulleys and gears allow a smaller force to have a greater effect	• Know about and explain the movement of the Earth and other planets relative to the Sun • Know about and explain the movement of the Moon relative to the Earth • Know and demonstrate how night and day are created • Describe the Sun, Earth and Moon (using the term spherical)

Substantive Knowledge: Year 6

Biology			Physics	
Animals, including humans	**All living things and their habitats**	**Evolution and Inheritance**	**Electricity**	**Light**
• *The circulatory system* • *Water transportation* • *Impact of exercise on body*	• *Classification of living things and the reasons for it*	• *Identical and non identical off-spring* • *Fossil evidence and evolution* • *Adaptation and evolution*	• *Electrical components* • *Simple circuits* • *Fuses and voltage*	• *How light travels* • *Reflection* • *Ray models of light*
• Identify and name the main parts of the human circulatory system • Know the function of the heart, blood vessels and blood • Know the impact of diet, exercise, drugs and lifestyle on health • Know the ways in which nutrients and water are transported in animals, including humans	• Classify living things into broad groups according to observable characteristics and based on similarities and differences • Know how living things have been classified • Give reasons for classifying plants and animals in a specific way	• Know how the Earth and living things have changed over time • Know how fossils can be used to find out about the past • Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents) • Know how animals and plants are adapted to suit their environment • Link adaptation over time to evolution • Know about evolution and can explain what it is	• Compare and give reasons for why components work and do not work in a circuit • Draw circuit diagrams using correct symbols • Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer	• Know how light travels • Know and demonstrate how we see objects • Know why shadows have the same shape as the object that casts them • Know how simple optical instruments work e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

Disciplinary Knowledge

Key Concepts		Enquiry Types
Variables	Something in an enquiry that can be changed or controlled.	Comparative and Fair Testing
Validity	How accurate or correct the results of an enquiry are.	Pattern Seeking
Design	How a scientific question was investigated	Grouping and Classifying
Reporting	How the findings of an enquiry are communicated to others	Observations Over Time
		Research using Secondary Sources

Disciplinary Knowledge

Years 1 & 2

Know that we can ask questions about the world and that when we observe the world to answer these questions, this is science.

Variables	Validity	Design	Reporting
		Appreciate that objects can be identified or sorted into groups based on their observable properties. Understand that we can use magnifying glasses to observe objects closely. Appreciate that we can test our questions to see if they are true.	Appreciate that we can write down numbers and words or draw pictures to record what we find.

Disciplinary Knowledge

Years 3 & 4

Know that we can ask questions and answer them by setting up scientific enquiries
Know how to make relevant predictions that will be tested in a scientific enquiry

Variables	Validity	Design	Reporting
Appreciate that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same.	Appreciate that scientific enquiries can suggest relationships, but that they do not prove whether a prediction is true. Appreciate that scientific enquiries are limited by the accuracy of the measurements (and measuring equipment) and by the extent to which conditions can vary even. Appreciate that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry.	Understand how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches. Appreciate that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts. Appreciate that a theory is an explanation of observations that has been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry.	Understand when to draw bar charts, a neat table or a classification key. Label a diagram using lines to connect information to the diagram and how to use a coloured key. Show the relationship between an independent variable in a two-way table; and how to label specific results in a two-way table. With structured guidance – know how to write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion. Draw conclusions from the findings of other scientists. Shorten a scientific enquiry write-up into a brief oral discussion of what was found in a scientific enquiry.

Disciplinary Knowledge

Years 5 & 6

- **Know that we can ask questions and answer them by setting up scientific enquiries**
- **Know how to make relevant predictions that will be tested in a scientific enquiry**

Variables	Validity	Design	Reporting
Choose appropriate variables to test a hypothesis (e.g., plant height as a dependent variable when measuring effect of light on plant growth).	Identify conditions that were imperfectly controlled and can explain how these might affect results. Accurately use further measuring devices, including digital and analogue scales, measuring cylinders and beakers, recognizing the relative accuracy of each device. Evaluate the validity of the data collected and suggest improvements for future enquiries.	Appreciate how and when to repeat measurements, how to find an average of a set of measurements and how to recognize and remove outliers from a set of data, justifying the removal as a potential mis-measurement.	Independently write up a simple scientific enquiry, including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion. Present brief oral findings from an enquiry, speaking clearly and with confidence and using notes where necessary. Appreciate instances where scientific evidence has been used to support or refute ideas or arguments (e.g., fossil records as evidence of natural selection).

