Science – Year A

Topic	Pre-School	Reception and Year 1	Lower Key Stage 2	Upper Key Stage 2
Scientists and Working Scientifically	Experimenting - Forces and Changes of State	Working Scientifically	Working Scientifically	Working Scientifically Electricity
Animals Including Humans	Senses	Our Human Body	Young and Adult - Year 2 Unit	Puberty and Old Age
Properties of Materials	Natural Materials	Everyday Materials - Year 1 Unit	How do we use materials differently? Year 2 Unit	States of Matter - Year 4 Unit
Plants and Living Things	Growing (Plants and Us)	Perfect Plants - Year 1 unit	Growing and Growing - Year 2 Unit	Vertarbrates and Invertebrates - Year 4 Unit
Understanding the World and Beyond	Animals	The Five Types of Animals	Understadning Electricity - Year 4 Unit	Earth and Space - Year 5 Unit
Mini Beasts	MiniBeasts and life cycles	Animals in our Habitat - Mini Beasts and other creatures	Biodiversity and Mini Beasts - Year 2 Unit	Evolutaion and Inheritance

Science – Year B

Topic	Pre-School	Reception and Year 1	Lower Key Stage 2	Upper Key Stage 2
Scientists and Working Scientifically	Experimenting	Working Scientifically	Working Scientifically	Working Scientifically Light
Animals including humans	Senses	Our Human Body	How do animals stay healthy? - Year 3 Unit	Puberty and Diet, Exercise and Lifestyle
Understadning Our World and Beyond	Natural Materials	The Five Types of Animals	forces, friction and magnetic attraction - Year 3 Unit	Leavers, gears and Pullys - Year 5 Unit
Properties of Materials	Growing (Plants and Us)	Everyday Materials	Rocks! - Year 3 unit	Mixtures and irreversible changes - Year 5 Unit
Plants and Living Things	Animals	Perfect Plants	Investigating Plants - Year 3 Unit	Life Cycles of Plants, animals & insects Year 5 Unit
Mini Beasts/light and Sound	MiniBeasts and life cycles	Animals in our habitat - Mini Beasts and other creatures	Light, reflection and Shadows - Year 3 UNit	Sound, pitch and volume - Year 4 Unit

Intent

At The Darley and Summerbridge Federation we aim for a high quality science curriculum. A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

It is our intention that our pupils will:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

Pupils with SEND

To support pupils with SEND to access a full science curriculum, we use a range of approaches which include, but are not limited to: pre-teaching scientific vocabulary; use of visual aids; scaffolding resources, such as experiment templates and writing frames; additional thinking time; additional adult support; use of technology; multi-sensory activities; alternative means to record responses; science concept cartoons; task breakdown plans; use of vocabulary mats, and; targeted questioning.

Science – How do we investigate?

In Class 1 we...

National Curriculum Expectation

Working scientifically

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- **asking simple questions and recognising that they can be answered in different ways**
- **observing closely, using simple equipment**
- **performing simple tests**
- **identifying and classifying**
- **using their observations and ideas to suggest answers to questions**
- **gathering and recording data to help in answering questions**

This unit is all about beginning to embed the working scientifically process: giving the children the skill that they will need across the year to help with their scientific questioning and investigation.

What is science?

What is a test?

What does it mean to observe?

How can I identify and classify?

How can I gather and record data?

Science – Our Human Body

In Class 1 we...	
National Curriculum Expectation **During years 1 and 2 children should be taught to:** **name, locate and label parts of the human body. Children can make suggestions about what the main parts of the body do.** Sugested Teaching Material	*Children will learn about the parts of the human body and have the opportunity to explore the five senses through a simple investigation.* **Can you find and locate parts of the body?** **What do the different parts of the body do?** **How can we look after our body parts?**

Science – Everyday Materials - Year 1 Unit

In Class 1 we...	
National Curriculum Expectation **Everyday materials** **Pupils should be taught to:** **distinguish between an object and the material from which it is made** **identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock** **describe the simple physical properties of a variety of everyday materials** **compare and group together a variety of everyday materials on the basis of their simple physical properties** Sugested Teaching Material	*This 'Everyday Materials' unit will teach your class about everyday materials including wood, plastic, metal, water and rock. Children will learn to identify and name everyday materials and will have the opportunity to explore the properties of these materials.* **What different materials do we use?** - wood, plastic, glass, metal, water, and rock **How can we sort materials into different groups?** **What are the properties of different materials?**

