Science

Intent,
Implementation,
Impact

Contents

Y1 - Aut 1: Materials – What are everyday materials?

1. What is science?	
Intent	Children will understand that science is the term used to explore the world around them and start to discover links with how things change, grow and work.
Implementation	Children to discuss through modelled examples and questions (Wonder Wall) what science is and how it impacts on their lives and understanding of the world around them.
2. What are everyday materials?	
Intent	Children will be able to name common everyday objects and identify the material that it is made from.
Implementation	Children to sort and label a range of objects by the material that they were made from
3. What are the properties of everyday materials?	
Intent	Children will understand the term properties and will be able to identify the simple properties of materials.
Implementation	Children to feel a range of objects in a feely bag and describe the properties of materials. They will list the properties of materials and identify if some materials have more than one property.
4. How are everyday materials grouped?	
Intent	Children test objects to identify those with similar properties and group them.
Implementation	Children to test a range of objects and find which objects are waterproof, which float or sink. Children will be able to group together objects that share the same properties.
5. What is an experiment?	
Intent	Children to understand that science experiments can help them find out more about the world around them.
Implementation	Children to take part in simple experiments and tests to find out more about everyday materials and their properties.
Impact	Children will be able to accurately name and identify the material that an object is made from. They will be able identify the simple properties of a range of everyday materials and discuss why materials have been selected for a particular purpose. Children will start to understand what science is and how experiments an help in their understanding of the world around them.

Year 1 - Science: Seasonal changes **How do Seasons change? (Autumn / Winter)**	
1. What is Science and its relationship with the four Seasons?	
Intent	Children will understand the term relationship and explore an answer to the question
Implementation	Children to annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz Children to name the four seasons and identify what is different about each season.
2. What is weather like in each season?	
Intent	Identify the most common weather in each season
Implementation	Match photographs of weather to each season and describe them. Children to go on Wellie walks in each season to identify the changes that they see around them first hand.
3. How are animals affected by the seasons?	
Intent	Children to learn how animals have to adapt and change their behaviour in order to survive in the different seasons
Implementation	Children to describe what an animal does in each season.
4. How are humans affected by the seasons?	
Intent	Children to learn how humans have to adapt and change their behaviour in order to survive in the different seasons
Implementation	Children to sort which clothes they have to wear in each season and describe why they have made that choice.
5. How is day length affected by the seasons?	
Intent	To identify that it is not just the weather that changes during the seasons, that it also has an effect on the length of the day.
Implementation	Children investigate what happens to the day length in each season. Which season has the longest day and the shortest day?
6. What is a weather station?	
Intent	Children to identify what a weather station is and what it does.
Implementation	Children to use a weather station to record the weather over the course of a week. Repeat this in each of the seasons to enable children to identify changes to the weather. Children will complete a post-quiz
Impact	Be able to identify the four seasons in the UK. Be able to identify which weather and clothes are matched to each season. Be able to identify the effect that seasons have on animals including humans and what they have to do in order to adapt to their environment.

Year 1 Science - Seasonal changes

How do Seasons change? (Spring / Summer)

1. What is Science and its relationship with the four Seasons?	
Intent	Children will understand the term relationship and explore an answer the question
Implementation	Children to annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz Children to name the four seasons and identify what is different about each season.
2. What is weather like in each season?	
Intent	Identify the most common weather in each season
Implementation	Match photographs of weather to each season and describe them. Children to go on Wellie walks in each season to identify the changes that they see around them first hand.
3. How are animals affected by the seasons?	
Intent	Children to learn how animals have to adapt and change their behaviour in order to survive in the different seasons
Implementation	Children to describe what an animal does in each season.
4. How are humans affected by the seasons?	
Intent	Children to learn how humans have to adapt and change their behaviour in order to survive in the different seasons
Implementation	Children to sort which clothes they wear in each season and describe why they have made that choice.
5. What is a weather station	
Intent	Children to identify what a weather station is and what it does.
Implementation	Children to use a weather station to record the weather over the course of a week. Repeat this in each of the seasons to enable children to identify changes to the weather. Children will complete a post-quiz
Impact	Be able to identify the four seasons in the UK. Be able to identify which weather and clothes are matched to each season. Be able to identify the effect that seasons have on animals including humans and what they have to do in order to adapt to their environment.