Opportunities for using Disciplinary Knowledge

Year 1

	Comparative and Fair Testing	Observations over time	Research using Secondary Sources	Grouping and Classifying	Pattern Seeking
Seasonal Changes		Observe changes in temperature throughout the year			Identify length of daylight throughout the year
Animals, including humans			Research animals that live in a particular habitat	Group or classify animals according to what they eat	
Body parts and senses	Set up a test to notice the difference in our ability to hear the further away we are from the source				Note height changes as we get older
Plants		Observe changes to plants or trees as they grow or in different seasons		Identify local trees and plants	
Everyday Materials	Compare the suitability of everyday materials for a specific job, e.g., building a bridge			Identify different materials based on their properties	

Opportunities for using Disciplinary Knowledge					
Year 2					
	Comparative and Fair Testing	**Observations over time**	**Research using Secondary Sources**	**Grouping and Classifying**	**Pattern Seeking**
Uses of everyday materials	Compare materials to see which is the most waterproof			Group different materials based on their properties	
Animals, including humans			Research different food groups and design a balanced menu	Identify the off-spring of different animals	
Living things and their habitats			Research animals and how they adapt to their environment	Group animals based on their natural habitats	
Plants	Investigate which conditions plants need to grow	Change in plant growth over time		Identify parts of a plant	
Forces (Introduction)	Investigate the effect of force on the speed an object moves			Group materials based on how they react to a force (e.g., stretchy)	

Opportunities for using Disciplinary Knowledge

Year 3

	Comparative and Fair Testing	Observations over time	Research using Secondary Sources	Grouping and Classifying	Pattern Seeking
Rocks and soil			Research how fossils and different types of rocks are formed	Identify different rocks and the group they belong to	
Animals, including humans		Observe the effect of excess sugar over time (based on egg shells)	Research animals to identify their animal group and habitat	Group/ classify and animal based on its group and species	
Plants		Observe how water travels up the stem	Research different types of seed dispersal		
Light	Compare materials based on reflectiveness	Shadow length throughout the day		Group materials based on their opacity and transparency	Object size compared to shadow
Forces and magnets	Compare materials based on the amount of friction they generate			Group magnetic and non-magnetic materials	

Opportunities for using Disciplinary Knowledge

Year 4

	Comparative and Fair Testing	Observations over time	Research using Secondary Sources	Grouping and Classifying	Pattern Seeking
Electricity	Determine which materials are electrical conductors or insulators			Classify/ group materials into electrical conductors or insulators	
Animals, including humans			Research the different body parts involved in digestion	Classify plants/ animals into either producer, consumer or predator	
Living things and their habitats			Research the effect of climate change on animals around the world	Classify animals based on their observable characteristics	
States of Matter		Measure temperature changes in water over time	Research the water cycle and how it works	Identify solids, liquids or gases	
Sound	The affect of distance from the source on volume				Compare how length and width of tubes affect pitch

Opportunities for using Disciplinary Knowledge

Year 5

	Comparative and Fair Testing	Observations over time	Research using Secondary Sources	Grouping and Classifying	Pattern Seeking
Earth and Space			Research the plants in our solar system, including length of orbit		Compare the distance a planet is from the Sun and its temperature
Animals, including humans			Research changes in humans at different stages in our lives		Compare height with physical task e.g., distance a ball is thrown
Forces	Shape of an object and the time it takes to travel through water				Surface material on a ramp and the distance/ speed it travels
Properties and changes of materials	Factors that affect the speed a solute dissolves in water, e.g., temperature	Observe over time the separation of a solute and solvent via evaporation		Classify/ group materials as either soluble or insoluble	
Living things and their habitats			Research the life cycle of different animal groups	Classify/ group and animal based on its group and species	

Opportunities for using Disciplinary Knowledge

Year 6

	Comparative and Fair Testing	Observations over time	Research using Secondary Sources	Grouping and Classifying	Pattern Seeking
Electricity	Effect of increasing voltage on the brightness of a bulb				Compare brightness of bulb in series and parallel circuits
Animals, including humans	Impact of exercise on the heart rate		Research how drugs affect the body		Compare resting heart rate of different people
Living things and their habitats		Conditions needed for bread to go mouldy	Research the different types of micro-organisms	Classify different types of arthropod	
Evolution and Inheritance			Research Charles Darwin and his work		Compare sculls/ body parts of animals as they have evolved
Light				Group materials based on transparency	Compare distance from light source and shadow