Science – Perfect Plants - Year 1 unit

In Class 1 we...	
National Curriculum Expectation **Plants** **Pupils should be taught to:** **identify and name a variety of common wild and garden plants, including deciduous and evergreen trees** **identify and describe the basic structure of a variety of common flowering plants, including trees** Sugested Teaching Material	In this unit about plants, children will learn to name the basic parts of a plant, including seeds. They will have the opportunity to plant their own seeds and to make observations of how they grow over time. Children will also learn to identify, name and describe a variety of garden and wild plants as well as evergreen and deciduous trees. **What is basic structure of a variety of common flowering plants, including trees?** **Can you name a variety of common wild and garden plants, including deciduous and evergreen trees?** **How can we observe and classify different types of plants, leaves and trees?**

Science – The Five Types of Animals - Year 1 Unit

In Class 1 we...	
National Curriculum Expectation **Animals Including Humans** **Pupils should be taught to:** **identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals** **identify and name a variety of common animals that are carnivores, herbivores and omnivores** **describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)** **identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense** Sugested Teaching Material	*In this unit about Animals Including Humans, children will learn about five of the groups that scientists use to classify animals: mammals, fish, birds, reptiles and amphibians. They will learn to identify the group an animal belongs to by its features and will classify animals according to their group. They will also learn about the different diets animals eat. Children will learn about the parts of the human body and have the opportunity to explore the five senses through a simple investigation.* **How can we identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals?** **How do we describe and compare the structure of a variety of common animals?** **Is it a carnivore, herbivore or an omnivore?** **Are Humans animals? Can we label parts of the human body?**

Science – Biodiversity and Mini- Beasts

In Class 1 we...

National Curriculum Expectation

Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat. They should understand how to take care of animals taken from their local environment and the need to return them safely after study.

Sugested Teaching Material

In this unit about Biodiversity and Minibeasts, children will learn about the importance of biodiversity and what an ecosystem is. The unit focuses on minibeasts and habitats found in the UK. Children will learn about different types of minibeasts, their microhabitats, what they need from their habitat and how living things depend on each other in order to survive. They will also learn about the benefits of minibeasts for the planet and the important roles they play, including pollination. Part of the aim of this unit is to eliminate fear and misconceptions surrounding minibeasts in order to build a better understanding and appreciation of their importance for the planet and how they impact daily life.

Where do mini-beasts like to live?

What is a minibeast?

What do mini-beasts need to survive?

Can you group minibeasts?

Science Seasons

In Class 1 we...

National Curriculum Expectation

Seasonal changes
Pupils should be taught to:

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

Sugested Teaching Material

Sugested Teaching Material

This Seasonal Changes unit will be delivered over the year in four short sessions to match the seasons. These science sessions will be woven into the science and topic curriculums.

What changes can we see over the four seasons?

What types of weather might we have in Spring and Summer?

How can we observe and describe weather?

Why does the day length vary in different seasons?

Science – Working Scientifically Year A

In Class 2 we...	
National Curriculum Expectation **Working scientifically** **During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:** • **asking simple questions and recognising that they can be answered in different ways** • **observing closely, using simple equipment** • **performing simple tests** • **identifying and classifying** • **using their observations and ideas to suggest answers to questions** • **gathering and recording data to help in answering questions** Sugested Teaching Material	**What is science?** (Asking scientific questions) **What is a fair test?** **What does it mean to observe and measure using standard units?** **How can I identify differences, similarities or changes?** **How can I gather and record data in a variety of ways?** (Bar charts and tables)

Science – Young and Adult - Year 2 Unit

In Lower KS2 we learn about…

National Curriculum Expectation

Living things and their habitats
Pupils should be taught to:

explore and compare the differences between things that are living, dead, and things that have never been alive
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
identify and name a variety of plants and animals in their habitats, including microhabitats
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

Sugested Teaching Material

In this unit, Animals Including Humans, children will begin by looking at animal young and comparing them to their adults. They will look at how animals change as they grow up and be introduced to the life cycles of several varied common animals, including humans. They look in detail at how humans change as they grow older, drawing on their own observations. Children are introduced to the three basic needs of animals for survival (water, food and air).

Why do adults have offspring and how do they grow into adults?

What are the basic needs of animals, including humans, for survival (water, food and air)?

What is the importance of humans exercising, eating the right amounts of different types of food, and staying clean?

