SCIENCE CURRICULUM

Our Science Curriculum includes broad scientific concepts that are embedded throughout the curriculum so that each one can be encountered multiple times. It also has a clear focus on disciplinary concepts so that pupils learn how to undertake scientific enquiry.

SCIENTIFIC CONCEPTS - GENERATIVE KNOWLEDGE				
PARTICLES	**ENERGY TRANSFER**	**FORCES**	**KINGDOMS**	**EARTH SCIENCE**
Materials and the particles they are made up of e.g. the arrangements of particles within solids, liquids and gases and how they behave. Effects of heating and cooling on particles. Separating mixtures and solutions.	Energy in different forms (light energy, sound energy, electrical energy and chemical energy from food) that can be measured and transferred from one place to another.	Identifying different forces, describing their direction and size and explaining their effects.	Identifying characteristics of living things. Making connections and understanding life processes. Learning about habitats, adaption and evolution.	Changes in weather and seasons. Movement of the Earth and other planets relative to the Sun. Concept of Day and Night. Movement of the moon relative to the Earth.

DISCIPLINARY KNOWLEDGE AND SCIENTIFIC ENQUIRY: How we 'work' and 'think' like a Scientist.				
EXPLANING SCIENCE	**CLASSIFICATION**	**DESIGNING EXPERIMENTS**	**DATA, TABLES & GRAPHS**	**MAKING CONCLUSIONS**
Using knowledge and understanding of science, and appropriate vocabulary, to describe and explain what, where, why and how.	Sorting things into groups based upon common properties, features or behaviours. Objects may need to be identified by keys.	Investigating through predicting, changing and measuring. Observing and measuring over short and long periods of time.	Recording and analysing data within tables and charts. Constructing tables and graphs.	Recognising and describing patterns, trends and relationships. Using data to draw conclusions and evaluate.

Science Curriculum Topics of Study and Substantive Concepts

NATIONAL CURRICULUM TOPICS OF STUDY	SCIENTIFIC CONCEPTS				
	PARTICLES	ENERGY TRANSFER	FORCES	KINGDOMS	EARTH SCIENCE
YEAR 1: Seasonal Changes		✓			✓
YEAR 1: Everyday Materials	✓				
YEAR 1: Animals including Humans				✓	
YEAR 1: Plants				✓	
YEAR 2: Uses of Everyday Materials	✓				
YEAR 2: Living Things and Habitats				✓	
YEAR 2: Plants				✓	
YEAR 2: Animals including Humans				✓	
YEAR 3: Light		✓			✓
YEAR 3: Rocks	✓				✓
YEAR 3: Animals including Humans				✓	
YEAR 3: Forces and Magnets	✓		✓		
YEAR 3: Plants				✓	
YEAR 4: States of Matter	✓				
YEAR 4: Sound	✓	✓			
YEAR 4: Animals including Humans		✓		✓	
YEAR 4: Living Things & Habitats				✓	
YEAR 4: Electricity		✓			
YEAR 5: Earth & Space		✓	✓	✓	✓
YEAR 5: Animals including Humans				✓	
YEAR 5: Living Things & Habitats				✓	
YEAR 5: Properties & Material Changes	✓				
YEAR 5: Forces	✓		✓		
YEAR 6: Animals including Humans				✓	
YEAR 6: Living Things & Habitats				✓	
YEAR 6: Evolution & Inheritance				✓	✓
YEAR 6: Light		✓			
YEAR 6: Electricity		✓			

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Years 1 & 2 **Cycle A**	**Plants** *Y1 National Curriculum Topic of Study*	**Animals including Humans** *Y1 National Curriculum Topic of Study*	**Animals including Humans** *Y2 National Curriculum Topic of Study*		**Living thigs and their habitats** Y2 National Curriculum Topic of Study	
Years 1 & 2 **Cycle B**	**Everyday Materials**	**Seasonal Change**	**Uses of Everyday Materials**	**Seasonal Change**	**Plants** *Y2 National Curriculum Topic of Study*	**Seasonal Change**
Years 3 & 4 **Cycle A**	**Forces & Magnets** *Y3 National Curriculum Topic of Study*	**Animals including Humans** *Y3 National Curriculum Topic of Study*	**Animals including Humans** *Y4 National Curriculum Topic of Study*	**Electricity** *Y4 National Curriculum Topic of Study*	**Plants**	
Years 3 & 4 **Cycle B**	**States of Matter** *Y4 National Curriculum Topic of Study*	**Living Things and Habitats**	**Rocks** *Y3 National Curriculum Topic of Study*	**Light**	**Sound**	
Years 5 & 6 **Cycle A**	**Properties and Changes of Materials** *Y5 National Curriculum Topic of Study*	**Electricity** *Y6 National Curriculum Topic of Study*	**Animals including Humans** *Y6 National Curriculum Topic of Study*		**Light**	**Evolution & Inheritance**
Years 5 & 6 **Cycle B**	**Earth & Space**	**Animals including Humans** *Y5 National Curriculum Topic of Study*		**Living Things and Habitats**	**Forces**	**Living Things and Habitats** *Y6 National Curriculum Topic of Study*

EYFS Foundations For Science

KNOW IT: Understanding the World: The Natural World

EYFS

Seasons and Weather

By the end of EYFS children should:

- ⇒ Understand changes in the natural world such as day and night and different seasons.
- ⇒ Know that there are four seasons within a year.
- ⇒ Describe changes that take place during these seasons within the natural world e.g. weather, plants and trees, animal hibernation.
- ⇒ Know and describe different weather conditions.
- ⇒ Know which types of weather are linked to different seasons.
- ⇒ Know the symbols used to represent common weather conditions.

Materials

By the end of EYFS children should:

- ⇒ Know the names of some common materials in their immediate environment.
- ⇒ Know and use the vocabulary used to describe basic properties of some common materials.
- ⇒ Know that some materials can change through heating and cooling.
- ⇒ Understand that some materials are better for making objects than others.

Animals, including Humans

By the end of EYFS children should:

- ⇒ Know the names of a variety of animals and their basic physical features.
- ⇒ Know that different types of animals eat different food.
- ⇒ Know and identify the names of their own body parts.
- ⇒ Know and use some of the vocabulary linked to senses.
- ⇒ Describe some lifecycles such as chick and/or frog.
- ⇒ Know how to provide basic care to domestic animals.

Plants

By the end of EYFS children should:

- ⇒ Know that plants are living things that grow in the earth.
- ⇒ Know that most plants have stems, leaves and roots and that some have flowers.
- ⇒ Know that plants grow from seeds.
- ⇒ Know that plants need water to grow and stay healthy.
- ⇒ Know how to provide basic care to plants.
- ⇒ Observe and describe plants within their local environment.

Forces and Magnets

By the end of EYFS children should:

- ⇒ Know that objects can be moved by pushing or pulling.
- ⇒ Know that some objects can move down a ramp without being pushed or pulled.
- ⇒ Know that if an object is pushed or pulled harder, it will move further.
- ⇒ Know that heavier objects need more push or pull to move.
- ⇒ Know that lighter objects need less push or pull to move.
- ⇒ Know what magnets are and explore and observe the behaviour of magnets on some materials in their immediate environment.

Light and Electricity

By the end of EYFS children should:

- ⇒ Know that light comes from the sun.
- ⇒ Know that light is needed to see things.
- ⇒ Know that darkness is the absence of light.
- ⇒ Know some other light sources such as torch, lamp etc.
- ⇒ Know that electricity makes things work.
- ⇒ Know that some objects need electricity to work.
- ⇒ Know that some objects use batteries to make them work.
- ⇒ Know some of the risks linked to electricity and the sun.

APPLY IT: PURPOSEFUL LEARNING OPPORTUNITIES

ALL FOUNDATIONS FOR SCIENCE SKILLS AND KNOWLEDGE SHOULD BE ENHANCED THROUGH THE PROVISION OF CAREFULLY PLANNED ACTIVITIES, ENABLING ENVIRONMENTS IN CONTINUOUS PROVISION AND INTERACTIONS WITH SKILLED PRACTITIONERS.

OPPORTUNITIES TO MAXIMISE FOUNDATIONS FOR SCIENCE IN THE EARLY YEARS SETTING

Daily Routines & Classroom Organisation

Daily calendar and weather.

Observing and caring for plants/animals in the classroom e.g. bulbs, chicks, caterpillars.

Observing and dressing up for weather, coats, boots, sun cream etc.

Model the use of everyday scientific equipment e.g. thermometer, torch, light box, magnifying glasses, magnets.

Introduce scientific vocabulary and knowledge in snack time and story e.g. pips in apples, pouring and filling liquid water and milk.

Areas in Continuous Provision

OUTDOOR

Observe and discuss plants and animals in the immediate environment including growth and change.

Note weather conditions and explore their effect e.g. melting snow, observing frost patterns, collect rain and explore shadows.

Explore the effect of forces in outdoor play with vehicles, balls and ramps.

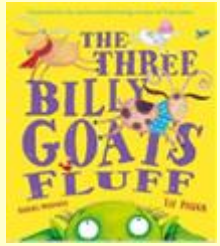
INDOOR

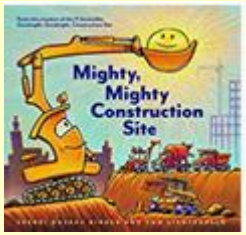
Set up specific investigation and observation areas linked to themes or topics e.g. melting chocolate to make cakes.

Have free access to maths and science equipment so that children and supporting adults can quickly pursue their own questions and ideas.

Access to different materials in construction, model making, woodwork and loose parts.

Quality Texts - Develop children's understanding of scientific language and concepts through the sharing of quality texts. Below are some examples of texts that ***could*** be used.





Year 1/2

Science Curriculum

DISCIPLINARY KNOWLEDGE AND SCIENTIFIC ENQUIRY:
How we 'work' and 'think' like a Scientist.

YEAR 1/2

EXPLAINING SCIENCE

YEAR 1

- Remember some simple facts about science.
- I use and remember relevant science words during activities.
- I describe what is happening using science words (with help).
- I add science word labels to diagrams (with help).
- I select science facts to use in an answer.

YEAR 2

- I remember relevant science facts with some confidence.
- I use and remember science words over time.
- I use science to describe/recall what I have seen.
- I add science labels and information (with help) to diagrams.
- I select relevant science facts to use in an answer.

CLASSIFICATION

YEAR 1

- I sort using simple yes /no statements.
- I group by difference or similarity.
- I link properties of materials to an application (with help).

YEAR 2

- I use simple spider keys with obvious differences.
- I group by difference, similarity or change.
- I link properties of materials to an application.

DESIGNING EXPERIMENTS

YEAR 1

- I suggest what might happen with help.
- I use a limited range of science equipment correctly (with help).
- I notice risk and can list some common dangers.
- I suggest and idea to investigate and ask questions.
- I begin to identify variables in an investigation.
- I follow short demonstrations, spoken and picture instructions.

YEAR 2

- I suggest what might happen in my investigation.
- I use a range of science equipment correctly (with help).
- I notice risk in my investigation and know common dangers.
- I suggest an idea to investigate from observations.
- I identify variables in investigations (label & describe).
- I follow short spoken and written instructions in order.

DATA, TABLES & GRAPHS

YEAR 1

- I position numbers on a number track.
- I measure in non-standard and compare e.g. heavier/ lighter.
- I use a simple table by recording words and numbers.
- I use a frame to add to pictograms and block charts.
- I add to block charts by counting up.

YEAR 2

- I measure labelled divisions on a number line, including in steps.
- I measure standard units, including length, mass and capacity.
- I use a simple table recording in words and numbers, including a tally.
- I construct simple pictograms and block charts.
- I use the scale on a block chart to add the correct blocks.

MAKING CONCLUSIONS

YEAR 1

- I recognise, create and describe simple number patterns.
- I use 'more or less' to compare numbers.
- I describe the changes that are happening.
- I explore different ways to do things through play.

YEAR 2

- I describe simple features and patterns in data and charts.
- I see obvious differences in sets of numbers.
- I describe changes that have happened.
- I suggest a different way to do things (with help).

Year 1/2

Cycle A

New Learning | Prior Learning

TEACH IT: Plants

YEAR 1/2 CYCLE A

KEY OBJECTIVES (STATUTORY)

- 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.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

R: Remember some simple science facts with help.
Y1: Remember some simple science facts.
Y2: Recall relevant science facts.

R: Use science words during and activity with help.
Y1: Use and remember relevant science words during activities.
Y2: Use and remember science words over time.

R: Use appropriate pictures and words to label items.
Y1: Add science labels to diagrams (with help).
Y2: Add science labels and information (with help) to diagrams.

CLASSIFICATION

R: Group by familiar features e.g. colour, size, shape etc.
Y1: Group by difference or similarity.
Y2: Group by difference, similarity or change.

R: Sort using images.
Y1: Sort by using simple yes/no statements.
Y2: Use a spider key with obvious differences.

VOCABULARY

plant, daisy, roots, dandelion, stem, thistle, trunk, daffodil, branches, rose, twigs, tulip, bark, crown, leaves, flower, petals, fruit, bulb, seed, evergreen, deciduous, vegetables, wild, naturally, garden.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

PLANTS: KINGDOMS

⇒ Plants are living things that grow in the earth.
⇒ Most plants have stems, leaves and roots and some have flowers.
⇒ Plants grow from seeds.
⇒ Plants need water to grow and stay healthy.
⇒ There are different types of plants: wild plants that grow naturally and garden plants which are chosen and helped to grow.
⇒ A tree is a plant. It is part of the plant kingdom because it has roots, stems, leaves and some have flowers. It also has a crown, which is formed by branches, twigs and leaves growing outwards from the trunk. The trunk is the stem of a tree, and branches grow from it. It has an outer covering called bark which offers protection.
⇒ There are different types of trees: deciduous trees drop their leaves in autumn and grow new ones during the spring; evergreen trees keep their leaves all year round.