Science Overview

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Autumn	Getting to know you Harvest Bears Celebrations and festivals	Plants Seasonal Changes	Plants Animals including humans	Light Rocks	Sound Animals including humans	Animals including humans Earth and Space	Light Electricity
Spring	Birds and Winter Feelings and Fantasy	Materials Animals including humans	Living things and their habitats	Forces and Magnets Plants	States of Matter Living things	Properties and changes of materials	Living things
Summer	Living things Under the sea Summer	Animals including humans	Use of Everyday Materials	Animals including humans	Electricity	Forces	Evolution and inheritance

Long-term overview for Science

YEAR 1

Biology

- The first unit related to plants, picked up again in Years 2 and 3.
- Children will have grown plants and talked about them in EYFS.

What are the names of the different parts of plants?

What are the names of the main parts of plants, including root, stem, leaf and petal?

What part does each part of a plant play in keeping it healthy?

How many wild and garden flowers do you recognise?

What are the main parts of a tree called?

How many birds can you recognise?

Science Knowledge

- Know and name a variety of common wild and garden plants
- Know and name the petals, stem, leaves and root of a plant
- Know and name the roots, trunk, branches and leaves of a tree

Working Scientifically

Observations over time

- Changes to plants/ trees as they grow or in different seasons

Grouping and Classifying

- Identify local trees and plants

Long-term overview for Science

YEAR 1

Physics

- The only physics unit in Key Stage 1
- Children will have done quite a lot about seasons in EYFS (Understanding the World)

How do seasons change?

Why do we have seasons and what are the months associated with each?

Why do so many people love the spring?

What do we know about the summer?

Why are there so many leaves on the floor in autumn?

Science Knowledge

- Know the names of the seasons
- Know about the weather associated with each season
- Know the months within each season

Working Scientifically

Observation over time

- Changes in temperature throughout the year
- Changes in rainfall throughout the year

Pattern seeking

- Length of daylight throughout the year
- Leaf colour and fall and different stages

Long-term overview for Science

YEAR 1

Chemistry

- The first unit related to materials which is built upon in Year 2.
- In EYFS children will have become familiar with many different materials including naming them.

What are the materials that are around us called?

What are the names of the materials that we see around the school?

Why do we use different materials to build a house?

Which materials keep us dry?

Which materials keep us warm?

Working Scientifically

Comparative and Fair tests

- Compare the suitability of everyday materials for a specific job, e.g., keeping us warm

Grouping and Classifying

- Identify different materials based on their properties

Long-term overview for Science

YEAR 1

Biology

- The first in a range of learning about classifying animals which is picked up again in Year 2

How are animals classified?

What are the main differences between carnivore, omnivore and herbivore?

How can we identify reptiles, mammals and amphibians?

What are the birds in our locality called?

How do we sort according to living and not living?

Science Knowledge

- Know how to classify a range of animals by amphibian, reptile, mammal, fish and birds
- Know and classify animals by what they eat (carnivore, herbivore and omnivore)
- Know how to sort by living and non-living things

Working Scientifically

Research using secondary sources

- Research animals that live in a particular habitat

Grouping and Classifying

- Group/ classify animals according to what they eat

Long-term overview for Science

YEAR 1

Biology

- The first unit related to the human body. There is a unit related to the human body in each year from Y1 to Y6.
- Children will have used rhymes and songs in EYFS which relate to body parts, etc.

What are our seen body parts called and what do we mean by the five senses?

What are the names of the seen parts of the human body?

What are the five senses?

Science Knowledge

- Know the name of parts of the human body that can be seen
- Know about the five senses.

Working Scientifically

Pattern seeking

- Height and weight changes as we get older

Long-term overview for Science

YEAR 2

Biology

- Although the unit deals with animals it does not carry on directly from the Y1 classification unit.
- It is the first unit related to where animals live, etc.

Why do animals choose the habitats they have?

Which animals live underground, on the ground or in trees?

Which animals live in woodlands and forests in the UK and abroad?

Which animals do we normally find in our seas, rivers, lakes and ponds and why are they there?

Which animals start their life as an egg?

Which food sources are linked to which animals?