Science – How do we use materials differently? Year 2 Unit

In Lower KS2 we learn about…

National Curriculum Expectation

Uses of everyday materials
Pupils should be taught to:

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

Sugested Teaching Material

This 'Uses of Everyday Materials' unit will teach your class about the uses of everyday materials including wood, plastic, metal, glass, brick, paper and cardboard. Children then go on to compare the suitability of different everyday materials for different purposes. They explore how objects made of some everyday materials can change shape and how the recycling process is able to reuse some everyday materials numerous times.

How can we compare the usefulness of a variety of everyday materials?

- wood, metal, plastic, glass, brick, rock, paper and cardboard

How can solid objects be changed by squashing, bending, twisting and stretching?

How do we recycle different materials?

Science – Growing and Growing - Year 2 Unit

In Lower KS2 we learn about…	
National Curriculum Expectation **Plants** **Pupils should be taught to:** **observe and describe how seeds and bulbs grow into mature plants** **find out and describe how plants need water, light and a suitable temperature to grow and stay healthy** Sugested Teaching Material	*In this unit, children will learn what plants need to stay healthy. They will have the opportunity to carry out their own investigations into what plants need to grow well. Children will also closely observe the inside of a seed and learn about the life cycle of a plant. They will also learn how plants look when they don't get the things they need.* **Why do plants need water, light and a suitable temperature to grow and stay healthy?** **How do seeds and bulbs grow into mature plants?**

Science – Understanding Electricity - Year 4 Unit

In Lower KS2 we learn about…

National Curriculum Expectation

Electricity
Pupils should be taught to:

identify common appliances that run on electricity
construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
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
recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
recognise some common conductors and insulators, and associate metals with being good conductors

Sugested Teaching Material

Children will learn about common electrical appliances and how to construct simple series circuits. They will become familiar with the key words linked to the topic and how to apply them appropriately. Children will learn about cells, wires, bulbs and buzzers and about the different types of switches. They will be able to troubleshoot and identify whether or not a bulb will light in a simple series circuit and be able to identify a complete circuit. The children will also learn about conductors and insulators and know that metals are very good electrical conductors.

Which common appliances run on electricity?

How can we construct **a simple series electrical circuit?**

- cells, wires, bulbs, switches and buzzers.

What are some common conductors and insulators?

How do switches work to create an open and closed circuit?

Science – Biodiversity and Mini-Beasts

In Lower KS2 we learn about…

National Curriculum Expectation

Pupils should be taught to:

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

identify and name a variety of plants and animals in their habitats, including microhabitats 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

Sugested Teaching Material

In this unit about Biodiversity and Minibeasts, children will learn about the importance of biodiversity and what an ecosystem is. The unit focuses on minibeasts and habitats found in the UK. Children will learn about different types of minibeasts, their microhabitats, what they need from their habitat and how living things depend on each other in order to survive. They will also learn about the benefits of minibeasts for the planet and the important roles they play, including pollination.

How can we identify plants and animals and their habitats?

How can we create bee and mini-beast friendly environments?

Why do we need worms in our eco-sysytems?

Science – Working Scientifically Year B

In Lower KS2 we learn about…	
National Curriculum Expectation **Working scientifically** **During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:** • **asking relevant questions and using different types of scientific enquiries to answer them** • **setting up simple practical enquiries, comparative and fair tests** • **making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers** • **gathering, recording, classifying and presenting 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** • **reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions** • **using 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** • **using straightforward scientific evidence to answer questions or to support their finding**	**What is science?** (Asking scientific questions) **How can I make predications?** **How can I use evidence to draw simple conclusions?** **How can I use conclusions to raise further questions?**

Science – How do animals stay healthy? - Year 3 Unit

In Lower KS2 we learn about…

National Curriculum Expectation

Animals, including humans
Pupils should be taught to:

notice 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 amounts of different types of food, and hygiene

Sugested Teaching Material

This unit recaps the children's learning from year 2 about how animals survive and stay healthy and helps children to learn more about what makes a healthy, balanced diet. They learn about the nutrients that different foods provide and how these nutrients help our bodies. They also explore how different animals eat different types of foods and need different proportions of nutrients. They understand what food labels on packaging show and gather information from food labels to help them to answer questions. In this unit, children also explore the different types of skeletons that animals have and compare these. They learn some names of bones in the human body and carry out an investigation to explore if people with longer femurs jump further.