Year 1 Science - Animals including humans

How do we group animals?

1. What is Science and why do we group animals?	
Intent	Children will understand the term relationship and explore an answer to the question
Implementation	Children to annotate the Knowledge Organiser with prior knowledge Children to complete a pre-quiz
2. What are mammals?	
Intent	To be able to identify and name a variety of common UK mammals
Implementation	Children will identify a variety of mammals and compare and describe some of their features.
3. How are birds, fish and amphibians and reptiles different?	
Intent	To be able to identify and compare a variety of common UK birds, fish amphibians and reptiles.
Implementation	Children will compare the characteristics of a variety of birds and reptiles, then answer questions or describe animals in their own words. Children will consider similarities and differences between some fish and amphibians. They will also learn about some fish/amphibian life cycles and describe what they have learned in their own words
4. What are the parts of animal bodies called?	
Intent	To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)
Implementation	Children identify the different names for parts of animal bodies. Children to label the parts of a variety of animal bodies. Children to compare the skeletons of different animals. What is similar, what is different?
5. What are the parts of my body called?	
Intent	To identify, name, draw and label the basic parts of the human body
Implementation	Children will draw and label a picture of their body
6. What are carnivores, herbivores and omnivores?	
Intent	To identify and name a variety of common animals that are carnivores, herbivores and omnivores
Implementation	Children will describe what a variety of different animals eat, then sort animals using *Venn* diagrams or tables. Children will match foods to different animals. Children will identify what food animals need in order to keep healthy. Children will complete a post-quiz
Impact	Be able to name the groups of the animal kingdom. Be able to name and describe a range of common animals from the UK and some from the wider world. Be able to name parts of animal bodies, including humans. Understand the term carnivore, omnivore, and herbivore. Be able to explain what animals eat and how to ensure that they are healthy.

Year 1 Science - Plants

How do we identify plants?

1. What is Science and its relationship with Plants?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. What plants grow in my garden?	
Intent	To identify and describe garden plants.
Implementation	Children will look at a variety of plants and trees. Children will label pictures with their names and decide whether they are a plant or a tree. Children to draw and label a plant that grows in their garden. Can they identify if it is a plant or a tree?
3. What plants grow in the wild?	
Intent	To identify and describe wild plants.
Implementation	Children will use a classification key to identify a variety of plants. Then they will stick the plant in the correct place on their key. Children will play plant dominoes.
4. Do trees have leaves all year?	
Intent	To identify and describe a range of trees.
Implementation	Children to sort the trees into groups of evergreen and deciduous. They will write a sentence explaining what evergreen and deciduous mean. Can they name any evergreen or deciduous trees? Children will go on a tree identification walk. They will use the key to identify trees within the school grounds.
5. What are the different parts of a plant called?	
Intent	To identify the different parts of a plant.
Implementation	Children to complete the drawing of a tree and of a small flowering plant. Children will write a description to describe the parts of the plant.
6. What is the life cycle of a plant?	
Intent	To make observations of growing plants.
Implementation	Children to record what their plant was like when they planted it and what it is like now. Write a sentence explaining how it has changed. Children to complete a split pin seed story wheel and add captions to describe what happens to the seed. Children will complete a post-quiz
Impact	Be able to describe how to plant a bean. Be able to identify and name some common garden and wild plants. Be able to identify some common British trees and say whether they are deciduous or evergreen. Be able to label simple parts of plants and trees. Be able to explain the life cycle of a plant and describe some of the changes that happen as a plant grows.

Year 2 Science - Plants

How do Plants grow?

1. What is Science and its relationship with Plants?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. What are the main parts of a plant?	
Intent	Children will know the main parts of a plant and their function.
Implementation	Match the correct parts of the plant to their meaning.
3. What do plants need to grow and survive?	
Intent	Children will know what plants need to survive.
Implementation	Look at the results of their comparative test. Measure the growth of cress with a ruler. Record the growth of cress by drawing or writing.
4. Can we make scientific observations?	
Intent	Children will use simple and appropriate scientific language and terminology to talk about what has been found out.
Implementation	Investigate what constitutes a scientific and unscientific observation. Practise making observations scientific/specific/measured/quantitative. Sort pre-written observations into scientific/unscientific categories.
5. What is the Life cycle of a plant?	
Intent	Children will know the life cycle of a plant. Children will know a way we can tell that plants are living things?
Implementation	Describe and order the stages in the life cycle of a plant. Look at life processes. Children will complete a post-quiz
Impact	Know that seeds/bulbs need water/air/suitable temp to germinate. Identify and name the petal/leaf /anther/stem/root and explain their function. Know that a plant needs light, water, carbon dioxide/warmth to grow and survive. Be able to write their own scientific opinion about a plant using appropriate scientific language and terminology. Recall the main stages in the life cycle of common plants and explain something plants do that shows us that plants are living things.