Year 1/2 Cycle A Science	Unit of Learning: Plants			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What is a plant? What are the different parts of a plant?	**What are wild plants and where can they live?** What are the names of some of the most common wild plants?	**What are garden plants and where can they live?** What are the names of some of the most common garden plants?	**Is a tree a plant?** What are the different parts of a tree?	**What types of trees are there?** How are some trees different to each other? How do the seasons effect some trees?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Plants are living things that grow in the earth. • Most plants have stems, leaves and roots and some have flowers. • Plants grow from seeds. • Plants need water to grow and stay healthy.	• Plants are living things that grow in the earth. • There are different types of plants: wild plants that grow naturally and garden plants which are chosen and helped to grow.	• Plants are living things that grow in the earth. • There are different types of plants: wild plants that grow naturally and garden plants which are chosen and helped to grow.	• A tree is a plant. It is part of the plant kingdom because it has roots, stems, leaves and some have flowers. It also has a crown, which is formed by branches, twigs and leaves growing outwards from the trunk. • The trunk is the stem of a tree, and branches grow from it. It has an outer covering called bark which offers protection.	• There are different types of trees: deciduous trees drop their leaves in autumn and grow new ones during the spring; evergreen trees keep their leaves all year round.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Add science word labels.	Group by difference or similarity.	Group by difference or similarity.	Add science word labels.	Remember science words during an activity.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Living, non-living, plant, earth, stem, leaf, root. seed.	Living, earth, plant, type, wild, naturally.	Living, earth, plant, type, garden.	Kingdom, roots, stem, leaves, crown, branch, twig, outwards, trunk, covering, protection, bark.	Type, tree, leaves, seasons, deciduous, evergreen, all year round.

New Learning | Prior Learning

TEACH IT: Animals, including Humans

Year 1/2 Cycle A

Key Objectives (Statutory)

- Identify and name a variety of common animals that are birds, fish, amphibians 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 (birds, fish, amphibians, reptiles, mammals and invertebrates, including pets).
- Identify, name, draw and label the basic parts of the human body and say which parts of the body is associated with each sense.

Key Skills Objectives

Explaining Science

R: Remember some simple science facts with prompts.
Y1: Use and remember science words in an activity.
Y2: Use and remember science words over time.

R: Use the correct science word to describe.
Y1: Use science to describe what is happening.
Y2: Use science to describe and recall what has been seen.

R: Select the correct picture or label.
Y1: Add science words/labels to diagrams
Y2: Add science labels and information to diagrams (with support).

Classification

R: Group by familiar features e.g. colour, size, shape etc.
Y1: Group by difference or similarity.
Y2: Group by difference, similarity or change.

R: Sort using images.
Y1: Sort by using simple yes/no statements.
Y2: Use a spider key with obvious differences.

Vocabulary

animals, invertebrate, worm, spider, insect, woodlouse, fish, amphibian, reptile, bird, mammal, head, neck, arm, elbow, hand, leg, knee, mouth, taste, eye, sight, ear, hear, nose, smell, touch.

Key Conceptual Knowledge And Understanding

Animals, including humans: kingdoms

⇒ Know the names of a variety of animals and their basic physical features.
⇒ Know that different types of animals eat different foods.
⇒ Know and identify the names of their own body parts.
⇒ Know the vocabulary linked to the senses.
⇒ Animals need to move freely, eat other things and need water.
⇒ An animal is not a plant, does not make food from the sun and is not rooted to the ground.
⇒ Animals can be grouped into five different categories: mammals, birds, amphibians, reptiles and fish.
⇒ Mammals are warm-blooded, have skin, hair or fur, give birth to live young and breathe air; humans are mammals.
⇒ Birds are warm-blooded, have feathers, beaks and wings, lay eggs and breathe air.
⇒ Amphibians are cold-blooded, have slimy skin, lay soft eggs and most can breathe underwater and on land.
⇒ Reptiles are cold-blooded, have scaly skin, lay harder eggs and breathe air.
⇒ Fish are cold-blooded, have fins and scales, lay soft eggs in water and breathe underwater.
⇒ A carnivore only eats other animals and no plants.
⇒ An herbivore only eats plants and not animals.
⇒ An omnivore eats plants and animals.

Year 1/2 Cycle A Science	Unit of Learning: Animals, including Humans				
Teaching and Learning Sequence for this Unit.					
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What are the main parts of the body? What job does each of these parts have?	**What are our senses?** Which body parts are our senses linked to? What do our senses help us to do?	**Are there different kinds of animal?** What common animals do we know? What kind of animal are they?	**What makes a bird a bird? A fish a fish? A reptile a reptile?** Etc. What is special about their body parts? How can we use this to group them?	**Do animals have the same senses as humans?** How do they use them for survival?	**Do animals feed in different ways?** Which animals are carnivores / herbivores / omnivores?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• The human body has different parts that helps us to do different things like walk, talk, see and eat; Some examples: • Legs help us to move and balance. • Arms help us to move, push, pull and lift. • The head and neck help us to talk, hear, eat and see.	• The senses help us to learn about the world around us. • There are five senses: hearing, sight, smell, taste, touch. • Touch allows us to feel different things. • Sight allows us to see our surroundings. • We use our nose to smell things. • Hearing uses our ears to listen to sounds around us. • Taste comes from our mouth and tongue.	• The names of a variety of animals and their basic physical features. • Animals need to move freely, eat other things and need water. • An animal is not a plant, does not make food from the sun and is not rooted to the ground. • Animals can be grouped into five different categories: mammals, birds, amphibians, reptiles and fish.	• Mammals are warm-blooded, have skin, hair or fur, give birth to live young and breathe air; humans are mammals. • Birds are warm-blooded, have feathers, beaks and wings, lay eggs and breathe air. • Amphibians are cold-blooded, have slimy skin, lay soft eggs and most can breathe underwater and on land. • Reptiles are cold-blooded, have scaly skin, lay harder eggs and breathe air. • Fish are cold-blooded, have fins and scales, lay soft eggs in water and breathe underwater.	• Humans and animals have five senses: hearing, sight, smell, taste and touch. • Senses are really important for a range of animals to survive in the wild. • For example, owls have very strong hearing and moles have a heightened sense of smell, whereas foxes have heightened eyesight to help them to see in the dark.	• Different types of animals eat different foods. • A carnivore only eats other animals and no plants. • An herbivore only eats plants and not animals. • An omnivore eats plants and animals.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Add science word labels to diagrams.	Add science word labels to diagrams.	Group by difference or similarity.	Sort using yes/no statements.	Remember some simple facts about science.	Group by difference or similarity.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Parts, main, role, balance, move.	Sense, feel, sight, hearing, tongue.	Features, grouped, category.	Warm-blooded, cold-blooded, breathe.	Survival, wild, heightened.	Carnivore, herbivore, omnivore.

New Learning | Prior Learning

TEACH IT: Animals, including Humans

YEAR 1/2 CYCLE A

KEY OBJECTIVES (STATUTORY)

- Notice that animals, including humans, have offspring that 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 foods, and hygiene.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

R: Remember some simple science facts with prompts.
Y1: Use and remember science words in an activity.
Y2: Use and remember science words over time.

R: Use the correct science word to describe.
Y1: Use science to describe what is happening.
Y2: Use science to describe and recall what has been seen.

R: Select the correct picture or label.
Y1: Add science words/labels to diagrams
Y2: Add science labels and information to diagrams (with support).

DATA, TABLES AND GRAPHS

R: Add pictures to a table to collect results e.g. add an apple to Monday etc
Y1: Use a simple table of results (words and numbers).
Y2: Use a simple table of results (numbers) and tally numbers.

R: Use a part completed frame to add symbols to a pictogram or blocks to a chart.
Y1: Use a frame to add to pictograms and block charts.
Y2: Construct pictograms and block charts.

VOCABULARY

Baby, offspring, toddler, child, adolescent, teenager, adult, reproduction, growth, water, hydrated, food, nutrition, diet, balanced, air, oxygen, breathing, respiration, exercise, fitness, heart rate, pulse, hygiene, microbes (bacteria, viruses, fungi), number track, number line, division, table of results, cause, effect, pictogram, block, block chart, bar, bar chart, axes, coordinate

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ Animals need to move freely, eat other things and need water.
⇒ An animal is not a plant, does not make food from the sun and is not rooted to the ground.
⇒ Animals can be grouped into five different categories: mammals, birds, amphibians, reptiles and fish.
⇒ Mammals are warm-blooded, have skin, hair or fur, give birth to live young and breathe air; humans are mammals.
⇒ Birds are warm-blooded, have skin, feathers, beaks and wings, lay eggs and breathe air.
⇒ Amphibians are cold-blooded, have slimy skin, lay soft eggs and most can breathe underwater and on land.
⇒ Reptiles are cold-blooded, have scaly skin, lay harder eggs and breathe air.
⇒ Fish are cold-blooded, have fins and scales, lay soft eggs in water and breathe underwater.
⇒ A carnivore only eats other animals and no plants; a herbivore only eats plants and not animals; an omnivore eats plants and animals.
⇒ Animals with backbones are called vertebrates; mammals, reptiles, amphibians, birds and fish are all vertebrates.
⇒ Animals without backbones are called invertebrates; insects, worms, jellyfish, snails and sea sponges are all invertebrates.
⇒ Animals have the following features: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition (MRS GREN).
⇒ Animals, including humans have offspring that grow into adults.
⇒ Animals grow and change; some animals look like their parents and others do not.
⇒ Humans also grow and change; there are six stages of human maturation: baby, toddler, child, teenager, adult and older adult.
⇒ All animals need water, food and air to survive.
⇒ Animals, including humans cannot make their own food.

Year 1/2 Cycle A Science	Unit of Learning: Animals, including Humans					
Teaching and Learning Sequence for this Unit.						
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What is an animal? What can we remember about the different groups of animals and their characteristics? What do all animals do?	**What happens to our bodies as we grow?** What grows as we get older?	**Do other animals grow in the same way as us?** What are the similarities and differences?	**What do all animals need to stay alive?** Why is water, air and food essential for survival?	**Why do we eat different types of food?** How many days this week have we eaten our 5 A-Day?	**Why do humans need to exercise?** What happens to our body when we exercise? What types of exercise have we done this week?	**What is hygiene and why is it important?** Why is it important to brush our teeth and wash our bodies?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Animals need to move freely, eat other things and need water. • Animals can be grouped into five different categories: mammals, birds, amphibians, reptiles and fish. • Animals have the following features: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition (MRS GREN).	• Humans are mammals. • Animals, including humans have offspring that grow into adults. • Humans grow and change; there are six stages of human maturation: baby, toddler, child, teenager, adult and older adult.	• Animals, including humans have offspring that grow into adults. • Animals grow and change; some animals look like their parents and others do not. • Animals with backbones are called vertebrates; mammals, reptiles, amphibians, birds and fish are all vertebrates. • Animals without backbones are called invertebrates.	• Animals need to move freely, eat other things and need water. • An animal is not a plant, does not make food from the sun and is not rooted to the ground. • All animals need water, food and air to survive. • Animals, including humans cannot make their own food.	• We eat different types of food because they give our bodies different things they need to stay healthy and strong.	• Exercise is important for staying healthy and keeping our bodies strong. • When you exercise, your body needs more energy, which means your heart beats faster and your lungs work harder to get more oxygen to your muscles	• Keeping clean helps prevent the spread of germs which makes it less likely for us to get sick. • Keeping our teeth clean stops bacteria from building up which can cause teeth to rot. • It is important for well-being that we stay clean and healthy.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Remember relevant science facts.	Use a simple table by recording in numbers.	Remember words and facts about science.	Remembering words/facts about science.	Construct block charts.	Use a simple tally table.	Remember words and facts about science.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Category, mammal, amphibian, reptile, respiration, excretion, sensitivity.	Mammal, stage, mature, adult, toddler, human, lifecycle, offspring.	Offspring, human, animal, growth, life cycle, stages, parent.	Freely, rooted, survive, air, needs, oxygen, hydrated, nutrition.	Collect, data, results, table, present, show, fruit, vegetables, often.	Tally, record, types, exercise, show, often, collect results, compare.	Prevent, germs, bacteria, cause, rot, well-being, smell, clean.

New Learning | Prior Learning

TEACH IT: Living Things and Habitats

Year 1/2 Cycle A

Key Objectives (Statutory)

- Explore and compare 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 a 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.

Key Skills Objectives

Explaining Science

R: Remember some simple science facts with prompts.
Y1: Use and remember science words in an activity.
Y2: Use and remember science words over time.

R: Select the correct picture or label.
Y1: Add science words/labels to diagrams
Y2: Add science labels and information to diagrams (with support).

Classification

R: Group by familiar features e.g. colour, size, shape etc.
Y1: Group by difference or similarity.
Y2: Group by difference, similarity or change.

R: Sort using images.
Y1: Sort by using simple yes/no statements.
Y2: Use a spider key with obvious differences.

Vocabulary

Living, dead, non-living, movement, respiration, breathing, energy, sensitivity, sight, touch, hearing, smell, taste, growth, reproduction, offspring, excretion, waste, nutrition, habitat, microhabitat, conditions, adapted, adaptation, light, temperature, water, humidity, food chain, feeding, sort, group, classify, criteria, spider key.