What do animals need to survive and grow?

- Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food

Why do humans and some other animals have skeletons and muscles?

What are some of the bones in the human body?

Science – Forces, Friction and magnetic attraction - Year 3 Unit

In Lower KS2 we learn about…

National Curriculum Expectation

Forces and magnets

compare how things move on different surfaces
notice that some forces need contact between 2 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 2 poles
predict whether 2 magnets will attract or repel each other, depending on which poles are facing

Sugested Teaching Material

This 'Forces and Magnets' unit will teach your class about forces, friction and magnetic attraction. They will learn about forces in the context of pushing and pulling, and will identify different actions as pushes or pulls. The children will work scientifically and collaboratively to investigate friction, by exploring the movement of a toy car over different surfaces. They will work in a hands on way to identify magnetic materials. Furthermore, they will conduct an investigation into the strength of different types of magnet.

How can we use pushes and pulls to move an object?

How does the effect of friction slow down or speed up movement?

Why do magnets attract or repel each other?

Why are they attracted to some materials and not others?

Science – Rocks! - Year 3 unit

In Lower KS2 we learn about…

National Curriculum Expectation

Rocks
Pupils should be taught to:

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

Sugested Teaching Material

In this unit, children will discover the different types of rocks and how they are formed. Children will compare and group rocks based on appearance and simple properties. They will learn how fossils are formed and learn about the contribution of Mary Anning to the field of palaeontology. Children will understand how soil is formed and then investigate the permeability of different types of soil.#

Why do Rocks look different?

How are different rocks formed?

- Sedimentary, Metamorphic, Igneous

How are fossils made over time?

What is our soil made from and how is it made?

Science – Investigating Plants - Year 3 Unit

In Lower KS2 we learn about…

National Curriculum Expectation

Plants
Pupils should be taught to:

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

Sugested Teaching Material

This 'Plants' unit will teach your class about everything they need to know about plants. They will learn the names of different parts of plants, and the jobs they do. The children will work scientifically and collaboratively to investigate what plants need to grow well, and will present their findings to their classmates. Furthermore, they will have chance to predict what will happen in an exciting investigation into the transportation of water within plants.

What are the functions of different parts of flowering plants?

- : roots, stem/trunk, leaves and flowers

What do plants need to grow well?

How is water transported to the plants?

What is the life cycle of a flowering plant?

- pollination, seed formation and seed dispersal

Science – Light, reflection and Shadows - Year 3 Unit

In Lower KS2 we learn about…

National Curriculum Expectation

Light
Pupils should be taught to:

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

Sugested Teaching Material

This 'Light' unit will teach your class about light, reflections and shadows. They will learn about different sources of light, and that we need light to see. The children will work scientifically and collaboratively to investigate reflective materials, in the context of designing a new book bag. They will work in a hands on way to play a range of mirror games, finding out more about reflective surfaces. Furthermore, they will learn that the sun's light can be dangerous, and will create an advert for a pair of sunglasses or a sun hat that they have designed. The children will have chance to test which objects are opaque in an exciting investigation to design the most effective curtains, and will find out how shadows change when the distance between the object and light source changes.

How do we use light to help us to see?

Why some surfaces reflective and others are not?

How can we stay safe from the sun's rays?

How are shadows made and why do they change shape?

Science – Working Scientifically (Electricity) Year A

In Upper KS2 we learn about…

National Curriculum Expectation

Working scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

asking relevant questions and using different types of scientific enquiries to answer them setting up simple practical enquiries, comparative and fair tests making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers gathering, recording, classifying and presenting 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 reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions using 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 using straightforward scientific evidence to answer questions or to support their findings.

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What is science?

(Asking scientific questions)

How can I plan a fair scientific test controlling the dependent and independent variables?

What does it mean to accurately observe and using a range of scientific equipment?

How can I gather and record data of increasing complexity?

(Bar charts, line graphs and tables)

How can I use evidence to support or refute ideas?

How can I use test results to make predications for further investigations?

How can you present your findings in the form of displays and presentations?