Year 2 Science - Everyday materials

Why do we use everyday materials?

1. What is Science and its relationship with a range of materials?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. What are the properties of a variety of materials?	
Intent	Children will be able to distinguish between an object and the material from which it is made. Children will know the simple physical properties of some materials.
Implementation	Look at a selection of items, identify the different materials they are made from and identify their physical properties. Compare and group together a variety of everyday materials on the basis of their simple physical properties.
3. Why might a certain material not be useful?	
Intent	Children will know the uses of different everyday materials.
Implementation	Record uses of different everyday materials using a grid format and photo cards. Investigate what would happen if we changed the material of their items. What is their hypothesis?
4. Can we compare the suitability of some materials?	
Intent	Children will know the suitability of different everyday materials.
Implementation	Identify materials (wood, metal, plastic, glass, brick, rock, paper and cardboard) and ascertain the most appropriate material for particular uses (using scientific vocabulary i.e. transparent, opaque, durable, rigid, permeable, etc.).
5. How can materials be changed?	
Intent	Children will know how the shapes of objects made from some materials can be changed.
Implementation	Observe a selection of objects, how could the shape be changed? Explore/record changing the shape of the objects by gently squashing, bending, twisting or stretching them. Children will complete a post-quiz
Impact	Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Use scientific vocabulary i.e. transparent, opaque, etc and identify the uses of everyday materials. Know which properties make some materials suitable for different purposes and know which properties make some materials unsuitable for different purposes. Be able to explain why different materials can be used to make the same object and know and demonstrate ways the shapes of some objects can be changed.

Year 2 Science - Living things and habitats

What is a living thing and where do they live?

1. What is Science and its relationship with an organism?	
Intent	Children will understand the term relationship Children will develop and answer to the question
Implementation	Children to annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. What is a habitat?	
Intent	Children will know what a habitat is.
Implementation	Children will visit a local habitat and look at it closely to see what kinds of plants, animals and non-living things are in it. Observe and record using mapping and labelling skills.
3. Why do animals live in specific habitats?	
Intent	Children can describe a habitat and identify the animals that live in it.
Implementation	Children will identify how an animal is suited to its habitat by asking the question 'How do I survive?'
4. Can we match living things to their habitats?	
Intent	Children can identify microhabitats and name the minibeasts found there.
Implementation	Children will use findings to compare 2 microhabitats.
5. How do animals find their food?	
Intent	Children will know how living things in a habitat depend on each other.
Implementation	Children will label animals in different habitats dependency.
6. What is a food chain?	
Intent	Children can use a food chain to show how animals get their food.
Implementation	Children will draw food chains and identify the habitat they would find them in. Children will complete a post-quiz
Impact	Explain how life processes can tell us if something is living, dead or has never been alive. Know that a habitat is a place where animals and plants live and where they can find everything they need to stay alive. Be able to describe a world habitat (Rainforest, Arctic, Ocean, Desert) and identify the animals that live in it and know that most living things live in habitats to which they are suited. Be able to describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Order living things in a food chain (producer, consumer, predator).

Year 2 Science - Animals including humans

What do animals need to survive?