Key Conceptual Knowledge and Understanding

⇒ A living thing has the following features: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition (MRS GREN).
⇒ Something that was once alive used to be able to do these things; something that has never been alive can't do these things.
⇒ Plants need sunlight, air and water to stay alive; animals need food, air, water and shelter to stay alive.
⇒ Most organisms (a single living thing) live in habitats; they are a natural place for animals and plants to live, grow and feed.
⇒ Different animals and plants are more suited to a particular habitat than others.
⇒ Different include: polar, ocean, woodland, rainforest, urban, desert, coastal and pond. Micro-habitats are smaller scale e.g. rock pools.
⇒ Woodland habitats are green and shady and are part of our local environment.
⇒ All animals and plants need food to live and they are all part of a food chain.
⇒ A carnivore only eats other animals and no plants; a herbivore only eats plants and not animals; an omnivore eats plants and animals.
⇒ All living things need energy. They get this energy from food. A food chain shows how energy is passed between plants and animals. Humans are part of a food chain too.
⇒ If one part of a food chain is taken away, it will affect all the other creatures in the chain
⇒ Plants make food using energy from the sun. They are called **producers**.
⇒ Animals are called **consumers** because they eat plants and other animals; animals that eat other animals are called **predators.**
⇒ Animals that are eaten are called **prey.**

Year 1/2 Cycle A Science	Unit of Learning: Living Things and Habitats				
Teaching and Learning Sequence for this Unit.					
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What is alive and what is not? Can we identify living, dead and non-living things?	**What do all living things have in common?** Can we identify the 7 features of living things? (MRS GREN).	**What is a habitat?** Where do different plants and animals live? Why are they suited to this environment?	**What plants and animals live in our school environment?** Where can we find these plants and animals? How do we know that they are living? Why is a log a microhabitat?	**What are food chains?** How are they connected? Are humans part of a food chain?	**Why do plants and animals need each other?** What can happen if part of a food chain is taken away?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• A living thing has the following features: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition (MRS GREN). • Something that was once alive used to be able to do these things; something that has never been alive can't do these things.	• A living thing has the following features: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition (MRS GREN). • Plants need sunlight, air and water to stay alive; animals need food, air, water and shelter to stay alive.	• Most organisms (a single living thing) live in habitats; they are a natural place for animals and plants to live, grow and feed. • Different animals and plants are more suited to a particular habitat than others. • Different include: polar, ocean, woodland, rainforest, urban, desert, coastal and pond. Micro-habitats are smaller scale e.g. rock pools.	• Different animals and plants are more suited to a particular habitat than others. • Woodland habitats are green and shady and are part of our local environment.	• All animals and plants need food to live and they are all part of a food chain. • A carnivore only eats other animals and no plants; a herbivore only eats plants and not animals; an omnivore eats plants and animals.	• If one part of a food chain is taken away, it will affect all the other creatures in the chain. • Plants make food using energy from the sun. They are called producers. • Animals are called consumers because they eat plants and other animals; animals that eat other animals are called predators. • Animals that are eaten are called prey.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Group using differences, similarities and changes.	Use and remember science words over time.	Use and remember science words over time.	Group using differences, similarities & changes.	Add labels and information to diagrams.	Remember simple science facts with confidence.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Features, alive, dead, non-living, movement, respiration, sensitivity, growth etc.	Shelter, air, sunlight, movement, respiration, sensitivity, growth etc.	Habitat, organism, single, natural, particular, suited, micro, smaller.	Habitat, environment single, natural, particular, suited, micro, smaller, shady.	Chain, carnivore, herbivore, omnivore, part, connected, label, diagram, producer, consumer, prey.	Predator, prey, consumer, producer, energy, food chain, remove, connected.

Year 1/2

Cycle B

New Learning | Prior Learning

TEACH IT: Everyday Materials

YEAR 1/2 CYCLE B

KEY OBJECTIVES (STATUTORY)

- 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 based on their simple physical properties.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

R: Remember some simple science facts with prompts.
Y1: Use and remember science words in an activity.
Y2: Use and remember science words over time.

R: Use the correct science word to describe.
Y1: Use science to describe what is happening.
Y2: Use science to describe and recall what has been seen.

R: Select the correct picture or label.
Y1: Add science words/labels to diagrams
Y2: Add science labels and information to diagrams (with support).

CLASSIFICATION

R: Group by familiar features e.g. colour, size, shape etc.
Y1: Group by difference or similarity.
Y2: Group by difference, similarity or change.

R: Sort using images.
Y1: Sort by using simple yes/no statements.
Y2: Use a spider key with obvious differences.

R: Use senses to identify properties of materials.
Y1: Begin to make some links between properties of materials to an application.
Y2: Link properties of materials to an application.

VOCABULARY

Materials, Wood, Plastic, Glass, Metal, Water, Rock, Brick, Paper, Fabrics, Elastic, Foil, Properties, Hard/ soft, Stretchy/ stiff, Shiny/ dull, Rough/ smooth, Bendy/ not bendy, Waterproof/ not waterproof, Absorbent/ not absorbent

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

. EVERYDAY MATERIALS: PARTICLES

⇒ Know the names of some common materials in the immediate environment.
⇒ Know vocabulary used to describe basic properties of common materials.
⇒ Know that some materials can change through heating and cooling.
⇒ Objects are made from different materials.
⇒ All objects are solid.
⇒ The materials that they are made from have different properties.
⇒ These properties affect their appearance and determine how they might be used.

Year 1/2 Cycle B Science	Unit of Learning: Everyday Materials			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What is a material? What materials are everyday objects made from? What are the most common?	**How can we sort everyday objects according to the material they are made from?** Can we sort a set of objects into different groups?	**What are the properties of common materials?** How can we describe different materials? What vocabulary do we use to describe them?	**How do we sort materials based on their properties?** How can we sort materials according to their properties?	**Which materials would be best and why?** How can we decide which materials are best for creating an object?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know the names of some common materials in the immediate environment. • Objects are made from different materials. • All objects are solid.	• Know the names of some common materials in the immediate environment. • Objects are made from different materials. • All objects are solid.	• Know vocabulary used to describe basic properties of common materials. • Materials that objects are made from have different properties. • These properties affect their appearance and determine how they might be used.	• Know vocabulary used to describe basic properties of common materials. • Materials that objects are made from have different properties. • These properties affect their appearance and determine how they might be used.	• Materials that objects are made from have different properties. • These properties affect their appearance and determine how they might be used.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Remember some science facts and words.	Sort using yes/no statements.	Add science word labels to diagrams.	Sort using yes/no statements.	Link properties of materials to an application and words.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Materials, wood, plastic, glass, metal, water, rock, brick, paper, fabrics, elastic, foil, solid.	Materials, wood, plastic, glass, metal, water, rock, brick, paper, fabrics, elastic, foil, solid, sort, groups.	Properties, hard/ soft, stretchy/ stiff, shiny/ dull, rough/ smooth, bendy/ not bendy, waterproof/ not waterproof, absorbent/ not absorbent.	Properties, hard/ soft, stretchy/ stiff, shiny/ dull, rough/ smooth, bendy/ not bendy, waterproof/ not waterproof, absorbent/ not absorbent.	Properties, hard/ soft, stretchy/ stiff, shiny/ dull, rough/ smooth, bendy/ not bendy, waterproof/ not waterproof, absorbent/ not absorbent.

New Learning | Prior Learning

TEACH IT: Seasonal Changes: Ongoing Topic

YEAR 1/2 CYCLE B

KEY OBJECTIVES (STATUTORY)	KEY SKILLS OBJECTIVES		VOCABULARY
• Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.	**EXPLAINING SCIENCE** **R:** Remember some simple science facts with prompts. **Y1**: Use and remember science words in an activity. **Y2**: Use and remember science words over time. **R:** Use the correct science word to describe. **Y1**: Use science to describe what is happening. **Y2**: Use science to describe and recall what has been seen. **R:** Use appropriate pictures and words to label items. **Y1:** Describe what is happening using science. **Y2:** Use knowledge of science to describe/recall observations.	**DATA, TABLES AND GRAPHS** **R:** Use a simple table by recording in pictures and words. **Y1:** Use a simple table by recording in words and numbers. **Y2:** Use a simple table recording in words and numbers, including a tally. **R:** Use prepared pictograms to record observations. **Y1:** Use a frame to add to pictograms. **Y2:** Construct simple pictograms and block charts. **R:** Add to pictograms by counting up. **Y1**: Add to block charts and pictograms by counting up. **Y2:** Use the scale on a block chart to add the correct blocks.	Season, Sun, Sky, Autumn, Winter, Spring, Summer, Year, Month, Week, Day, Weather, Temperature, Rainfall, Day length, Shadow

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ There are four seasons within a year.
⇒ Changes take place within these seasons e.g. weather, plants including trees and animal hibernation.
⇒ There are different weather conditions, and these can be represented through symbols.
⇒ Different types of weather are linked to different seasons.
⇒ The sun provides heat and light-energy.
⇒ Although the sun appears to move across the sky, it does not.
⇒ The sun rises earlier and sets later in the summer than in the winter.
⇒ This means long days of sunlight during the summer and shorter, darker days during the winter.
⇒ The weather changes within each of the seasons; humans, animals and plants adapt to these changes.

Year 1/2 Cycle B Science	Unit of Learning: Seasonal Changes			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What do we know about weather? What types of weather are there and what symbols can be used to represent these?	**How does the weather change across the seasons?** What kinds of weather do we link with each of the seasons?	**How does day length vary between the seasons?** What is sunrise and sunset? Why does the length of day change?	**How do humans, plants and animals adapt to seasonal changes?**	**Can we set up a weather station to monitor and record different weather over time?**
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• The weather is how we would describe the sky and the air outside now. • There are different weather conditions, and these can be represented through symbols. • We can have different types of the same weather: light rain/heavy rain. • We can have different types of weather at the same time.	• There are four seasons within a year. • Changes take place within these seasons e.g. weather, plants including trees and animal hibernation. • The weather changes within each of the seasons.	• The sun provides heat and light-energy. • Although the sun appears to move across the sky, it does not. • The sun rises earlier and sets later in the summer than in the winter. • This means long days of sunlight during the summer and shorter, darker days during the winter.	• The weather changes within each of the seasons; humans, animals and plants adapt to these changes.	• Weather can change very quickly from minute to minute, day to day and season to season. • Different equipment can be used to measure and map the weather. • A thermometer is an instrument used to measure temperature. • A weathervane uses compass directions to show where the wind is coming from.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Use and remember scientific words during an activity.	Use and remember scientific words during an activity.	Use and remember scientific words during an activity.	Use and remember scientific words during an activity.	Add to block charts or pictograms by counting up.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Symbol, drizzle, light, heavy, dull overcast, gusty, breezy, cloudy, symbols, forecast.	Seasons, sunlight, colder, warmer, darker, lighter, weather patterns.	Sunrise, sunset, daylight, summer, winter, darker, lighter, shorter, longer.	Adapt, hibernation, food, shelter, nesting, seasons, changes, migrate.	Monitor, temperature, record, direction, rainfall, equipment, instrument.

New Learning | Prior Learning

TEACH IT: Uses of Everyday Materials

YEAR 1/2 CYCLE B

KEY OBJECTIVES (STATUTORY)

- 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.

KEY SKILLS OBJECTIVES

CLASSIFICATION

R: Group by familiar features e.g. colour, size, shape etc.
Y1: Group by difference or similarity.
Y2: Group by difference, similarity or change.

R: Use senses to identify properties of materials.
Y1: Begin to make some links between properties of materials to an application.
Y2: Link properties of materials to an application.

DESIGNING EXPERIMENTS

R: Select equipment from a few different options and work with an adult to use it.
Y1: Use some equipment correctly with help.
Y2: Use a range of equipment correctly.

R: Select possible risks from a set of given images.
Y1: Notice risk and list some common dangers.
Y2: Notice risk and know common dangers.

R: Follow a series of steps based on verbal instructions.
Y1: Follow short demonstrations and/or spoken and picture instructions.
Y2: Follow short spoken and written instructions.

VOCABULARY

Object, material, wood, metal, plastic, wool, cotton, paper, cork, rock, glass, fabric, ceramic, rope, concrete, rubber, sponge, ice, water, water vapour, property, rigid, flexible, hard, soft, waterproof, absorbent, warm, cold, rough, smooth, dull, shiny, opaque, transparent, application, solid, liquid, gas, squash, bend, twist, stretch, force, sort, group, classify, criteria, equipment, variable, variable label, cause, effect, investigation, range, method.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ Objects are made from different materials.
⇒ All objects are solid.
⇒ The materials that they are made from have different properties.
⇒ These properties affect their appearance and determine how they might be used.
⇒ Everything in the universe is made up of particles.
⇒ A particle is a tiny piece of matter (anything that has weight and takes up space) which cannot be seen through the naked eye.
⇒ There are three states of matter: Solids, Liquids and Gases.
⇒ The particles in a solid are very close together, therefore they cannot usually be compressed or squashed.
⇒ The particles in a solid are arranged in a regular way, which gives them a fixed shape.

Year 1/2 Cycle B Science	Unit of Learning: Uses of Everyday Materials				
Teaching and Learning Sequence for this Unit.					
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What are things made from? What can we remember about the most common materials?	**Do different materials have different properties?** Can we test materials to learn more about their properties?	**What materials are these objects made from and why?** What else could they or couldn't they be made from? Why?	**Can we change the shape of solid objects by squashing, bending, twisting and stretching?**	**Why can some solid objects be manipulated more than others?** Which properties prevent you from changing an object?	**What are solids, liquids and gases?** What are particles? How can we describe the particles in each? Can we sort a range of materials into solid or liquid?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Objects are made from different materials. • All objects are solid. • Wood, metal, plastic and glass are all common materials. • Everything in the universe is made up of particles. • A particle is a tiny piece of matter (anything that has weight and takes up space) which cannot be seen through the naked eye.	• Different materials have different properties. • Materials can be transparent which means they allow light to pass through them. • They can be waterproof which means they do not let water through. • We can test a material to learn more about its properties for example, is it transparent, waterproof or flexible.	• Objects are made from different materials depending on their use. • Materials must have the right properties to be made into particular objects. • This means that they are suited to or well-matched or that they are not well suited to.	• Some materials don't just have a fixed shape; they can be changed by force. • Some materials will return to the shape they were after being changed by force and some will not.	• The particles in a solid are very close together, therefore they cannot usually be compressed or squashed. • The particles in a solid are arranged in a regular way, which gives them a fixed shape.	• Everything in the universe is made up of particles. • A particle is a tiny piece of matter (anything that has weight and takes up space) which cannot be seen through the naked eye. • There are three states of matter: Solids, Liquids and Gases.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Link properties to application.	Use a range of equipment correctly.	Link properties to application.	Group by difference, similarity or change.	Link properties to application.	Follow instructions.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Object, material, properties, particles, common.	Transparent, opaque, translucent, waterproof, absorbent, flexible, rigid, properties.	Suitable, material, object, properties, matched, not suitable.	Solid, fixed, force, squash, stretch, twist, bend, return.	Particles, solid, close, compress, squash, fixed.	Particles, solid, liquid, gas, materials.