Sugested Teaching Material

Science – Puberty and Old Age

In Upper KS2 we learn about…	
National Curriculum Expectation **Animals, including humans** **Pupils should be taught to:** **describe the changes as humans develop to old age** Sugested Teaching Material	*This unit focuses on the changes that human beings experience as they develop to old age. It tackles some sensitive subjects including puberty and death. As such, it is advisable to consult your school sex and relationships education policy prior to teaching this unit. Children will learn about the life cycle of a human being. They will investigate the development of babies and compare the gestation period of humans and other animals. They will learn about the changes experienced during puberty and why these occur.* **How do humans change as they grow old?** **How do humans develop in the womb?** **What changes happen to the body during puberty?** **How does the human gestation period compare to other gestation periods?**

Science – States of Matter - Year 4 Unit

In Upper KS2 we learn about…

National Curriculum Expectation

States of matter
Pupils should be taught to:

compare and group materials together, according to whether they are solids, liquids or gases
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)
identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

Sugested Teaching Material

This 'States of Matter' unit will teach your class about the differences between solids, liquids and gases, classifying objects and identifying their properties. The children will work scientifically and collaboratively to investigate the weight of a gas. Furthermore, they will have chance to find the ideal temperature to melt chocolate. They will explore in-depth how water changes state, exploring melting, freezing, condensing as well as a particular focus on evaporation. Finally, they will learn about the stages of the water cycle, creating mini water worlds and an interactive water wheel to represent the different stages.

What are the different properties of a solid, a liquid or a gas?

What impact does heating and cooling have on changes in states of matter?

What is evaporation and what part does it play in the water cycle?

What parts do evaporation and condensation play in our water cycle?

Science – Life Cycles of Plants and Animals - Year 5 and 6 Unit

In Upper KS2 we learn about…

National Curriculum Expectation

Living things and their habitats

Pupils should be taught to:

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

Living things and their habitats

Pupils should be taught to:

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
give reasons for classifying plants and animals based on specific characteristics

Sugested Teaching Material

This 'Living Things and Their Habitats' unit will teach your class about the process of reproduction and the life cycles of plants, mammals, amphibians, insects and birds. The children will explore reproduction in different plants, including different methods of pollination and asexual reproduction. They will recap their work in Year 3 by playing a game to name the parts of a flower. The children will have the opportunity to take cuttings from plants, creating clones of the parent plant. They will learn about different types of mammals and their different life cycles, making life cycle wheels to present their learning.

How do plants and animals reproduce using sexual reproduction?

What is asexual reproduction and how is this different to sexual reproduction?

How does the lifecycle of mammals, insects and birds compare with each other?

What are the differences in the life cycles of an amphibian and an insect?

- complete and incomplete metamorphosis.

Science – Earth and Space - Year 5 Unit

In Upper KS2 we learn about…

National Curriculum Expectation

Earth and space

Pupils should be taught to:

describe the movement of the Earth and other planets relative to the sun in the solar system
describe the movement of the moon relative to the Earth
describe the sun, Earth and moon as approximately spherical bodies
use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

Sugested Teaching Material

This unit is the only Astronomy related science unit in the primary science curriculum. The aim is to give children a basic overview of Earth and its place in our Solar System.

What shapes are the planets in our solar system?

- Sun, Earth and Moon as approximately spherical bodies

What are the planets in our solar system and how do they move around the Sun?

Why do we experience night and day?

Why do we experience different Moon phases?

Science – Evolution and Inheritance

In Upper KS2 we learn about…

National Curriculum Expectation

Evolution and inheritance
Pupils should be taught to:

recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Sugested Teaching Material

This unit builds on the children's learning from the Year 3 Rocks unit as well as the Animals including Humans and Living Things and their Habitats units. As such, it is important that children have the appropriate understanding of fossils, habitats and human development in order to grasp the concepts and ideas presented to them in these lessons. Children will learn about variation and adaptation. They will be able to explore how both Charles Darwin and Alfred Wallace separately developed their theories of evolution. They will examine the scientific evidence from plants and animals that has been gathered to support the theory of evolution.

Why do living things produce offspring of the same kind, but normally are not identical to their parents?

Why and how do animals and plants adapt to suit their environment?

What did Charles Darwin tell us about his theory of evolution?

What evidence is there for the Theory Of Evolution?