1. What is Science and its relationship with the stages in an animal's life cycle?	
Intent	Children will understand the term relationship and will develop and answer to the question.
Implementation	Children to annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. What are the names of different animals young?	
Intent	Children will know how animals change as they grow. Children will know the names of animals and their young.
Implementation	Investigate how animals grow (mammals, birds, amphibians, reptiles). Match animals and their babies (mammals, birds, amphibians, reptiles).
3. What do animals and humans need to survive?	
Intent	Children will know the 3 basic needs of animals, including humans. Children know the difference between carnivores, herbivores and omnivores.
Implementation	Describe the basic needs of humans and other animals by labelling.
4. How can we look after our bodies?	
Intent	Children will know the importance of exercise, healthy eating and keeping clean.
Implementation	Explore and record the effects exercise has on the human body. Design a menu that has the right amount of each food type. Hygiene Hero's Game. Use a magnifying glass to look closely and record what is seen. (Glitter Bugs) Children will complete a post-quiz
Impact	Name the different life stages in the human timeline (baby, toddler, child, teenager, adult, elderly) and know key features of what humans are like during the different stages of their lives. Describe the main changes as young animal offspring grow into adults (at least: between egg and adult bird; between egg and adult insect; between baby and adult mammal) and name animals and their young. Demonstrate their knowledge in describing the basic needs of animals, including humans, for survival (water, food and air). Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Year 3/4 Plan A: Science - Sound

How is sound made and changed and how do I hear?

1. What is Science and its relationship with Sounds?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. How do sounds get to my ear?	
Intent	Children will recognise that vibrations from sounds travel through a medium to the ear.
Implementation	Put pictures in correct order starting with vibrations pass from the sound source to particles in the air.
3. What is pitch and how is it changed?	
Intent	Children will find patterns between the pitch of a sound and the features of the object that produced it.
Implementation	Design an instrument on which children can demonstrate pitch change. Children write an explanation of what happens to the parts of the instrument that vibrate in order for the pitch to change.
4. How does volume change?	
Intent	Children will find patterns between the volume of a sound and the strength of the vibrations that produced it.
Implementation	Investigate sound-proofing materials by planning and conducting a fair test, considering all the variables and how to record the results
5. What happens to sound when you get further away from it?	
Intent	Children will recognise that sounds get fainter as the distance from the sound increases.
Implementation	Investigate what happens to volume when you move away from the sound source. Write an explanation of how to change volume. Children will complete a post-quiz
Impact	Understand that sound is made when something vibrates. Understand how sound travels and what happens in our ear. Know what pitch and volume is and how it can be changed.

Year 3/4 Plan A: Science - States of matter **What is a state of matter?**	
1. What is Science and its relationship with States of Matter?	
Intent	Children will understand the terms relationship, States of Matter, and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. How do I measure temperature?	
Intent	Children will observe that some materials change state when they are heated/ cooled.
Implementation	Children observe that some materials change state when they are heated or cooled. They measure the temperature at which this happens in degrees Celcius.
3. What happens to water when it is heated and cooled?	
Intent	Children will understand what happens to water and measure the temperature at which this happens.
Implementation	Children observe a kettle boiling with coloured water in it. Teacher catches the steam on a white board and children will be able to see that there are coloured water droplets on there. Write up findings in book.
4. What is the water cycle?	
Intent	Children will identify how evaporation and condensation are linked with the water cycle.
Implementation	Children draw the water cycle in books, labelling with scientific vocabulary. Children will complete a post-quiz
Impact	Understand what the differences are between solids, liquids and gases. Observe that some materials change state when they are heated and cooled. Use their understanding to explain the water cycle.

Year 3/4 Plan A: - Electricity **How do we make a circuit work?**	
1. What is Science and its relationship with electricity?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. What components make up an electrical circuit?	
Intent	Children will understand what components are needed to make an electrical circuit.
Implementation	Children will make simple electrical circuits identifying and naming basic parts, including cells, wires, bulbs, switches and buzzers.
3. When does an electrical circuit work and not work?	
Intent	Children be able to identify the components needed to make a working circuit.
Implementation	Investigate how to make a working circuit and experiment by adding different components.
4. How does a switch work?	
Intent	Children will recognise that an open switch breaks a circuit and a closed switch completes a circuit.
Implementation	Investigate how to make a switch using a piece of card, a metal paper clip and two split pins. Record using symbols in book along with explanation of an off switch makes a gap in the circuit and an on switch creates a complete circuit.
5. What are common insulators and conductors of electricity?	
Intent	Children will recognise common insulators and conductors. They will associate metals as good conductors.
Implementation	Test materials in a circuit to sort conductors and insulators and record results in a table. Children will complete a post-quiz
Impact	Identify appliances that need electricity to work. Understand that an electrical circuit needs a power source and needs to be complete in order to work. They will understand that if there is a break in the circuit, the electricity won't flow. Recognise and name insulators and conductors of electricity.