Science Knowledge

- Classify things by living, dead or never lived
- Know how a specific habitat provides for the basic needs of things living there (plants and animals)
- Match living things to their habitat
- Name some different sources of food for animals
- Know about and explain a simple food chain

Working Scientifically

Researching

- Research animals and how they adapt to their environment

Grouping and Classifying

- Group animals based on their natural habitats

Long-term overview for Science

YEAR 2

Chemistry

- This unit follows on well from the Y1 unit, but focuses on using different materials.
  - Is picked up to a certain extent again in Y4 with the state of matter unit.

What are the properties of different materials?

Why are some materials more suitable than others for making our toys?

Why would glass, wood, plastic, brick or metal be used for particular jobs?

Why can some materials be squashed, twisted or bent according to need?

Why certain materials are suitable for many different uses?

Who are the people that have developed useful new materials?

Science Knowledge

- Know how materials can be changed by squashing, bending, twisting and stretching
- Know why a material might or might not be used for a specific job

Working Scientifically

Fair testing

- Compare materials to see which is the most waterproof

Grouping and Classifying

- Group different materials based on their properties

Long-term overview for Science

YEAR 2

Biology: Human Body

- This unit follows on well from the Y1 naming parts of the human body.
- Links to DT and PE are clear.
- Moves on to Y3 skeleton and muscles unit.

Why is it important to keep our bodies healthy?

What do we mean by a balanced diet and why is it important for humans?

Who is the fittest in our class?

Why is exercise and good hygiene important for humans?

What are the main stages of growth from babies to adulthood, in humans and in animals?

Science Knowledge

- Know that animals, including humans, have offspring, which grow into adults
- Find out about, and describe, the basic needs of animals, including humans, for survival (water, food and air)
- Describe the importance for humans of exercise, eating the right amount of different types of food, and hygiene

Working Scientifically

Investigation

- Set up an investigation to find out who is the fittest in the class

Grouping and Classifying

- Identify the off-spring of different animals

Long-term overview for Science

YEAR 2

Biology

- This unit picks up on the Year 1 plants unit and focuses on the growth of plants.
- However, in Y3 there is a big jump up to deal with issues of germination, pollination, etc.

What do plants and trees need to grow healthily?

What are the main parts of plants or trees, including roots, stem, leaf and petal, called?

How do we know that plants and trees need light, water and soil?

What are the names of some trees in our locality?

How can we find out how old a tree is?

Science Knowledge

- Know and explain how seeds and bulbs grow into plants
- Know what plants need in order to grow and stay healthy (water, light & suitable temperature)

Working Scientifically

Fair testing

- Investigate which conditions plants need to grow

Observation over time

- Change in plant growth over time

Grouping and Classifying

- Identify parts of a plant

Long-term overview for Science

YEAR 3

Physics

- This the first full unit on light and dark although pupils will have met elements of it in Y1.
- It is picked up again in the unit in Y6.

Why do we have light and dark and what is its impact on our everyday life?

What is dark (in relation to the absence of light)?

Why do we need light?

What happens to light when it hits a shiny object?

How is a shadow formed and why does it change shape?

Why is it dangerous to look directly into the sun?

Substantive Knowledge

- Know that dark is the absence of light
- Know that light is needed to see and is reflected from a surface
- Know and demonstrate how a shadow is formed and explain how a shadow changes shape
- Know about the danger of direct sunlight and describe how to stay protected

Disciplinary Knowledge

Fair testing

- Compare materials based on reflectiveness

Observation over time

- Shadow length throughout the day

Grouping and Classifying

- Group materials based on their opacity and transparency

Pattern Seeking

- Object size compared to the shadow

Long-term overview for Science

YEAR 3

Chemistry

- This the first and only full unit on rocks and soil. However, pupils will have focused on dinosaurs and fossils at some stage, even if it was in EYFS.

What are the main types of rocks on our Earth?

How are fossils are formed?

What is soil?

What is the difference between igneous, sedimentary and metamorphic rocks?

Why are some crystals extremely rare and valuable?

Science Knowledge

- Compare and group rocks based on their appearance and physical properties, giving reasons
- Know how soil is made and how fossils are formed
- Know about and explain the difference between sedimentary, metamorphic and igneous rock

Working Scientifically

Research

- Research how fossils and different types of rocks are formed

Grouping and Classifying

- Identify different rocks and the group they belong to

Long-term overview for Science

YEAR 3

Physics

- This the first full unit on forces. However, pupils will have met some forces work in KS1 and EYFS. Focus here on friction, air and water resistance

What do we mean by a 'force'?