New Learning | Prior Learning

TEACH IT: Plants

YEAR 1/2 CYCLE B

KEY OBJECTIVES (STATUTORY)

- 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.

KEY SKILLS OBJECTIVES

DESIGNING EXPERIMENTS

R: Select from a few given options what might happen next.
Y1: Suggest what might happen (with help)
Y2: Suggest what might happen in my investigation.
Y2: Suggest an idea to test from observations.

R: Follow a series of steps based on verbal instructions.
Y1: Follow short demonstrations and/or spoken and picture instructions.
Y2: Follow short spoken and written instructions.

MAKING CONCLUSIONS

R: Select from a few given options what might happen next.
Y1: Recognise and describe number patterns.
Y2: Describe simple patterns in data and charts.

R: Notice when a change is happening.
Y1: Describe changes that are happening.
Y2: Describe changes that have happened.

Y1: Explore different ways to do things through play.
Y2: Suggest a different way to do things.

VOCABULARY

Leaf, stem, root, flower, bud, shoot, tap root, lateral root, seed, bulb, germinate, grow, cotyledon, seedling, adult, water, light, temperature, survive, reproduction, experiment, variable, observe, measure, cause, effect, comparative test, fair test, method, data range, predict, pattern

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ Plants are living things that grow in the earth.
⇒ Most plants have stems, leaves and roots and some have flowers.
⇒ There are different types of plants: wild plants that grow naturally and garden plants which are chosen and helped to grow.
⇒ A tree is a plant. It is part of the plant kingdom because it has roots, stems, leaves and some have flowers. It also has a crown, which is formed by branches, twigs and leaves growing outwards from the trunk. The trunk is the stem of a tree, and branches grow from it. It has an outer covering called bark which offers protection.
⇒ There are different types of trees: deciduous trees drop their leaves in autumn and grow new ones during the spring; evergreen trees keep their leaves all year round.
⇒ Plants grow from seeds or bulbs
⇒ A seed is a store of energy.
⇒ Germination is the process of a seed developing into a plant.
⇒ A seed needs water and warmth to germinate; it does not need light.
⇒ Some plants grow first a seed and then develop a bulb that helps them to grow back year after year.
⇒ Plants need water, light and a suitable temperature to grow and stay healthy.

Year 1/2 Cycle B Science	Unit of Learning: Plants			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What is a plant? What are the different parts of a plant?	**How do plants grow?** How do seeds germinate? How do bulbs sprout?	**What do plants need to grow and stay healthy?** Can a seed germinate in the dark? Can a plant grow in the dark?	**Can we use our knowledge to grow a healthy plant?** What conditions will we need for this to happen? What have we learnt about the lifecycle of a plant?	**What happens when plants do not get all of the things they need?** What do we need to do to look after plants?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Plants are living things that grow in the earth. • Most plants have stems, leaves and roots and some have flowers. • There are different types of plants: wild plants that grow naturally and garden plants which are chosen and helped to grow. • A tree is a plant. It is part of the plant kingdom because it has roots, stems, leaves and some have flowers.	• Plants grow from seeds or bulbs • A seed is a store of energy. • Germination is the process of a seed developing into a plant. • Some plants grow first a seed and then develop a bulb that helps them to grow back year after year.	• A seed needs water and warmth to germinate; it does not need light. • Plants need water, light and a suitable temperature to grow and stay healthy.	• A seed needs water and warmth to germinate; it does not need light. • Plants need water, light and a suitable temperature to grow and stay healthy. • When carrying out an investigation scientists plan for a fair test. • This means that only one variable will be changed.	• Plants need water, light and a suitable temperature to grow and stay healthy.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Use a remember science words over time.	Follow short spoken and written instructions.	Suggest an idea to test from observations.	Follow instructions time.	Describe patterns in data and charts.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Living things, plants, leaves, roots, stem, tree, kingdom, flower.	Plant, seed, bulb, germination, process, develop, grow.	Seed, germinate, water, light, temperature, suitable, healthy, warmth.	Investigation, grow, healthy, conditions, scientists, fair test, variable, change, keep the same.	Nurture, thrive, healthy, conditions, temperature, data, results, patterns.

New Learning | Prior Learning

APPLY IT: Working Scientifically

YEAR 1/2

CHILDREN SHOULD BE SUPPORTED TO DEVELOP THEIR UNDERSTANDING OF SCIENTIFIC IDEAS BY USING DIFFERENT TYPES OF SCIENTIFIC ENQUIRY THROUGHOUT ALL TEACHING.

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 programmes 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.

POSSIBLE SCIENTIFIC INVESTIGATIONS:

CYCLE A

Plants:

- What different types of trees can we find in our school grounds?
- What plants including trees can we find in two different areas? Which are garden plants and which are wild?

Animals, including Humans:

- Label human body parts as well as animal-what is the same? What is different?
- Play games to investigate senses - link each sense to a body part. Who has the fastest reactions?

Animals, including humans:

- How does height/hand/foot spans compare across school?
- What grows as we get older?
- Do animals grow in the same way as we do?
- What foods do I eat the most?
- How many days this week have I had my 5-A-Day?
- What happens to our body when we exercise?

Living things and their habitats:

- What can we find in our school environment that is living, dead, non-living?
- What animals and their habitats can we find within our school grounds?
- What are the features of these habitats?

CYCLE B

Uses of Everyday Materials:

- Which objects can we change the shape of?
- Which properties prevent you from changing an object?
- What is the effect of heat on bending/stretching etc.?

Seasonal Changes:

- Keep a daily record of the weather.
- Compare the weather in other countries.
- Which trees lose their leaves first in the autumn?
- Which trees are the first to grow new leaves in the spring?
- How many hours of daylight are there? Create block charts for the first day of each month.

Everyday Materials:

- How do different materials feel?
- How many properties can you link to any one object?
- Which materials would be best and why?
- Did the materials work well? What would you change? Why?

Plants:

- What conditions do plants grow best in?
- What is the effect of water/ temperature on germination/growth of cress?

Year 3/4

Science Curriculum

DISCIPLINARY KNOWLEDGE AND SCIENTIFIC ENQUIRY:
How we 'work' and 'think' like a Scientist.

YEAR 3/4

EXPLAINING SCIENCE

YEAR 3

- Use science ideas to describe and explain.
- Remember science words that I have used before (longer term)
- Begin to use science models to describe (sequence).
- Add science labels and information to diagrams.
- Link relevant facts together in an answer.

YEAR 4

- Show a developing knowledge and understanding of science ideas and concepts.
- Use simple science words correctly (meaning; apply).
- Use science models to describe what and where.
- Annotate diagrams to help describe and explain.
- Cluster related facts together into points (recalled).

CLASSIFICATION

YEAR 3

- Use classification keys with obvious differences.
- Create groups by sorting and can create my own criteria.
- Combine properties required for an application (with help).

YEAR 4

- Use a range of spider keys with fine differences.
- Create appropriate groups for sorting (create criteria).
- Describe combined properties required for an application.

DESIGNING EXPERIMENTS

YEAR 3

- Predict cause and effect.
- Select suitable equipment for the task.
- Predict obvious risk and act on safety suggestions.
- Identify cause and effect in my investigation.
- Suggest a suitable data range for a variable.
- Follow written instructions and write a simple method.

YEAR 4

- Predict a trend (relationship prediction).
- Select and use suitable equipment for the task.
- Predict obvious risk and work safely (mostly).
- Plan a fair test by selecting variables to change and measure.
- Suggest a data range and interval for a variable.
- Design and write a simple ordered method (from plan).

DATA, TABLES & GRAPHS

YEAR 3

- Measure unlabelled divisions on a number line (+ve values).
- Measure/compare values in standard units.
- Use a frame to construct a simple table of results.
- Use a frame to construct a bar chart (with help)
- Draw bars on a bar chart (one axis co-ordinate).

YEAR 4

- Measure unmarked divisions on a number line (positive values).
- Measure/convert values in standard units (inc time).
- Construct a simple table to compare cause and effect.
- Construct bar charts correctly (inc numerical axis).
- Plot coordinates on a graph in the first quadrant.

MAKING CONCLUSIONS

YEAR 3

- Describe simple patters in data, charts and graphs.
- See subtle differences in sets of numbers.
- Describe my results by linking cause and effect.
- Suggest improvements to my method. I describe simple patters in data, charts and graphs.
- See subtle differences in sets of numbers.
- Describe my results by linking cause and effect.
- Suggest improvements to my method.

YEAR 4

- Describe simple patterns, trends and relationships in data.
- See differences (errors) in repeated data.
- Describe trends and begin to use science to explain.
- Suggest sensible improvements to my method. I describe simple patterns, trends and relationships in data.
- See differences (errors) in repeated data.
- Describe trends and begin to use science to explain.
- Suggest sensible improvements to my method.

YEAR 3/4

CYCLE A

New Learning	Prior Learning

TEACH IT: Forces & Magnets

YEAR 3/4 CYCLE A

KEY OBJECTIVES (STATUTORY)

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

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y2: Use key science words.
Y3: Remember science words used before.
Y4: Use and apply simple science words correctly.

Y2: Use key science words.
Y3: Begin to use knowledge of forces to describe.
Y4: Use knowledge of forces and magnets, to describe what and how

Y2: Add labels and information to diagrams with support.
Y3: Add labels and information to diagrams independently.
Y4: Annotate diagrams to help describe and explain.

DESIGNING EXPERIMENTS

Y2: Suggest what might happen in an investigation.
Y3: Predict cause and effect.
Y4: Predict a trend (relationship prediction).

Y2: Use a range of science equipment correctly.
Y3: Select suitable equipment.
Y4: Select and use suitable equipment for the task.

Y2: Follow short, spoken and written, instructions.
Y3: Follow written instructions.
Y4: Design and write a simple ordered method.

VOCABULARY

Force, force arrow, contact force, push force, pull force, twist force, friction force, non-contact force, gravity force, movement, magnet (types), attract, repel, poles (north and south), magnetic, non-magnetic, magnetism, variable, cause, effect, prediction, comparative test, fair test, pattern, method, relationship, trend, data range, data interval.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

FORCES

⇒ Forces are pushes or pulls in a particular direction.
⇒ A push or a pull force is needed to move an object.
⇒ Forces can be bigger or smaller and acts in a particular direction.
⇒ Objects move further with more force.
⇒ Heavier objects need more force to move than lighter objects.
⇒ There are different types of forces: a push force, a pull force, a gravitational force (an air resistance force, water resistance force and friction force-Y5).
⇒ Some forces need contact (contact forces) between two objects and some forces act at a distance (non-contact forces)
⇒ The type of force should be identified using a label; the size and direction of a force can be shown using an arrow. The length of the arrow determines the size of the force; if arrows are of equal length, then the forces will be equal in size. The direction of an arrow determines in which direction the force is acting.
⇒ When forces are balanced, they cancel each other out, resulting in no change in motion for the object they are acting on. Unbalanced forces do not cancel each other out and result in a change in motion for the object they are acting on.
⇒ Magnets attract and repel each other. Magnets have two poles, coinciding with Earth's poles- North and South.
⇒ Materials can be grouped together based upon whether they are attracted to a magnet (magnetic) or not.

Year 3/4 Cycle A Science	Unit of Learning: Forces & Magnets				
Teaching and Learning Sequence for this Unit.					
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What is a force? How can we change the shape of materials or make an object move by pushing or pulling? What is a balanced/ unbalanced force? How can we show this by using force arrows	**How can we show and measure contact forces?** What happens to the distance an object can be moved when we increase the push force? How can we measure the size of the force?	**What is gravity?** Is gravity always the same? How does the height at which we drop a ball affect how high it bounces? How would we use force arrows to model this?	**How do magnets behave?** Can we use our knowledge of forces to describe the effect of a magnet on an object and a magnet on a magnet?	**Are all magnets the same?** Which magnet is the strongest? What happens when we place different materials between a magnet and a paper clip?	**Which materials are magnetic?** Are all metals magnetic?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Forces are pushes or pulls in a particular direction. • Forces can be bigger or smaller and act in a particular direction. • The type of force should be identified using a label. • When forces are balanced, they cancel each other out, resulting in no change in motion for the object they are acting on. • Unbalanced forces do not cancel each other out and result in a change in motion for the object they are acting on.	• Some forces need contact (contact forces) between two objects and some forces act at a distance (non-contact forces). • The type of force should be identified using a label; the size and direction of a force can be shown using an arrow. The length of the arrow determines the size of the force; if arrows are of equal length, then the forces will be equal in size. The direction of an arrow determines in which direction the force is acting.	• Gravity is a force which pulls things towards the centre of Earth. It was discovered by Sir Isaac Newton.	• Magnets attract and repel each other. • This force, called magnetism, can act at a distance, meaning magnets don't always need to be in direct contact with an object to exert their influence. • Magnets have two poles, coinciding with Earth's poles- North and South.	• Magnets can be different sizes and shapes. • The strength of a magnet also varies. Some magnets are stronger than others meaning they can exert a greater force.	• Materials can be grouped together based upon whether they are attracted to a magnet (magnetic) or not. • While all magnets are made of magnetic materials, not all materials are magnetic. For example, iron, nickel, and cobalt are magnetic, while silver and gold are not.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Begin to use knowledge of forces to describe.	Predict cause and effect.	Predict cause and effect.	Begin to use knowledge of forces to describe.	Begin to use knowledge of forces to describe.	Predict cause and effect.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Motion, object, acting, balanced/unbalanced.	Contact/non-contact, distance, size, direction.	Gravity, force, movement, centre, pull.	Attract, repel, poles, exert, contact.	Varies, exert, greater, force, strength.	Materials, magnetic, non-magnetic, repel, attract.