Year 3/4 Plan A: Science - Living things and their habitats **What classification of animals live where?**	
1. What is Science its relationship with Living things and their habitats?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. What is a classification key?	
Intent	Children will be able to use a classification key to group, identify and name oa variety of living things.
Implementation	Children complete classification keys using headings such as mammals, invertebrates etc.
3. How can environmental change endanger living things?	
Intent	Children will recognise that environments can change and these changes can pose a danger to living things.
Implementation	Children research a recent news story that focuses on environmental change and the affect it has had on living things. They report back to their peers with their findings using a PowerPoint presentation. Children will complete a post-quiz
Impact	Understand that animals (including humans) can be grouped. Consider features that will help to classify them. Understanding how environmental change can endanger living things as well as understand what positive changes humans can make to protect living things.

Year 3/4 Plan A:Science - Animals including humans **How do humans process food?**	
1. What is Science and its relationship with the Food Chain?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. What parts make up the human digestive system?	
Intent	
Implementation	Children explore the human digestive system by creating a model (using tights, banana, orange juice etc.) and then write an explanation.
3. What is a food chain?	
Intent	Children will construct and interpret food chains, identifying producers, predators and prey.
Implementation	Children investigate food chains and record examples in books. Children will complete a post-quiz
Impact	Be able to name and understand the functions of different teeth. Know what happens to food when it enters the body. Understand that all food chains start with a plant and end with a top predator.

Year 3/4 Plan B Science - Rocks

How are rocks formed?

1. What is Science and its relationship with the formation of Rocks?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. How are rocks different from each other?	
Intent	Children will be able to identify different properties of rocks, using scientific vocabulary such as, permeable, impermeable, light, heavy, rough and smooth.
Implementation	To conduct a scientific investigation comparing different rocks and their properties.
3. What is a fossil?	
Intent	Children will develop an understanding of what a fossil is and the fossilisation process.
Implementation	Sequencing of pictures of the fossilisation process and identify common fossils, such as an ammonite
4. What can we learn from fossils?	
Intent	Children will be able to explain how studying rocks and fossils can tell us things about the history of our Earth and the animals that live/lived on it.
Implementation	An investigation into the methods of palaeontology and geology
5. What is dirt made from?	
Intent	Children will know that dirt is made up of layers, with many components and that there are different types of soil.
Implementation	Creating a model of sedimentary soil to investigate the components and creating a scientific drawing of the model, with labelled components. Children will complete a post-quiz
Impact	Build upon their understanding of our Earth and how it has been formed and changed. Have the opportunity to work scientifically, conducting basic investigations. Be able to use this understanding and investigation to analyse rocks and identify fossils, with discussion as to how they were formed. Develop an awareness of relevant fields of science and how they operate, using vocabulary such as palaeontology and geology.

Year 3/4 Plan B: Science - Forces and magnets **What is a force?**	
1. What is Science and its relationship with forces?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. What is magnetic force?	
Intent	Children will understand how magnetic forces and fields work using vocabulary of attraction and repulsion.
Implementation	An introduction to magnets and an investigation into how and why they attract and repel other magnets.
3. What objects attract or repel magnets?	
Intent	Children will explain what the scientific model is and what a fair test is and why they are important for science experiments. Children will know that somethings are attracted to a magnet and some are not and begin to predict this.
Implementation	Scientific experiment testing magnets against everyday items.
4. How do magnetic poles affect how magnets work?	
Intent	Children will research how magnets and magnetic fields relate to magnetic poles and understand how that force impacts certain aspects of our world.
Implementation	A research project Children will complete a post-quiz
Impact	Be able to describe what a force is and how they are influenced by different conditions. Understand magnetic forces, their attraction and repulsion and how the force of that varies, using vocabulary of forces, fields and poles.