What is friction?

What is a magnet?

How do pulleys work?

Science Knowledge

- Know about and describe how objects move on different surfaces
- Know how a simple pulley works and can be used to lift an object
- Know how some forces require contact and some do not, giving examples
- Know about and explain how magnets attract and repel. Predict whether magnets will attract or repel and give a reason

Working Scientifically

Fair testing

- Compare materials based on the amount of friction they generate

Grouping and Classifying

- Group magnetic and non-magnetic materials

Long-term overview for Science

YEAR 3

Biology: Plants

- This follows on from the two previous plants units in Y1 and Y2. This one is much more demanding and requires considerable igniting prior learning.

What roles do different parts of plants play in helping them grow healthily?

What are the functions of different parts of the flowering plant?

What key factors are important for a plant's growth?

How is water transported within a plant?

What do we mean by pollination?

What types of pollination are there?

Science Knowledge

- Know the function of different parts of flowing plants and trees
- Know what pollination is
- Know about seed dispersal

Working Scientifically

Observation over time

- Observe how water travels up the stem

Research

- Research different types of seed dispersal

Long-term overview for Science

YEAR 3

Biology: Human Body

- This follows on from the two previous human body units in Y1 and Y2. It also prepares pupils for the Y4 unit on the digestive system.

Why do humans have skeletons and muscles?

What are the names of the body parts associated with the skeleton?

What are the muscles and how do they work?

What are joints and how do they work?

Why is it important to have a balanced diet and why exercise is important?

Science Knowledge

- Know about the importance of a nutritious, balanced diet
- Know how nutrients, water and oxygen are transported within animals and humans
- Know about the skeletal and muscular system of a human

Working Scientifically

Experimenting and Investigating

- Find out how muscles work using balloons
- Carry out an investigation into exercise

Research

- Find out about the names of joints
- Find the names of parts of the skeleton

Long-term overview for Science

YEAR 4

Physics

- This is the only full unit on sound in the primary science curriculum. However, there are links to music at different levels.

How is sound created and how does it travel?

How do our ears work?	What do we mean by 'pitch' and 'vibration' in relation to sound?
How do telephones work?	What happens to sound as it travels away from its source?

Science Knowledge

- Know how sound is made, associating some of them with vibrating
- Know how sound travels from a source to our ears
- Know the correlation between pitch and the object producing a sound
- Know the correlation between the volume of a sound and the strength of the vibrations that produced it
- Know what happens to a sound as it travels away from its source

Working Scientifically

Fair testing

- The effect of distance from the source on volume

Pattern seeking

- Compare how the length and width of tubes affect the pitch

Long-term overview for Science

YEAR 4

Biology: Human Body

- This continues the human body theme and focuses on the food we eat before moving on in Y5 to changes as we grow and then to the circulatory system in Y6.

What happens to the food we eat?

What are the parts of the digestive system called?

What is the function of each organ within the digestive system?

What are the names and functions of the different types of teeth in humans?

How can the digestive system be recreated in a classroom?

What are food chains and how can we use them to identify producers, predators and prey

Science Knowledge

- Identify and name the parts of the human digestive system
- Know the functions of the organs in the human digestive system
- Identify and know the different types of human teeth
- Know the functions of different human teeth
- Use and construct food chains to identify producers, predators and prey

Working Scientifically

Research

- Research the different body parts involved in digestion

Grouping and classifying

- Classify plants/animals into either producer, consumer or predator

Investigation

- Recreating a digestive system in class

Long-term overview for Science

YEAR 4

Chemistry

- To a certain extent this unit links to the materials learning in Y1 and Y2.
- However, it is an important link to the Y5 unit on reversible and irreversible changes

How do some solids, liquids and gases change state?

How can we classify solids, liquids and gases?

What do we mean by freezing and melting?

How can you separate sand, salt and water?

What is a water cycle?

What is meant by the terms: condensation, and evaporation?