Science – Working Scientifically (Light) Year B

In Upper KS2 we learn about…	
National Curriculum Expectation **Working scientifically** **During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:** **asking relevant questions and using different types of scientific enquiries to answer them setting up simple practical enquiries, comparative and fair tests making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers gathering, recording, classifying and presenting 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 reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions using 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 using straightforward scientific evidence to answer questions or to support their findings.**	**What is science?** (Asking scientific questions) **How can I plan a fair scientific test controlling the dependent and independent variables?** **What does it mean to accurately observe and using a range of scientific equipment?** **How can I gather and record data of increasing complexity?** (Bar charts, line graphs and tables) **How can I use evidence to support or refute ideas?** **How can I use test results to make predications for further investigations?** **How can you present your findings in the form of displays and presentations?**

Science – Vertebrates and Invertebrates - Year 4 Unit

In Upper KS2 we learn about…

National Curriculum Expectation

Living things and their habitats
Pupils should be taught to:

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

Sugested Teaching Material

In this unit children explore a variety of ways to identify, sort, group and classify living things. They learn how animals are split into 'vertebrates' and 'invertebrates' and begin to consider the differences between living things within these classifications. They use and create classification keys to group, identify and name living things from the local habitat and beyond. This unit also introduces children to the idea that environments are subject to human-made and natural changes, and that these changes can have a significant impact on living things.

How do we group living things in a range of ways?

What are the features of a vertebrate?

What are the features of an invertebrate?

What vertebrates and invertebrates live in our local areas?

Science – Gears, Pulleys and Leavers - Year 5 Unit

In Upper KS2 we learn about…

National Curriculum Expectation

Forces
Pupils should be taught to:

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
identify the effects of air resistance, water resistance and friction, that act between moving surfaces

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

Sugested Teaching Material

This 'Forces' unit will teach your class about types of forces such as gravity, friction, water resistance and air resistance. Children will also learn about the use of mechanisms such as levers, gears and pulleys. The children will identify forces and find out about Isaac Newton and his discoveries about gravity, completing a comprehension about his life and his work. The children will look for patterns and links between the mass and weight of objects, using newton meters to measure the force of gravity. They will also work collaboratively to investigate air and water resistance, participating in challenges to design the best parachute and boat.

Why do objects fall towards the Earth?

What impact does air resistance have on objects?

What impact does air resistance have on objects?

What are the impacts of friction on objects?

Science – Mixtures and irreversible changes - Year 5 Unit

In Upper KS2 we learn about…

National Curriculum Expectation

Properties and changes of materials

Pupils should be taught to:

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
know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
demonstrate that dissolving, mixing and changes of state are reversible changes
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

Sugested Teaching Material

The children will sort and classify objects according to their properties. They will explore the properties of materials to find the most suitable material for different purposes. The children will work scientifically and collaboratively to investigate the best thermal insulator to make a lunch box, making predictions and forming conclusions.

Which materials are good thermal insulators?

- insulators and conductors

Which materials are soluble in water?

- Dissolving, solution, mixing

Why are some changes reversible, and others are irreversible?

Science – Puberty and Diet, Exercise and Lifestyle – Year 5 and 6 Unit

In Upper KS2 we learn about…

National Curriculum Expectation

Animals, including humans

Pupils should be taught to:

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

Year 6

Pupils should be taught to:

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

Sugested Teaching Material

This unit recaps the children's learning from year 4 about how animals survive and stay healthy and helps children to learn more about how different organ systems work. This unit teaches the importance of diet, exercise and lifestyle in the way that bodies function. In this unit, they learn about the three main parts of the circulatory system and the job of the heart. They also learn about what blood is comprised of and how it is transported around the body. Children carry out an investigation to explore how heart rate is affected by exercise.

How does the heart and the circulatory system work?

What is our blood made of?

How does our Digestive System work?

What part do our teeth play in digestion?

Why is it important to have regular exercise and eat healthy food?

Science – Sound, pitch and volume - Year 4 Unit

In Upper KS2 we learn about…

National Curriculum Expectation

Sound
Pupils should be taught to:

identify how sounds are made, associating some of them with something vibrating
recognise that vibrations from sounds travel through a medium to the ear
find patterns between the pitch of a sound and features of the object that produced it
find patterns between the volume of a sound and the strength of the vibrations that produced it
recognise that sounds get fainter as the distance from the sound source increases

Sugested Teaching Material

The children will learn about how sounds are made, carrying out demonstrations of vibrations, and completing a sound survey of their school. They will work in groups to create a human model of the way particles pass sound vibrations on, and write and star in their own documentary explaining how sound travels. The children will work in a hands-on way to explore pitch, and will use their understanding of how high and low sounds are made to create their own set of pan pipes.

How are sounds made and how do they travel?

How does the ear work to enable us to hear sounds?

How does the pitch change the way sounds moves?

How can we prove that sound vibrations can travel through materials?