New Learning | Prior Learning

TEACH IT: Animals, including Humans

YEAR 3/4 CYCLE A

KEY OBJECTIVES (STATUTORY)

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

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y2: Use key science words.
Y3: Remember science words used before.
Y4: Use and apply simple science words correctly.

Y2: Use key science words.
Y3: Begin to use knowledge of animals including humans to describe.
Y4: Use knowledge of animals including humans, to describe what and where.

Y2: Add labels and information to diagrams with support.
Y3: Add labels and information to diagrams independently.
Y4: Annotate diagrams to help describe and explain.

DATA, TABLES AND GRAPHS

Y2: Use a simple table, recording in words and numbers (including a tally).
Y3: Use a frame to construct simple tables.
Y4: Construct a simple table to compare cause and effect.

Y2: Use the scale on a block chart to add the correct blocks.
Y3: Draw bars on bar charts.
Y4: Construct a bar chart correctly (inc. numerical axis).

VOCABULARY

Nutrition, photosynthesis, energy, transfer, diet, carbohydrate (sugar), protein, fat, vitamins, minerals, fibre, balanced, unbalanced, obesity, starvation, skeleton, bones (various, humerus, ulna, radius), joint (hinge), vertebrate, invertebrate, muscles (triceps, biceps), tendon, antagonistic, pull force, push force, number line, division, table of results, cause, effect, pictogram, block, block chart, bar, bar chart, axes, coordinate.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

ANIMALS, INCLUDING HUMANS: KINGDOMS

⇒ Animals with backbones are called vertebrates; mammals, reptiles, amphibians, birds and fish are all vertebrates.
⇒ Animals without backbones are called invertebrates; insects, worms, jellyfish, snails and sea sponges are all invertebrates.
⇒ Animals do all these things: MRS GREN
⇒ Animals grow and change; some animals look like their parents and others do not.
⇒ Animals, including humans have offspring that grow into adults.
⇒ Humans also grow and change; there are six stages of human maturation: baby, toddler, child, teenager, adult and older adult.
⇒ All animals need water, food and air to survive.
⇒ Animals, including humans cannot generate their own food.
⇒ Food is a balance of nutrients that the body needs.
⇒ There are several essential nutrients that have different functions: water-vital for life; vitamins, minerals and fibre-keep us healthy; carbohydrates-give us energy; proteins-help us to grow; fats-give us energy, absorb vitamins and help nerves and brains. A small amount of fat is an essential part of a healthy diet.
⇒ The human body has different systems to survive.
⇒ The skeleton is a system, which acts as a frame to support and protect the body and allow movement.
⇒ Bones are alive and blood runs through them.
⇒ Muscles are a system. There are three main muscle types in the body: skeletal muscle, cardiac muscle and smooth muscle.
⇒ Muscles work in pairs to cause movement. Muscles move bones using forces.

Year 3/4 Cycle A Science	Unit of Learning: Animals, including Humans				
Teaching and Learning Sequence for this Unit.					
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What do animals, including humans need to eat to stay healthy? What effect does the food we eat have? How do humans use food to get the energy they need?	**What is a balanced diet?** How are different foods represented on a food pyramid? Which layers of the pyramid should we eat more of/less of?	**How balanced is our** diet? Which different food groups do I eat the most/least of?	**Where is my skeleton and what does it do?** What are the different bones within the skeletal system and what do they do?	**Do all animals have skeletons?** How and why do some animals have skeletons that are different to others?	**How do we move?** Where are our muscles? What do they do?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• All animals need water, food and air to survive. • Animals, including humans cannot generate their own food. • Food and drinks, except water, act as 'fuel' for the body because they provide energy. • When food is eaten it is broken down which releases the energy inside it and powers the human.	• Food is a balance of nutrients that the body needs. • There are several essential nutrients that have different functions: water-vital for life; vitamins, minerals and fibre-keep us healthy; carbohydrates-give us energy; proteins-help us to grow; fats-give us energy, absorb vitamins and help nerves and brains. A small amount of fat is an essential part of a healthy diet.	• There are several essential nutrients that have different functions: water-vital for life; vitamins, minerals and fibre-keep us healthy; carbohydrates-give us energy; proteins-help us to grow; fats-give us energy, absorb vitamins and help nerves and brains. A small amount of fat is an essential part of a healthy diet.	• The skeleton is a system, which acts as a frame to support and protect the body and allow movement. • Bones are alive and blood runs through them.	• Animals with backbones are called vertebrates. • Animals without backbones are called invertebrates. • Vertebrates are animals that have backbones and an endoskeleton (skeleton inside their bodies). • Invertebrates are animals that do not have backbones. Invertebrates can have a skeleton outside their bodies called an exoskeleton, while some invertebrates have no skeleton at all!	• Muscles are a system. There are three main muscle types in the body: skeletal muscle, cardiac muscle and smooth muscle. • Muscles work in pairs to cause movement. Muscles move bones using forces.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Begin to use knowledge of nutrition to explain.	Begin to use knowledge of nutrition to explain.	Use frames to construct tables and bar charts.	Add labels and information to diagrams.	Add labels and information to diagrams.	Add labels and information to diagrams.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Energy transfer, energy, generate, survive, fuel, provide, releases, calories.	Nutrition nutrients, functions, vital, carbohydrates, protein, fats, vitamins, absorb.	Nutrition nutrients, carbohydrates, protein, fats, vitamins, absorb, essential.	Bones, tibia, femur, ribs, humerus, ulna, radius etc, system, protect, frame, support.	Vertebrate, invertebrate, skeleton, endoskeleton, exoskeleton, classify.	Muscular, muscles, joints, tendons, (triceps, biceps), antagonistic, pull force, push force

New Learning | Prior Learning

TEACH IT: Animals, including Humans

Year 3/4 Cycle A

Key Objectives (Statutory)	Key Skills Objectives		Vocabulary
Describe the simple functions of the basic parts of the digestive system in humans.	**Explaining Science** **Y2:** Use key science words. **Y3:** Remember science words used before. **Y4:** Use and apply simple science words correctly.	**Making Conclusions** **Y2:** Describe features & patterns in data. **Y3:** Describe simple patterns in data, charts and graphs. **Y4:** Describe patterns, trends and relationships.	Teeth, incisor, canine, molar, pre-molar, acid, bacteria, plaque, enamel, digestion, mouth, gullet (oesophagus), stomach, small intestine, large intestine, anus, liver, pancreas, food chain, producer, consumer, predator, prey, carnivores, herbivores, omnivores
• Describe the simple functions of the basic parts of the digestive system in humans.	**Y2:** Use key science words. **Y3:** Begin to use knowledge of animals including humans to describe. **Y4:** Use knowledge of animals including humans, to describe what and where.	**Y2:** Describe the changes that have happened **Y3:** Describe results by linking cause and effect. **Y4:** Describe trends and begin to use science to explain.	
• Identify the different types of teeth in humans and their simple functions.	**Y2:** Add labels and information to diagrams with support. **Y3:** Add labels and information to diagrams independently. **Y4:** Annotate diagrams to help describe and explain.		

Key Conceptual Knowledge And Understanding

Animals, including humans: kingdoms

⇒ Food is a balance of nutrients that the body needs.
⇒ There are several essential nutrients that have different functions: water-vital for life; vitamins, minerals and fibre-keep us healthy; carbohydrates-give us energy; proteins-help us to grow; fats-gives us energy, absorbs vitamins and helps nerves and brains. A small amount of fat is an essential part of a healthy diet.
⇒ The human body has different systems to survive.
⇒ The skeleton is a system, which acts as a frame to support and protect the body and allow movement.
⇒ Bones are alive and blood runs through them.
⇒ Muscles are a system. There are three main muscle types in the body: skeletal muscle, cardiac muscle and smooth muscle.
⇒ Muscles work in pairs to cause movement. Muscles move bones using forces.
⇒ There are four different types of teeth: incisors-cutters; canines-grippers and tearers; pre-molars and molars-crushers and grinders.
⇒ There is a digestive system, which has different parts to it that help the body to digest food and liquids. The mouth: food is chewed by the teeth and mixed with saliva. The oesophagus: the tube that carries food (bolus) from the mouth to the stomach. The stomach: the organ that starts to digest food using acids and enzymes. The small intestine: absorbs products from digestion into the bloodstream. The large intestine: anything left is collected and passed on its way out of the body.
⇒ A food chain shows the link between living things.
⇒ It shows how food energy is passed along through different creatures by feeding.
⇒ Some animals belong to more than one food chain.
⇒ In a food chain arrows show the direction in which the food energy flows.
⇒ A predator is an animal that naturally hunts, kills and eats other living things.
⇒ Prey is an animal that is hunted and killed by another for food.
⇒ Producers produce their own food from soil, water and air. No animal can produce their own food.
⇒ Consumers are animals that eat other living things.

Year 3/4 Cycle A Science	Unit of Learning: Animals, including Humans				
Teaching and Learning Sequence for this Unit.					
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What teeth do humans have? What do they do?	**What do fizzy drinks do to our teeth?** Which other foods contain acid?	**What is digestion?** How do our teeth and mouth help digestion?	**What are the parts of the digestive system?** How does this process work?	**What is a food chain?** What does a food chain show?	**How do I construct and interpret a food chain?** What can I find out from these food chains? What is the difference between a food chain and a food web?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• There are four different types of teeth: incisors-cutters; canines-grippers and tearers; pre-molars and molars-crushers and grinders.	• The sugar in fizzy drinks feeds bacteria in the mouth, which then produce acids that attack the enamel.	• There is a digestive system, which has different parts to it that help the body to digest food and liquids. The mouth: food is chewed by the teeth and mixed with saliva.	• The human body has different systems to survive. • The mouth: food is chewed by the teeth and mixed with saliva. The oesophagus: the tube that carries food (bolus) from the mouth to the stomach. The stomach: the organ that starts to digest food using acids and enzymes. The small intestine: absorbs products from digestion into the bloodstream. The large intestine: anything left is collected and passed on its way out of the body.	• All living things need energy. They get this energy from food. A food chain shows how energy is passed between plants and animals. • Humans are part of a food chain too. • If one part of a food chain is taken away, it will affect all other creatures in the chain • It shows how food energy is passed along through different creatures by feeding. • Some animals belong to more than one food chain.	• In a food chain arrows show the direction in which the food energy flows. • A predator is an animal that naturally hunts, kills and eats other living things. • Prey is an animal that is hunted and killed by another for food. • Producers produce their own food from soil, water and air. No animal can produce their own food. • Consumers are animals that eat other living things.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Use simple science words correctly.	Describe patterns, trends and relationship.	Use and apply science words correctly.	Use and apply science words correctly.	Use and apply science words correctly.	Use and apply science words correctly.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Types, incisors, canines, pre-molars, molars.	Contain, sugar, acid, bacteria, erode, attack, enamel, cavities.	System, digest, digestive, digestion, saliva.	System, digest, process, oesophagus, enzymes, intestine, absorb.	Food energy, transferred, link, chain, creatures, feeding.	Food energy, flow, predator, prey, producer, consumer.

New Learning | Prior Learning

TEACH IT: Electricity

YEAR 3/4 CYCLE A

KEY OBJECTIVES (STATUTORY)	KEY SKILLS OBJECTIVES		VOCABULARY
• 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 a lamp will light in a simple series circuit, based on whether 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 a lamp lights in a simple series circuit. • Recognise some common conductors and insulators, and associate metals with being good conductors.	**EXPLAINING SCIENCE** **Y2:** Use key science words. **Y3:** Remember science words used before. **Y4:** Use and apply simple science words correctly. **Y2:** Use key science words. **Y3:** Begin to use knowledge of energy transfer to describe. **Y4:** Use knowledge of energy transfer to describe what and where. **Y2:** Add labels and information to diagrams with support. **Y3:** Add science labels and information to diagrams. **Y4:** Annotate diagrams to help describe and explain.	**MAKING CONCLUSIONS** **Y2:** Describe simple features and patterns in data and charts **Y3:** Describe simple patterns in data. **Y4:** Describe simple patterns, trends and relationships in data. **Y2:** Describe changes that have happened. **Y3:** Describe results by linking cause and effect. **Y4:** Use science words to explain trends.	Electric (electricity), source, energy, transfer, flow, closed / open circuits, series, cell, battery, positive, negative, wire, bulb, buzzer, motor, switch, clip, light, sound, conductor, insulator, metal, copper, iron, steel, non-metals, plastic, wood, glass, rubber, pattern, trend, relationship, conclusion, valid (validity).

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

ELECTRICITY - ENERGY TRANSFER

⇒ Some appliances need electrical energy to work.
⇒ Electricity comes from a source (battery, power stations, solar/wind).
⇒ There are risks associated with the use of electricity therefore it must be used safely.
⇒ Conductors allow electrical energy to pass through them.
⇒ Insulators do not allow electrical energy to pass through them.
⇒ Resistance measures how well a material or object conducts electricity.
⇒ Electrical energy transfers around a circuit to make components work.
⇒ Electrical energy is transferred from the battery to the bulb along the wire.
⇒ Energy is lost at the bulb as light/heat energy.
⇒ The surplus electrical energy from the bulb flows back to the battery.
⇒ A switch connects (closed) or breaks (open) the circuit. This controls of electrical energy to turn the circuit on or off.
⇒ Voltage is a measure of the amount of energy transferred.