Science Knowledge

- Know the temperature at which materials change state
- Know about and explore how some materials can change state
- Know the part played by evaporation and condensation in the water cycle

Working Scientifically

Observation over time

- Measure temperature changes in water over time

Research

- Research the water cycle and how it works

Grouping

- Identify solids, liquids and gases

Long-term overview for Science

YEAR 4

Biology: Living things

- This follows on from the classifying that happened in Y1 and to a certain extent the habitats learning in Y2

How are living things grouped?

How do we use classification keys to group living things?

How can we identify and group trees?

How can we group plants and animals?

How can environments change for good?

Science Knowledge

- Use classification keys to group, identify and name living things
- Know how changes to an environment could endanger living things
- Group materials based on their state of matter (solid, liquid or gas)

Working Scientifically

Research

- Research the effect of climate change on animals around the world

Grouping

- Classify plants/ animals into either producer, consumer or predator

Long-term overview for Science

YEAR 4

What is electricity and why it so important in our lives?

- How does electricity work?
- How can we construct a simple series electrical circuit?
- What is renewable energy and is it better than fossil fuels?
- How important is electricity at home?
- What are conductors and what are insulators?

Working Scientifically (Disciplinary)

Fair testing

- Determine which materials are electrical conductors or insulators
- Predict and test whether a lamp will light within a circuit

Grouping and classifying

- Classify/ group materials into electrical conductors or insulators

Long-term overview for Science

YEAR 5

Biology: Animals, including Humans

- This links to the life cycles of animals in previous units.
- However, it is also links to the human body strand in Year 1.

What do we know about the life cycles of humans and various animals?

What happens to us as we get older?

What do the terms puberty, gestation and reproduction mean?

What is the early life cycle of a human being?

What is the process of reproduction in plants?

What is the process of reproduction in animals?

Science Knowledge

- Know the life cycle of different living things, e.g. mammal, amphibian, insect and bird
- Know the differences between different life cycles
- Know the process of reproduction in plants
- Know the process of reproduction in animals
- Create a timeline to indicate stages of growth in humans

Working Scientifically

Research

- Research changes in humans at different stages in our lives
- Research the life cycle of different animal groups

Grouping

- Classify/group an animal based on its group and species

Pattern seeking

- Compare height with physical task, e.g., distance a ball is thrown

Long-term overview for Science

YEAR 5

Physics

- This is a standalone unit although there are some links to the Y3 unit on light and dark.

What do we know about the Sun, Earth, Moon and the Planets?

Can you explain the movement of the Earth and other planets relative to the Sun?

Can you explain the movement of the Moon relative to the Earth?

Can you demonstrate how night and day are created?

What do we know about the dimensions associated with the Sun, Earth and Moon?

What information do you know about the planets?

Science Knowledge

- Know about and explain the movement of the Earth and other planets relative to the Sun
- Know about and explain the movement of the Moon relative to the Earth
- Know and demonstrate how night and day are created
- Describe the Sun, Earth and Moon (using the term spherical)

Working Scientifically

Research

- Research the planets in our solar system, including the length of orbit

Pattern seeking

- Dimensions associated with the Sun, Earth and Moon

Long-term overview for Science

YEAR 5

Chemistry

- This links to the Y4 unit of learning on states of matter.

Which materials can or cannot be changed back to their original form?

What does reversible and irreversible changes mean?

How can you set up an investigation to find which materials can and cannot be changed back to their original state?

How can mixtures be separated, including through filtering, sieving and evaporating?

How has the science related to reversible and irreversible changes helped with crime work?

Science Knowledge

- Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets
- Know and explain how a material dissolves to form a solution
- Know and show how to recover a substance from a solution
- Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating)
- Know and demonstrate that some changes are reversible and some are not
- Know how some changes result in the formation of new material and that this is usually irreversible

Working Scientifically

Fair testing

- Factors that affect the speed a solute dissolves in water, e.g., temperature

Observation over time

- Observe over time the separation of a solute and solvent via evaporation

Grouping

- Classify/ group materials as either soluble or insoluble

Long-term overview for Science

YEAR 5

Physics

- This is a unit that has some links to the Y3 unit on forces.
- It also has links to DT mechanisms aspect.

What is a force and how does it impact on the way things move?

What is gravity and what is its impact on our lives?

What are pulleys and why are they important in our everyday life?

What is air resistance and what effect does it have?

What is friction and what effect does it have?

How do gears allow a smaller force to have a greater effect?