Year 3/4 Plan B- Light Why is light important?	
1. What is Science and its relationship to light?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. What is reflection?	
Intent	Children will understand how reflection occurs and from what sort of surfaces. They will also begin to develop an understanding of how reflection influences light.
Implementation	An investigation into how and why light reflects from some surfaces and not others.
3. How are shadows formed?	
Intent	Children will explain how and when shadows are formed.
Implementation	Scientific experiment creating shadows in different situations.
4. Why do shadows change size?	
Intent	Children will research how changes in shadows can be made by changing certain factors.
Implementation	Scientific experiment creating a fair test to influence the size of the shadow.
5. How is light from the sun dangerous?	
Intent	Children will research how light from the sun can be dangerous and how they can protect themselves from the dangers.
Implementation	A research project where children will present the dangers of light and how they can protect their eyes. Children will complete a post-quiz
Impact	Recognise they need light in order to see things and dark is the absence of light. Notice that light is reflected from surfaces. Recognise that shadows are formed when light is blocked by a sold object and find patterns in the way shadows change in size.

Year 3/4 Plan B: Science - Plants

How do plants keep themselves alive?

1. What is Science and its relationship to Plants?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. What job does each part of the plant do?	
Intent	Children will be able to identify what the main function of each of the main parts of a plant is.
Implementation	Children will write descriptions for each of the functions of the main parts of the plants.
3. What are the stages of a plant's life cycle?	
Intent	Children will recap prior knowledge of a lifecycle and develop an understanding the process of a plant's lifecycle.
Implementation	Sequencing of pictures of the plants lifecycle and writing a description for each stage.
4. What does a plant need to grow?	
Intent	Children will be able to explain how different conditions affect the growth of plants and will know what conditions are optimal for plants to grow. Children will recap different soil types and will consider the effect this might have on a plants growth.
Implementation	An investigation, in small groups, into the best conditions for plants to grow in.
5. How does water travel through a plant?	
Intent	Children will recap the importance of well hydrated soil and roots, and will investigate the process of water travelling through a plant. Children will begin to know how to set up their own experiment.
Implementation	Children will plan and conduct an experiment as to how we can observe how water travels through a plant. Children will complete a post-quiz
Impact	Build upon their understand of plants, their parts and their lifecycles. Have the opportunity to work scientifically, conducting basic investigations. Be able to use this understanding and investigation to analyse what plants need to grow and how plants absorb water. Develop an awareness of relevant fields of science and how they operate, using vocabulary such as biology and botany.

Year 3/4 Plan B: Science - Animals including humans

How do humans and other animals work?

1. What Science and its relationship to grouping animals?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. How do human muscles work?	
Intent	Children will be able to identify what the main function of human muscles is.
Implementation	Children will assemble a picture of a human muscular system, labelling the main muscles. They will also write a paragraph about how muscles work.
3. What is nutrition?	
Intent	Children will recap prior knowledge of nutrition and develop an understanding of what different animals need to thrive.
Implementation	Children will compare dietary needs of a selection of different animals. They will answer questions about the animals needs and draw conclusions from this comparison.
4. What nutrition is good for humans?	
Intent	Children will be able to explain how different types of nutrition affect the growth and energy levels of humans and will know what nutrition is optimal for humans to grow and thrive.
Implementation	In small groups children will investigate the nutritional value of different foods, using this investigation they will create balanced meals justifying why each food is important for humans. Children will complete a post-quiz
Impact	Build upon their understanding of nutrition and its impact on animals including humans. Have the opportunity to work scientifically, conducting basic investigations. Be able to use this understanding and investigation to analyse what humans need to grow and thrive. Develop an awareness of relevant fields of science and how they operate, using vocabulary such as biology and nutritionist.

Y5/6 Science Plan A -Evolution **How has life evolved?**	
1. What is Science and its relationship with Evolution?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. How do animals and plants adapt to suit their environment?	
Intent	Children will know that animals have evolved and adapted over time to suit their environment.
Implementation	Children will look at a range of plants and animals and explain characteristics that each have to suit the environment they live in.
3. What is evolution?	
Intent	Children will use the work of scientists to understand the process of evolution. Children will understand how fossils can be used as evidence to study changes over time.
Implementation	To look at the work of scientists and recognise how they have helped us to develop our understanding of evolution. Children will examine fossils to explain how they can be used to identify how living things have changed over time. Children will complete a post-quiz
Impact	Understand the term evolution and the important research Charles Darwin's undertook, recalling key points regarding his theories. Be able to link characteristics and traits along family lines, in humans, animals and plants and how they need to adapt to suit their environments.