Year 3/4 Cycle A Science	Unit of Learning: Electricity			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
How do we use electricity in our homes? Where does electricity come from and how does it get to our homes?	**What is a simple series circuit?** What components can it have and what are their functions? Can we explain and label a simple series circuit diagram?	**Can we make a working series circuit?** Which components can we use? Can we explain and draw circuit diagrams?	**How does a switch work?** Can we explore the types of switches that different devices have? Can we make our own switch using a paperclip or pins?	**What are electrical conductors and insulators?** Which materials allow electrical energy to flow? Which metals are the best conductors? How do we know?
Key Knowledge	**Key Knowledge**		**Key Knowledge**	**Key Knowledge**
• Some appliances need electrical energy to work. • Electricity comes from a source (battery, power stations, solar/wind). • There are risks associated with the use of electricity therefore it must be used safely.	• A simple series circuit in is a basic electrical circuit where all components are connected in a single loop, forming one continuous path for electricity to flow. If one part of the circuit is broken, the entire circuit stops working. • Electrical energy transfers around a circuit to make components work. • Electrical energy is transferred from the battery to the bulb along the wire. • Energy is lost at the bulb as light/heat energy. • The surplus electrical energy from the bulb flows back to the battery. • Voltage is a measure of the amount of energy transferred.		• A switch connects (closed) or breaks (open) the circuit. This controls of electrical energy to turn the circuit on or off.	• Conductors allow electrical energy to pass through them. • Insulators do not allow electrical energy to pass through them. • Resistance measures how well a material or object conducts electricity.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Remember and use science words correctly. Use knowledge of energy transfer to describe.	Use knowledge of energy transfer to describe. Use knowledge of energy transfer to describe.	Use knowledge of energy transfer to describe. Plan a fair test by selecting variables to change and measure.	Use knowledge of energy transfer to describe.	Describe trends and use energy transfer model to explain.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Electric, electricity, appliance, electrical energy, sound energy, light energy, food energy, source.	Loop, continuous, components, connected, path, circuit, electrical energy, transfer, surplus, voltage.	Loop, continuous, components, connected, path, fair, constant, change, variables, measure.	Loop, continuous, components, connected, path, circuit, electrical energy, transfer, surplus, voltage, switch, break.	Conduct, conductor, insulate, insulator, electrical energy, resist, resistance.

New Learning | Prior Learning

TEACH IT: Plants

YEAR 3/4 CYCLE A

KEY OBJECTIVES (STATUTORY)

- 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 lifecycle of flowering plants, including pollination, seed formation and seed dispersal.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y2: Use key science words.
Y3: Remember science words used before.
Y4: Use simple science words correctly (meaning; apply).

Y2: Use key science words.
Y3: Begin to use knowledge of plants to describe.
Y4: Use knowledge of plants to describe what and where.

Y2: Add labels and information to diagrams with support.
Y3: Add labels and information to diagrams independently.
Y4: Annotate diagrams to help describe and explain.

DESIGNING EXPERIMENTS

Y2: Suggest what might happen in an investigation.
Y3: Predict cause and effect and identify it in investigation.
Y4: Predict a trend (relationship prediction).

Y2: Identify the cause variable correctly.
Y3: Suggest a range for a variable.
Y4: Suggest a data range and interval for a variable

MAKING CONCLUSIONS

Y2: Describe features & patterns in data.
Y3: Describe simple patterns in data, charts & graphs.
Y4: describe patterns, trends and relationships in data.

Y2: Describe the changes that have happened
Y3: Describe results linking cause & effect.
Y4: Use science words to explain trends.

VOCABULARY

Life cycle, leaf, mid-rib, leaf-veins, petiole, stem, xylem vessels, flower, bud, petal, sepal, anther, filament, stigma, pollen, style, ovary, ovule, shoot, root, tap root, lateral root, root hairs, seed, seed coat (testing), bulb, grow, radicle, plumule, cotyledon, seedling, adult, water, light, temperature, survive, reproduction, absorb (absorbed), transported, healthy, nutrients, carbon dioxide, oxygen, germinate (germination), pollen, pollination, fertilise (fertilisation), dispersal, variable, cause, effect, prediction, pattern, comparative test, fair test, method, relationship, trend, data range, data interval.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ Plants grow from seeds or bulbs
⇒ A seed is a store of energy.
⇒ Germination is the process of a seed developing into a plant.
⇒ A seed needs water and warmth to germinate.
⇒ Some plants grow first from a seed and then develop a bulb that helps them to grow back year after year.
⇒ Plants need warmth and water to grow but to remain healthy they also need air, soil and space.
⇒ Most plants have stems, leaves and roots and some have flowers.
⇒ The different parts of a plant have a particular function. The flower attracts insects, causes pollination and its job is to make seeds; leaves make food for the plant; the stem supports the leaves and transports water and nutrients, and the roots anchor the plants to the ground and absorb water from the soil.
⇒ Leaves make food for the plant through a process called photosynthesis. The leaf takes in sunlight, water (from the roots) and carbon dioxide from the atmosphere and turns it into glucose (self-made food). This is then transported around the plant to help make new roots, stems, leaves and flowers. Plants also excrete oxygen for life to exist on Earth.
⇒ Water is moved within plants from the roots to the stem; the stem then transports this water as well as nutrients from the roots through to the rest of the plant; the stem also sends food down to the roots and the rest of the plant from the leaves.
⇒ Flowers support reproduction through pollination, seed formation and seed dispersal; these are the processes that take place during the flowering plants lifecycle.
⇒ The flower has different parts that have different functions: the petal attracts insects; the sepal protects the bud. The male parts of the plant-the stamen- produces pollen which then can be carried from another plant to the female part-the stigma-for reproduction.
⇒ Pollination is the transfer of pollen (fine powder made by the anther) to itself or another flower to make seeds. Insects are vital for pollination as they distribute pollen so does wind. Insects do not eat pollen; they eat the nectar from flowers and get accidentally dusted with pollen.

Year 3/4 Cycle A Science	Unit of Learning: Plants					
Teaching and Learning Sequence for this Unit.						
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
Can you remember the parts of a plant? What are the parts of a flowering plant and what do they do?	**Do all plants need the same conditions to grow and live?** Can we remember all of the characteristics of living things?	**How do leaves make food for the plant?** What can we learn about photosynthesis? What gives leaves their green colour?	**How does water get around the plant?** What do you notice when you give carnations water with coloured dye in?	**What are the parts of a flower and why do plants have flowers?** What are the reproductive parts of a flower?	**What is pollination?** Which insects pollinate flowers? Why are bees so important?	**How do plants spread their seeds?** Which seeds are dispersed by wind? Animals? Does wind speed affect how far seeds will disperse?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Most plants have stems, leaves and roots and some have flowers. • The different parts of a plant have a particular function. The flower attracts insects, causes pollination and its job is to make seeds; leaves make food for the plant; the stem supports the leaves and transports water and nutrients, and the roots anchor the plants to the ground and absorb water from the soil.	• Plants need warmth and water to grow but to remain healthy they also need air, soil and space.	• Leaves make food for the plant through a process called photosynthesis. • The leaf takes in sunlight, water (from the roots) and carbon dioxide from the atmosphere and turns it into glucose (self-made food). This is then transported around the plant to help make new roots, stems, leaves and flowers. • Plants also excrete oxygen for life to exist on Earth.	• Water is moved within plants from the roots to the stem; the stem then transports this water as well as nutrients from the roots through to the rest of the plant; the stem also sends food down to the roots and the rest of the plant from the leaves.	• Flowers support reproduction through pollination, seed formation and seed dispersal; these are the processes that take place during the flowering plants lifecycle. • The flower has different parts that have different functions: the petal attracts insects; the sepal protects the bud. The male parts of the plant-the stamen-produces pollen which then can be carried from another plant to the female part-the stigma-for reproduction.	• Pollination is the transfer of pollen (fine powder made by the anther) to itself or another flower to make seeds.	• Insects are vital for pollination as they distribute pollen so does wind. Insects do not eat pollen; they eat the nectar from flowers and get accidentally dusted with pollen.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Begin to use knowledge of plants to describe	Describe patterns in data, charts and graphs.	Begin to use knowledge of plants to describe.	Describe results linking cause and effect.	Begin to use knowledge of plants to describe.	Remember science words.	Identify cause and effect in investigations.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Function, part, attract, support, anchor	MRS GREN, growth, thrive, conditions.	Food, energy, photosynthesis, sunlight, glucose.	Transport, roots, stem, nutrients, leaves, hydrate.	Reproduction, pollination, lifecycle, processes, functions.	Pollination, pollen, seeds, flowers, insects.	Seeds, disperse, wind, excretion, pollen, insects.

Year 3/4

Cycle B

New Learning | Prior Learning

TEACH IT: States of Matter

Year 3/4 Cycle B

Key Objectives (Statutory)

- 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 parts played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Key Skills Objectives

Explaining Science

Y2: Use key science words.
Y3: Remember science words used before.
Y4: Use and apply simple science words correctly.

Y2: Use key science words.
Y3: Begin to use knowledge of particles to describe.
Y4: Use knowledge of particles to describe what and where.

Y2: Add labels and information to diagrams with support.
Y3: Add science labels and information to diagrams.
Y4: Annotate diagrams to help describe and explain.

Designing Experiments

Y2: Suggest what might happen in an investigation
Y3: Predict cause and effect.
Y4: Make a relationship prediction.

Y2: Notice risk in my investigation and know common dangers.
Y3: Identify obvious risk and act on safety suggestions.
Y4: Notice obvious risks and describe safe use.

Y2: Describe the changes that have happened
Y3: Identify cause and effect in an investigation.
Y4: Plan a fair test by selecting variables to change and measure.

Vocabulary

Material, substance, solid, liquid, gas, flow, compressed, volume, density, state, particle, energy, movement, collision, attraction, heat, temperature (°C), ice, water, water vapour, melting, boiling, freezing, condensation, evaporation, speed (rate), melting point, boiling point, water cycle, run-off, rainfall (precipitation), variable, cause, effect, prediction, comparative test, fair test, pattern, method, relationship, trend, data range, data interval.

Key Conceptual Knowledge And Understanding

States of Matter: Particles

⇒ Everything in the universe is made up of particles.
⇒ A particle is a tiny piece of matter (anything that has weight and takes up space) which cannot be seen through the naked eye.
⇒ There are three states of matter: Solids, Liquids and Gases.
⇒ Particles are in constant motion.
⇒ They move because they have energy.
⇒ The more energy they have; the more movement and the less energy they have; the less movement.
⇒ The particles in a solid have much less energy and can only vibrate which holds their fixed position.
⇒ The particles in a liquid have more energy than a solid, they move more quickly but still pack closely together and flow over each other.
⇒ The particles in a gas have the most energy and therefore move very quickly so they collide and spread out.
⇒ Heating particles results in more energy and more movement and leads to a change of state.
⇒ Cooling particles results in less energy and less movement and leads to a change of state.

Year 3/4 Cycle B Science	Unit of Learning: States of Matter				
Teaching and Learning Sequence for this Unit.					
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What makes something a solid, liquid or a gas? What common solids, liquids and gases do we know?	What are solids, liquids and gases made up of? What do we already know about particles? How could we demonstrate the particles in a solid, a liquid and a gas?	Can we group materials according to whether they are solids, liquids or gases? Can some things belong to more than one group?	What happens when a substance changes state? What other materials can be changed by heating or cooling?	What is evaporation and condensation? How does temperature/surface area/substance affect the speed of evaporation? Condensation?	What happens in the water cycle? What part do evaporation and condensation play within the water cycle?
Key Knowledge	**Key Knowledge**		**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Everything in the universe is made up of particles. • A particle is a tiny piece of matter (anything that has weight and takes up space) which cannot be seen through the naked eye. • There are three states of matter: Solids, Liquids and Gases.	• Particles are in constant motion. • They move because they have energy. • The more energy they have; the more movement and the less energy they have; the less movement. • The particles in a solid have much less energy and can only vibrate which holds their fixed position. • The particles in a liquid have more energy than a solid, they move more quickly but still pack closely together and flow over each other. • The particles in a gas have the most energy and therefore move very quickly so they collide and spread out.		• Heating particles results in more energy and more movement and leads to a change of state. • Cooling particles results in less energy and less movement and also leads to a change of state.	• Evaporation is the process where a liquid changes into a gas (water vapour). • Condensation is the opposite process where a gas turns back into a liquid.	• Evaporation: water from oceans, lakes, and rivers turns into water vapour and rises into the atmosphere. • Condensation: when this water vapour colours and forms clouds. • Precipitation: water falls back to earth as rain, snow or hail. • The water then returns to the oceans, lakes and rivers, restarting the cycle.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Use and apply science words correctly.	Begin to use knowledge of particles to describe.	Use and apply science words correctly.	Plan a fair test by selecting variables to change and measure.	Plan a fair test by selecting variables to change and measure.	Begin to use knowledge of particles to describe.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Particles, matter, states, solid, liquid, gas, weight, space.	Particles, constant, motion, energy, movement, vibrate, flow.	Particles, constant, motion, energy, movement, vibrate, flow.	Heating, cooling, particles, energy, movement, state.	Process, vapour, condenses, evaporates, liquid, gas.	Evaporation, condensation, precipitation, cycle.

New Learning | Prior Learning

TEACH IT: Living Things & Habitats

YEAR 3/4 CYCLE B

KEY OBJECTIVES (STATUTORY)

- 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.

KEY SKILLS OBJECTIVES

CLASSIFICATION

Y2: Group by difference, similarity or change.
Y3: Create groups for sorting.
Y4: Create appropriate groups for sorting (create criteria).

Y2: Use simple spider keys with obvious differences.
Y3: Use classification keys with obvious differences.
Y4: Use classification keys with fine differences.