Science Knowledge

- Know what gravity is and its impact on our lives
- Identify and know the effect of air and water resistance
- Identify and know the effect of friction
- Explain how levers, pulleys and gears allow a smaller force to have a greater effect

Working Scientifically

Fair testing

- Shape of an object and the time it takes to travel through water

Pattern seeking

- Surface material on a ramp and note the distance/speed it travels

Long-term overview for Science

YEAR 6

Biology: Light

- There are links to the Y3 unit on light and dark. There are also links with the human body strand when it comes to look at the working of the eye.

How do our eyes help us see?

How does light travel?

How do we know that light travels in straight lines?

How do our eyes work?

What do we mean by concave and convex mirrors?

Why do shadows have the same shape as the objects that cast them?

Science Knowledge

- Know how light travels
- Know and demonstrate how we see objects
- Know why shadows have the same shape as the object that casts them
- Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

Working Scientifically

Grouping and Classifying

- Group materials based on transparency

Pattern seeking

- Compare distance from light source and shadow

Experimenting and investigating

- Experiment to find out that light travels in straight lines

Long-term overview for Science

YEAR 6

Physics

- This is a unit that has direct links to the Y4 unit on electricity. This one is more focused on its power.

How does electricity work and how does its power vary?

How does electrical energy vary?

What do we mean by electrical particles?

Which symbols are used to represent different parts of a simple circuit?

How can we construct simple series circuits?

How can we make use of our knowledge of circuits to create a simple game?

Science Knowledge

- Compare and give reasons why components work and do not work in a circuit
- Draw circuit diagrams using the correct symbols
- Know how the number and voltage of cells in a circuit link to the brightness of a lamp or the volume of a buzzer

Working Scientifically

Fair testing

- Effect of increasing voltage on the brightness of a bulb

Pattern seeking

- Compare brightness of bulb in series and parallel circuits

Long-term overview for Science

YEAR 6

Biology: Human Body

- There are links to the Y1 to Y5 human body strands.
- Many pupils will find it useful to consider the link to Y4 digestive system.

How does the heart work and why is it so important?

What part does the heart play in the human circulatory system?

What is the circulatory system and how does it work?

What is the impact of diet, exercise, drugs and lifestyle on health?

What is the relationship between your heartbeat and exercise?

Who was William Harvey and what was his contribution to science?

Science Knowledge

- Identify and name the main parts of the human circulatory system
- Know the function of the heart, blood vessels and blood
- Know the impact of diet, exercise, drugs and lifestyle on health
- Know how nutrients and water are transported in animals, including humans

Working Scientifically

Fair testing

- Impact of exercise on the heart rate

Research

- Research how drugs affect the body

Pattern seeking

- Compare the resting heart rates of different people

Long-term overview for Science

YEAR 6

Biology: Classifying

- There are links to the Y1 and Y4 units on animals including humans.
  - In Y1 the classification of animals and in Y4 grouping animals.

How are living things grouped and classified?

What do we know about the five kingdoms: animals, plants, monera, protista and fungi?

What can you find out about the special attributes that some animals and plants have to help them survive?

What do we know about vertebrate and invertebrate animals?

Who was Carl Linnaeus?

Science Knowledge

- Classify living things into broad groups according to observable characteristics and based on similarities and differences
- Know how living things have been classified
- Give reasons for classifying plants and animals in a specific way

Working Scientifically

Observation over time

- Conditions needed for bread to go mouldy

Research

- Research the different types of micro-organisms

Pattern seeking

- Compare resting heart rate of different people

Long-term overview for Science

YEAR 6

Biology:
This is a stand-alone unit. However, there are links to some areas such as Y3 fossils and to a certain extent the Y5 changes as we grow.

How have living things on Earth changed over time?

What do we mean by evolution and inheritance?

What part do fossils play in helping us understand more about living things that inhabited our Earth millions of years ago?

How do off-spring vary so that they are not normally identical to their parents?

Who was Charles Darwin and why does he remain a controversial figure?

How have animals and plants adapted to suit their environment in different ways and how may that adaptation lead to evolution?

Science Knowledge

- Know how the Earth and living things have changed over time
- Know how fossils can be used to find out about the past
- Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents)
- Know how animals and plants are adapted to suit their environment
- Link adaptation over time to evolution
- Know about evolution and can explain what it is

Working Scientifically

Research

- Research Charles Darwin and his work

Pattern seeking

- Compare skulls/body parts of animals as they have evolved