Year 5/6 Science Plan A - Animals Including Humans **How do we keep our heart healthy ?**	
1. What is Science and its relationship with Humans?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. How are nutrients and water transported within humans and animals?	
Intent	Children will know how nutrients are transported in humans and other animals.
Implementation	Children will sort statements to describe how nutrients are transported around the body. They will understand and be able to use correct terminology to explain the process of transporting nutrients around the circulatory system.
3. What is the impact of diet, exercise and drugs on our bodies?	
Intent	Children will be able to explain how diet, exercise and drugs affect our bodies and lifestyle.
Implementation	Children will identify the different food groups and examples of foods that are in each of the groups. They will look at the effects different amounts and types of foods have on their bodies. Children will look at the effect of exercise on their bodies and identify the benefits of exercise. Children will be able to identify what drugs are and how they can effect body functions. Children will complete a post-quiz
Impact	Describe the way nutrients and water are transported within animals including humans. Identify the main parts of the human circulatory system and describe the functions of the main parts. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.

Year 5/6 Science Plan A - Electricity **How can we vary electrical circuits?**	
1. What is Science and its relationship with Electricity?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. What happens when electrical components are changed?	
Intent	Children will be able to explain what happens when you add components into an electrical circuit.
Implementation	Children will investigate the effects of adding components into an electrical circuit and be able to justify reasons for this. Children will complete a post-quiz
Impact	Recognise components that will make a working circuit. Be able to represent each component with a symbols when drawing diagrams. Be able to explain how adding different components effect the circuit and justify why.

Year 5/6 Science Plan A - Light **How do we see?**	
1. What I Science and its relationship with Light?	
Intent	Children will understand the term relationship and develop and answer to the question
Implementation	Children will annotate the Knowledge Organiser with prior knowledge Children will complete a pre-quiz
2. How do we see objects?	
Intent	Children will be able to explain how light is needed in order for our eyes to see objects. They will be able to name different parts of the eye and their functions.
Implementation	Label a diagram of the cross section of the eye and explain the function each part has and how this enables us to see objects.
3. How do shadows change?	
Intent	Children will be able to explain how and why shadows change depending on the object/ light source.
Implementation	Children to plan and carry out an investigation about shadows. Children will decide on the criteria they would like to test and conduct a fair test in order to draw conclusions about how shadows change. Children will complete a post-quiz
Impact	Recognise that light travels in straight lines Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light from our eyes. Explain that we see things because light travels from light sources to objects then to our eyes. Be able to explain how shadows are formed and how they change depending on the position of the light source.

Y5/6 Plan B: Materials
How do materials change?

1. What are materials?	
Intent	Children to understand the sciences studied in school and how this impacts the wider world. To understand what materials are.
Implementation	Children will complete a pre-quiz on the topic and what they can recall from the previous units taught in school. Discuss and, where possible, annotate the KO.
2. What properties do every day materials have?	
Intent	To understand that materials have different properties and what those properties can be useful for.
Implementation	Use a range of everyday materials to test whether they are electrical insulators or conductors, thermal insulators or conductors, magnetic, transparent, translucent, opaque, flexible, waterproof, man-made or natural and the record their findings.
	Think about the different uses for the materials once they have identified their main properties and compare them for their suitability.
3. What is a solution?	
Intent	To understand that a solution is created when a solute is dissolved into a liquid
Implementation	Look at a range of common solutions and record what substances have been mixed in order to create the solutions
4. How can mixtures be separated?	
Intent	To understand that mixtures can be separated back into their individual components by filtering, evaporating and sieving.
Implementation	Investigate how best to separate a range of mixtures back into their individual components and conduct a fair test.
5. What are reversible and irreversible changes?	
Intent	To understand that some changes in materials are reversible, like freezing and melting water, some are irreversible, such as burning wood, and others create new materials.
Implementation	To watch video clips on different types of changes and to then discuss the different changes that have taken place. Carry out 3 different types of changes in the classroom and explain whether they are reversible, irreversible and whether they have created a new material or not.
Impact	**Children can compare and group together everyday materials on the basis of their properties.** **To know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.** **To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.** **To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.** **Children demonstrate that dissolving, mixing and changes of state are reversible changes.** **To 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.**