Y2: Link properties of materials to an application.
Y3: Combine properties required for application with help.
Y4: Describe combined properties required for an application.

DATA, TABLES AND GRAPHS

Y2: Use a simple table recording in words and numbers, including a tally.
Y3: Use a frame to construct a simple table of results.
Y4: Construct a simple table to compare cause and effect.

Y2: Construct simple pictograms and block charts.
Y3: Use a frame to construct a bar chart with help.
Y4: Construct bar charts correctly (including numerical axes).

Y2: Use the scale on a block chart to add the correct blocks.
Y3: Draw bars on a bar chart.
Y4: Plot coordinates on a graph in the first quadrant.

VOCABULARY

Spores, seed cones, organism, Micro-organism, biodiversity, ecosystem, environment, habitat, micro-habitat, key, classification, animal, vertebrate, fish, amphibian, reptile, bird, mammal, invertebrate, snails, slugs, spiders, woodlice, insects, worms, plants, trees, flowering plants (grasses, etc), non-flowering plants (conifers, ferns, mosses)

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ Something that was once alive used to be able to do these things; something that has never been alive can't do these things.
⇒ Most organisms (a single living thing) live in habitats; they are a natural place for animals and plants to live, grow and feed.
⇒ Different animals and plants are more suited to a particular habitat than others.
⇒ Different include polar, oceanic, woodland, rainforest, urban, desert, coastal and pond. Micro-habitats are smaller in scale e.g. rock pools.
⇒ Woodland habitats are green and shady and are part of our local environment.
⇒ All animals and plants need food to live, and they are all part of a food chain.
⇒ All living things need energy. They get this energy from food. A food chain shows how energy is passed between plants and animals. Humans are part of a food chain too.
⇒ If one part of a food chain is taken away, it will affect all other creatures in the chain
⇒ Plants make food using energy from the sun. They are called producers.
⇒ Animals are called consumers because they eat plants and other animals; animals that eat other animals are called predators.
⇒ Animals that are eaten are called prey.
⇒ Animals with backbones are called vertebrates; animals without backbones are called invertebrates.
⇒ Living things can be divided or sorted into different groups using a classification key.
⇒ A classification key is a series of questions used to identify living things and can unlock the identity of them.
⇒ Animals with backbones are called vertebrates; mammals, reptiles, amphibians, birds and fish are all vertebrates.
⇒ Animals without backbones are called invertebrates; insects, worms, jellyfish, snails and sea sponges are all invertebrates.
⇒ Animals can be divided into vertebrates and invertebrates and plants can be divided into flowering or non-flowering to classify them.
⇒ Flowering plants reproduce using flowers to make seeds; non-flowering plants reproduce using spores and seed cones. Spores are minute organisms that do not need fertilisation to grow into a new individual.
⇒ A community of animals, plants and microorganisms, together with their habitat is called an ecosystem.
⇒ If one part of an ecosystem is changed, this may affect other living things in the ecosystem.

Year 3/4 Cycle B Science	Unit of Learning: Living Things & their Habitats				
Teaching and Learning Sequence for this Unit.					
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
Can we remember the 7 characteristics of living things? Which of these things are living/non-living? Can we prove it?	**How is the animal kingdom classified?** Which animals are vertebrates/invertebrates? Which of these are warm-blooded/cold-blooded?	**What groups can plants be classified into?** Do all plants reproduce in the same way?	**What living things can we find in a local woodland habitat?** How can we identify and record what we find?	**What is an ecosystem?** What are the features of a healthy ecosystem? Is the amazon rainforest a healthy ecosystem?	**What negative effects can humans have on ecosystems and their habitats?** What can we do to prevent this?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Characteristics of living things-MRS GREN: **Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion, Nutrition.** • Something that was once alive used to be able to do these things; something that has never been alive can't do these things.	• Living things can be divided or sorted into different groups using a classification key. • A classification key is a series of questions used to identify living things and can unlock the identity of them. • Animals with backbones are called vertebrates. • Animals without backbones are called invertebrates. • Animals can be divided into vertebrates and invertebrates.	• Plants can be divided into flowering or non-flowering to classify them. • Flowering plants reproduce using flowers to make seeds; non-flowering plants reproduce using spores and seed cones. Spores are minute organisms that do not need fertilisation to grow into a new individual.	• Most organisms (a single living thing) live in habitats; they are a natural place for animals and plants to live, grow and feed. • Different animals and plants are more suited to a particular habitat than others. • Different habitats include polar, oceanic, woodland, rainforest, urban, desert, coastal and pond. Micro-habitats are smaller in scale e.g. rockpools. • Woodland habitats are green and shady and are part of our local environment.	• A community of animals, plants and microorganisms, together with their habitat is called an ecosystem. • If one part of an ecosystem is changed, this may affect other living things in the ecosystem.	• A community of animals, plants and microorganisms, together with their habitat is called an ecosystem. • If one part of an ecosystem is changed, this may affect other living things in the ecosystem.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Show a developing K&U of science.	Use classification keys with fine differences.	Use classification keys with fine differences.	Construct a table and bar chart.	Show a developing K&U of science.	Show a developing K&U of science.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Movement, respiration, sensitivity, growth, reproduction, excretion, nutrition.	Classify, classified, classification, vertebrate, invertebrate.	Classify, classified, classification, reproduce, seeds, spores, organism, fertilisation.	Organism, microorganism, habitat, polar, oceanic, urban, desert, rainforest etc.	System, ecology, ecosystem, affect, microorganisms, community.	System, ecology, ecosystem, affect, microorganisms, community, negative, positive interaction.

New Learning | Prior Learning

TEACH IT: Rocks

YEAR 3/4 CYCLE B

KEY OBJECTIVES (STATUTORY)	KEY SKILLS OBJECTIVES		VOCABULARY
• Compare and group together different kinds of rocks based on 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.	**EXPLAINING SCIENCE** **Y2:** Use key science words. **Y3:** Remember science words used before. **Y4:** use simple science words correctly (meaning; apply). **Y2:** Use key science words. **Y3:** Begin to use knowledge of particles to describe. **Y4:** use science models to describe what and where. **Y2:** Add labels and information to diagrams with support. **Y3:** Add labels and information to diagrams independently. **Y4:** annotate diagrams to help describe and explain.	**CLASSIFICATION** **Y2:** Use simple spider key with obvious differences. **Y3:** Use large spider key with obvious differences. **Y4:** use a range of spider keys with fine differences. **Y2:** Group by difference, similarity or change. **Y3:** Create criteria and groups for sorting. **Y4:** create appropriate groups for sorting (create criteria). **Y2:** Link properties of materials to an application. **Y3:** Combine properties of materials required for an application. **Y4:** Describe combined properties required for an application.	Rocks (e.g. sandstone, limestone, chalk, shale, coal, conglomerate, granite, slate, marble, basalt, obsidian, pumice, etc), texture, crystals, minerals, sedimentary, layers / bands, metamorphic, heat, pressure, igneous, magma, larva, fossil (body, trace, cast, mould), petrification, soil, clay, silt, sand, organic matter, key, spider key, criteria, classify (classification), sort, group, material, property, application.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ Everything in the universe is made up of particles.
⇒ A particle is a tiny piece of matter (anything that has weight and takes up space) which cannot be seen through the naked eye.
⇒ There are three states of matter: Solids, Liquids and Gases.
⇒ The particles in a solid are very close together, therefore they cannot usually be compressed or squashed.
⇒ The particles in a solid are arranged in a regular way, which gives them a fixed shape.
⇒ Rocks are solid objects that are made up of one or more minerals.
⇒ Rocks can be broken up into smaller pieces.
⇒ Eventually they can be broken up into particles which are too small to see.
⇒ Soil is made of very fine rock particles that have mixed with water, air and particles from dead animals and plants.
⇒ Living things trapped in sedimentary rock can form fossils.

Year 3/4 Cycle B Science	Unit of Learning: Rocks			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What do we already know about rocks? How can we group different rocks together using their appearance and physical properties?	**What are rocks made of?** What are the different ways that rocks are formed? What are rocks used for?	**How are rocks classified?** What similarities and differences do they have?	**What is a fossil?** How are fossils formed? Where can fossils be found?	**What is soil?** What is soil made from? What are the different types of soil?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Everything in the universe is made up of particles. • A particle is a tiny piece of matter (anything that has weight and takes up space) which cannot be seen through the naked eye. • The particles in a solid are very close together, therefore they cannot usually be compressed or squashed. • The particles in a solid are arranged in a regular way, which gives them a fixed shape.	• Rocks are solid objects that are made up of one or more minerals. • Rocks can be broken up into smaller pieces. • Eventually they can be broken up into particles which are too small to see.	• Rocks are classified into three main types based on how they are formed: igneous, sedimentary, and metamorphic.	• Living things trapped in sedimentary rock can form fossils through the process of fossilisation. • Particles refer to the tiny pieces of rock and sediment that make up sedimentary rocks where fossils are found and play a role in the fossilisation process. • The most common fossils found are of creatures that lived in the sea, because the sediment moves quickly in water and so any creatures that die are usually covered up.	• Soil is made of very fine rock particles that have mixed with water, air and particles from dead animals and plants. • Different soils have different properties depending on their composition. • Common types of soils, based on their texture, are sandy, silt, clay and loam. •
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Create groups for sorting.	Combine properties of materials required for an application.	Create groups for sorting.	Begin to use knowledge of particles to describe.	Remember science words used before.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Particles, matter, chalk, coal, marble, granite etc, texture, hardness, permeability, durability, appearance.	Minerals, particles, properties, suitability, purposes, formation, magma, lava, sediment, igneous, layers, metamorphic.	Igneous, sedimentary, metamorphic, properties, permeability, durability, appearance, colour, texture, criteria, spider key, sort.	Sedimentary, layers, conditions, fossilisation, sediment, process, natural, particles.	Rock particles, water, air, animal, plant, matter, types, properties, composition.

New Learning | Prior Learning

TEACH IT: Light

YEAR 3/4 CYCLE B

KEY OBJECTIVES (STATUTORY)

- Recognise that light is needed 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 the 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.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y2: Use key science words.
Y3: Remember science words used before.
Y4: Use simple science words correctly (meaning; apply).

Y2: Use key science words.
Y3: Begin to use knowledge of energy transfer to describe.
Y4: Use science models to describe what and where.

Y2: Add labels and information to diagrams with support.
Y3: Add labels and information to diagrams independently.
Y4: Annotate diagrams to help describe and explain.

DESIGNING EXPERIMENTS

Y2: Suggest what might happen in an investigation.
Y3: Predict cause and effect.
Y4: predict a trend (relationship prediction).

Y2: Use a range of science equipment correctly.
Y3: Select suitable equipment.
Y4: select and use suitable equipment for the task.

Y2: Follow short, spoken and written, instructions.
Y3: Follow written instructions.
Y4: design and write a simple ordered method (from plan).

VOCABULARY

Light, dark, energy, quantity, transfer, source, eye, reflected, reflection, reflective, shiny, dull, transmitted, transparent, translucent, opaque, blocked, shadow, absorbed, variable, cause, effect, prediction, fair test, method, relationship, trend, data range, data interval.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ Light can come from different sources.
⇒ Light is needed to see things. Dark is the absence of light.
⇒ Light from the sun can be dangerous. Eyes and skin need to be protected from sunlight.
⇒ Light is a form of energy that enable things to be seen.
⇒ Light energy travels from a source through a medium (solids, liquids or gas) to your eye.
⇒ There are natural and artificial sources of light energy.
⇒ Light can be reflected from surfaces (reflected light energy).
⇒ Shadows are formed when light energy is blocked by an object (shadow=absence of transmitted light energy).
⇒ The closer an object is to the source of the light, the larger the shadow it casts.

Year 3/4 Cycle B Science	Unit of Learning: Light			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What is light? Where does light come from? What different types of light sources are there and how can we group them? Which sources transfer more/less light energy?	**What materials reflect light?** Which materials are the most reflective? How do we measure reflected light energy?	**What materials let light through?** Which materials let most light through? How does the transfer of light energy differ when transmitted through opaque/translucent/transparent materials?	**What is a shadow?** How is a shadow formed? What happens to the size of a shadow when an object moves closer to the light source?	**Why can strong light be dangerous?** How can we protect our eyes and skin from the sun? How do sunglasses alter the transfer and amount of light energy?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Light is a form of energy that enable things to be seen. • Light can come from different sources. • Light is needed to see things. Dark is the absence of light. • There are natural and artificial sources of light energy.	• Light energy travels from a source through a medium (solids, liquids or gas) to your eye. • Light can be reflected from surfaces (reflected light energy).	• Materials can be classified by how much light they allow to pass through them. • Opaque materials do not let light pass through them. • Transparent materials allow light through them. • Translucent materials allow some light to pass through them.	• Shadows are formed when light energy is blocked by an object (shadow=absence of transmitted light energy). • The closer an object is to the source of the light, the larger the shadow it casts.	• Light from the sun can be dangerous. Eyes and skin need to be protected from sunlight. • Too much ultraviolet (UV) light from the sun can be dangerous. • We can protect our skin by wearing sun cream and our eyes by wearing sunglasses, but we should still never look directly at the sun. • Different types of sunglasses give better/worse protection from UV rays.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Begin to use knowledge of energy transfer to describe.	Predict using cause and effect.	Predict using cause and effect.	Predict using cause and effect.	Begin to use knowledge of energy transfer to describe.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Light, dark, source, energy, heat energy, light energy, absence, natural, artificial, enable.	Light energy, travels, source, medium, reflect, reflected, reflective, surface, absorb, transfer.	Materials, classify, opaque, transparent, translucent, transmitted, absorbed, reflected, transfer, energy.	Dark, block, absorb, opaque, transparent, translucent, source, shadow, investigate, predict, compare.	Ultraviolet, heat energy, light energy, damage, protect, transfer, directly.