Year 5/6 Science Plan B – Earth and Space **How does the solar system move?**	
1. How do we know the Earth, Moon and Sun are approximately spherical shapes?	
Intent	Children will understand the Earth, sun and moon are approximately spherical shapes?
Implementation	Children will demonstrate an understanding of the sizes of the Earth, sun and moon using photographs and statements to support their understanding.
2. How do we have day and night?	
Intent	Children will explain how we have day and night, using key vocabulary e.g. rotation, axis, orbit.
Implementation	Children will label and explain through the use of diagrams.
3. How does the movement of the Earth alter daylight?	
Intent	Children will know the Earth orbits the sun and daylight hours are different depending on position of the Earth.
Implementation	Children will draw a graph of sunrise and sunset and draw conclusions (supported with a diagram)
4. What is a year?	
Intent	Children will understand the term a 'year' and how long a planet takes to orbit the sun.
Implementation	Children will extract information regarding the planets and length of a year.
5. How does the moon move in relation to the Earth?	
Intent	Children will know that the moon orbits the Earth in 28 days and will appear in different shapes depending on its orbit.
Implementation	Children will label and explain the moon and its different phases using scientific vocabulary.
Impact	Children will: • Be able 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. • Be able to describe the Sun, Earth and Moon as approximately spherical bodies. • Be able to use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Y5/6 Science Plan B – Living things and their habitats **What is a lifecycle?**	
1. What is a lifecycle and how do they differ between groups?	
Intent	Children will be able to identify what a life cycle is and understand that it is a repeated cycle. Children will be able to describe the differences between the life cycles of a mammal, amphibian, insect and a bird.
Implementation	Children will watch a video clip about life cycles
2. How do animals reproduce?	
Intent	Children will describe the life cycle of some animals.
Implementation	Children will complete a research project on an animal or insect of their choice and present the information.
3. How do plants reproduce?	
Intent	Children will identify the parts of a plant and be able to name them.
Implementation	Children will dissect a flower (alstroemeria) to identify the female and male parts of the flower. They will be able to label a diagram and identify the function of each of the parts.
Impact	Children will: • Describe the differences in life cycles of a mammal, amphibian, insect and a bird. • Describe the life process of reproduction in some animals and plants.

Vocabulary Progression

Year 1/2 Working Scientifically Overview

New learning and vocabulary

properties, observe, test, magnifying glass, object, record, equipment

- **Know that we can ask questions about the world and that when we observe the world to answer these questions, this is science**
- **Know that we can use magnifying glasses to observe objects closely**
- **Know that we can test our questions to see if they are true**
- **Know that objects can be identified or sorted into groups based on their observable properties**
- **Know that we can write down numbers and words or draw pictures to record what we find**

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Year 3/4 Working Scientifically Overview

Revision

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New learning and vocabulary- ongoing from year 3

prediction, measurement, enquiry, dependent variable, independent variable, fair test, similar, theory, hypothesis

- 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
- Know 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
- Know how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches
- Know how to draw bar charts; how to label a diagram using lines to connect information to the diagram; how to use a coloured key how to draw a neat table; how to draw a classification key; how to show the relationship between an independent variable in a two-way table; and how to label specific results in a two-way table
- Know how - with structured guidance - 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
- Know how to precis a scientific enquiry write-up into a brief oral discussion of what was found in a scientific enquiry
- Know that scientific enquiries can suggest relationships, but that they do not prove whether a prediction is true
- Know that scientific enquiries are limited by the accuracy of the measurements (and measuring equipment) and by the extent to which conditions can vary even, and that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry
- Know that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts (e.g. effect of changing sunlight on a plant - does this work with other plants/ different types of light/ etc)
- Know that they can draw conclusions from the findings of other scientists
- Know 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

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New learning and vocabulary

line graph, relationship, outlier

- Know how to choose appropriate variables to test a hypothesis (e.g. plant height as a dependent variable when measuring effect of light on plant growth)
- Know how to identify conditions that were imperfectly controlled and can explain how these might affect results
- Know how to accurately use further measuring devices, including digital and analogue scales, measuring cylinders and beakers, recognizing the relative accuracy of each device
- Know 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
- Know how to independently write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion
- Know how to present brief oral findings from an enquiry, speaking clearly and with confidence and using notes where necessary
- Know examples of instances where scientific evidence has been used to support or refute ideas or arguments (e.g. fossil records as evidence of natural selection)