New Learning | Prior Learning

TEACH IT: Sound

YEAR 3/4 CYCLE B

KEY OBJECTIVES (STATUTORY)

- 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.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y2: Use and remember science words over time.
Y3: Remember science words used before.
Y4: Use and apply simple science words correctly.

Y2: Use science to describe/recall what is seen.
Y3: Begin to use knowledge of energy transfer to describe.
Y4: Use knowledge of energy transfer to describe what and where.

Y2: Add science labels and information (with help) to diagrams.
Y3: Add science labels and information to diagrams.
Y4: Annotate diagrams to help describe and explain.

DESIGNING EXPERIMENTS

Y2: Suggest what might happen in my investigation.
Y3: Predict cause and effect.
Y4: Make a relationship prediction.

Y2: Suggest an idea to investigate from observations.
Y3: Identify cause and effect in an investigation.
Y4: Plan a fair test by selecting variables to change and measure.

Y2: Identify variables in investigations (label & describe).
Y3: Suggest a suitable data range for a variable.
Y4: Suggest a data range and interval for a variable.

VOCABULARY

Sound, energy, transfer, source, ear, particles, solid, liquid, gas, vibration, volume, decibels, frequency, pitch, Hertz, reflected, transmitted, absorbed, fainter / louder, lower / higher, variable, cause, effect, prediction, comparative test, fair test, pattern, method, relationship, trend, data range, data interval.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

ENERGY TRANSFER / PARTICLES

⇒ Everything in the universe is made up of particles.
⇒ Particles are in constant motion.
⇒ They move because they have energy.
⇒ Light energy travels from a source through a medium (solids, liquids or gas) to your eye.
⇒ Sound energy/vibrations travel from a source through a medium (solids, liquids and gas) to the ear.
⇒ Sound energy causes particles to vibrate which collide with others, transferring their energy across.
⇒ Energy is lost at each collision.
⇒ The volume of sound is linked to the strength of the vibrations (sound energy) that produce it.
⇒ The pitch of a sound is linked to the frequency of the vibrations (sound energy) that produce it.

Year 3/4 Cycle B Science	Unit of Learning: Sound			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What is a sound? How can we make sounds using these different instruments? How are these sounds made? How do we know? (water ripples)	**How does a sound travel to our ears?** How can we suggest the route sound takes to get to the ear? Source-through medium-to ear.	**How does the length/type of string affect the volume of sound we hear?**	**How can we change the volume of a sound?** What happens when we move further away from a sound source?	**How can we change the pitch of a sound?** How does the tension/thickness/length of an elastic band affect the pitch of sound?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Everything in the universe is made up of particles. • Particles are in constant motion. • They move because they have energy. • Sound is an energy that is created by vibrations.	• Light energy travels from a source through a medium (solids, liquids or gas) to your eye. • Sound energy/vibrations travel from a source through a medium (solids, liquids and gas) to the ear. • Sound energy causes particles to vibrate which collide with others, transferring their energy across.	• Sound energy/vibrations travel from a source through a medium (solids, liquids and gas) to the ear. • Sound energy causes particles to vibrate which collide with others, transferring their energy across. • Energy is lost at each collision.	• The volume of sound is linked to the strength of the vibrations (sound energy) that produce it.	• The pitch of a sound is linked to the frequency of the vibrations (sound energy) that produce it.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Use knowledge of energy transfer to describe.	Use knowledge of energy transfer to describe.	Plan a fair test by selecting variables to change and measure.	Suggest a data range and variable for the cause variable.	Plan a fair test by selecting variables to change and measure.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Particles, motion, vibration, energy, sound energy, instruments.	Light energy, sound energy, source, medium, vibrations, transfer, travel.	Affect, test, variables, fair, change, measure, constant, collide, transfer, energy.	Volume, vibrations, strength, energy, data, variables, decibels.	Affect, test, variables, fair, change, measure, constant, pitch, frequency.

New Learning | Prior Learning

APPLY IT: Working Scientifically

YEAR 3/4

CHILDREN SHOULD BE SUPPORTED TO DEVELOP THEIR UNDERSTANDING OF SCIENTIFIC IDEAS BY USING DIFFERENT TYPES OF SCIENTIFIC ENQUIRY THROUGHOUT ALL TEACHING.

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 programmes 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.

POSSIBLE SCIENTIFIC INVESTIGATIONS:

CYCLE A

Forces and Magnets: • What happens to the distance an object can be moved when we increase the push force? • What big a splat does a water bomb make when it is dropped from different heights? • How does the height at which we drop a ball affect how high it bounces? • Which magnet is the strongest? • Which materials weaken a magnet?	**Animals, including humans:** • Which fruits contain the most water? • What food groups do different types of food contain and which are highest in energy?	**Animals, including humans:** • What happens if we don't clean our teeth? • What do fizzy drinks do to our teeth? Chicken bones in vinegar, water, air. Action of acid. Explore acidic foods/drinks using litmus paper. • Does surface area of food affect the speed of digestion in the stomach? Cut jelly babies and dissolve in white vinegar. Time taken to dissolve.	**Electricity:** • Which materials allow electrical energy to flow?	**Plants:** • Does grass grow better in wetter/lighter/warmer conditions? • Does the amount of water provided affect the growth of plants? • Does wind speed affect how far dandelion seeds disperse? • Does the weight of a sycamore seed affect how far it disperses?

CYCLE B

States of Matter • Which type of sponge holds the most air? • How many drops of liquid can you add to a penny? Does the type of liquid effect the number of drops added? • What is the best way to melt ice cubes? • How can we make chocolate melt faster? • Which materials dry the fastest? • How does the temperature/surface area/substance effect the speed of evaporation (salt water, ink)?	**Living Things & Habitats** • Explore habitats over time. Tally/chart species & number counts. Compare habitats. Use number lines (tape measure) to sample an area with a quadrat. Collect data. Compare habitats	**Rocks:** • Which rock is the hardest? (scratch test) • Which soils let water drain through the fastest? • What effect does the amount of organic matter have on soil drainage?	**Light:** • Which is the most reflective material? • What happens to the amount of light passing through when we darken the water? • Which material/object/light lets most light through? • What happens to a shadow when the light source rotates around an object? • What happens to the size of a shadow when an object moves closer to a light source? • Why should we wear sunglasses to protect our eyes from sunlight; which is the best material to make sunglasses?	**Sound:** • What happens to the sound as we increase the length of the wire/width of the drum/ volume of the bottle? • What happens to vibrations when we move away from the sound source? • What are the best materials for muffling sound? • Through which type of solid does sound travel best? • What happens to the height of rice bouncing on a speaker when we alter the volume? • How does the tension/thickness/length of an elastic band affect the pitch of the sound?

Year 5/6

Science Curriculum

DISCIPLINARY KNOWLEDGE AND SCIENTIFIC ENQUIRY:
How we 'work' and 'think' like a Scientist.

YEAR 5/6

EXPLAINING SCIENCE

YEAR 5

- I show clear knowledge and understanding of science ideas and concepts.
- I begin to use complex science words correctly.
- I use science models to describe and begin to explain (why, how).
- I begin to draw and annotate my own diagrams.
- I select and prioritise facts to create an argument/answer.

YEAR 6

- I show a secure K&U across all KS2 topics (facts and concepts).
- I use complex science words correctly and fluently.
- I use science models to describe and explain (why, how, logical).
- I draw and annotate my own diagrams to describe and explain.
- I present a clear and logical argument/answer.

CLASSIFICATION

YEAR 5

- I construct spider and number keys.
- I group and subgroup by easy observation (create criteria).
- I explain how properties suit an application.

YEAR 6

- I construct both spider and number keys.
- I group and sub-group by fine observation (create criteria).
- I explain the science behind a range of properties.

DESIGNING EXPERIMENTS

YEAR 5

- I use knowledge and understanding to explain my prediction (relationship).
- I select equipment with the right scale for the task (supported).
- I begin to plan to minimise risk and work safely (consistently).
- I plan a fair test and ensure controlled variables are kept the same.
- I suggest a data range, interval and sufficient readings.
- I design and write an ordered method (controls variables).

YEAR 6

- I reason K&U to make a hypothesis (relationship).
- I select and use equipment with the right scale for the task.
- I plan to minimise risk and describe safe use of equipment.
- I plan a reliable fair test (use of variable terminology).
- I plan to collect repeat readings and calculate mean.
- I design and write an ordered and reliable method.

DATA, TABLES & GRAPHS

YEAR 5

- I measure divisions on a number line past zero (-ve values).
- I measure/convert values in standard units (inc. area).
- I use a frame to construct a complex table of results.
- I use a frame to construct a graph and can scale axes (supported).
- I join plotted co-ordinates with straight lines.

YEAR 6

- I scale up/down a number line (axis) and decide on limits.
- I measure/calculate with standard units (inc. area and volume).
- I construct a complex table to show repeated data.
- I construct graphs and can scale at least one axis independently.
- I plot mean values and draw a trend line for linear data.

MAKING CONCLUSIONS

YEAR 5

- I describe patterns, trends and relationships in data.
- I spot anomalous data that doesn't fit the pattern.
- I use data in my conclusions and use science to explain.
- I identify strengths, weaknesses and improvements.

YEAR 6

- I describe changing patterns, trends and relationships.
- I spot anomalous data and explain from the method.
- I use primary and secondary data and science ideas in my conclusions.
- I suggest limitations (date) and practical improvements.

Year 5/6

Cycle A

New Learning | Prior Learning

TEACH IT: Properties & Material Changes

YEAR 5/6 CYCLE A

KEY OBJECTIVES (STATUTORY)

- Compare and group together everyday materials based on 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.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y4: Use and apply simple science words correctly
Y5: Use complex science words correctly.
Y6: Use complex science words correctly and fluently.

Y4: Use knowledge of particles to describe what and where.
Y5: Use knowledge of particles to describe and explain why and how.
Y6: Use knowledge of particles to describe and explain (why, how, logical).

Y4: Annotate diagrams to help describe.
Y5: Draw and annotate diagrams.
Y6: Draw and annotate my own diagrams to describe and explain.

CLASSIFICATION

Y4: Describe combined properties required for an application.
Y5: Explain how properties suit an application.
Y6: Explain the science behind a range of properties.

DESIGNING EXPERIMENTS

Y4: Select and use suitable equipment.
Y5: Select suitable equipment with the most appropriate scale for the task.
Y6: Select and use equipment with the right scale for the task.

Y4: Plan a fair test by selecting variables to change and measure.
Y5: Plan a fair test and ensure that controlled variables are kept the same.
Y6: Plan a reliable fair test (use of variable terminology).

Y6: Plan to collect repeat readings and calculate mean.

VOCABULARY

Material, particle, substance, mixture, compound, state, solid, liquid, gas, melting, boiling, evaporation, condensation, freezing, energy, attraction, dissolve (dissolving), solute, solvent, soluble (solubility), insoluble, opaque, translucent, transparent (transparency), conductive (conductivity), insulating (insulation), heat, temperature, thermal, flexible (flexibility), rigid (rigidity), elastic (elasticity), absorbent (absorbency), magnetic, filtration, sieving, permeable (permeability), chromatography, chemical, physical, reaction, bond (bonded), combined, reversible, irreversible, variable, cause, effect, independent variable, dependent variable, controlled variable, data range, data interval, repetition, reliability, risk, relationship prediction, hypothesis, method.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ Particles are in constant motion.
⇒ They move because they have energy.
⇒ The more energy they have, the more movement and the less energy they have, the less movement.
⇒ The particles in a solid have much less energy and can only vibrate, which holds their fixed position.
⇒ The particles in a liquid have more energy than a solid, they move more quickly but still pack closely together and flow over each other.
⇒ The particles in a gas have the most energy and therefore move very quickly so they collide and spread out.
⇒ Heating particles results in more energy and more movement and leads to a change of state.
⇒ Cooling particles results in less energy and less movement and leads to a change of state.
⇒ A mixture is a combination of two types of particles. The particles show little attraction for each other and therefore can be separated by filtering or sieving-a reversible change.
⇒ A solution occurs when the particles in a substance get pulled apart by the water particles because there is more attraction (dissolving). Because of this they can only be separated by evaporation and chromatography (KS3) - also a reversible change.

Year 5/6 Cycle A Science	Unit of Learning: Properties & Changes of Materials			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
How does a material's property suit its role? Are some materials more transparent than others? Which material absorbs the most heat?	**What does soluble mean?** How can we find out which materials form solutions and which form mixtures? What is the difference?	**How can mixtures be separated?** What do we know at about the particles in a mixture? What techniques are there for separating mixtures?	**How can solutions be separated?** What do we know about the particles in a solution? What techniques are there for separating solutions?	**Which changes cannot be reversed and why?** What happens when: An egg is heated? When bicarbonate of soda and vinegar are mixed?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Materials have different properties which describe how a material behaves and explains why it is suited for a particular use. • To make an experiment fair, it is important to keep some variables the same and to only change the independent variable.	• Substances that dissolve in water are known as soluble. • When a substance dissolves it mixes with water to make a liquid called a solution. • When insoluble substances are mixed, they do not dissolve and form a mixture.	• A mixture is a combination of two types of particles. • The particles show little attraction for each other so they can be separated from each other using sieving or filtering. • This is a reversible change.	• A solution occurs when the particles in a substance get pulled apart by the water particles because there is more attraction. • They can only be separated by evaporation. • This is also a reversible change.	• Some changes are irreversible because the materials are permanently altered. • These changes are not just a result of mixing or heating: chemical changes occur.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
*Plan a fair test. *Explain how properties suit an application.	*Use knowledge of particles to describe and explain.	*Use knowledge of particles to describe and explain.	*Use knowledge of particles to describe and explain.	*Select appropriate equipment with the right scale.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Variable, dependent variable, independent variable.	Substance, dissolve, soluble, insoluble, solution, mixture, materials, form.	Particles, mixture, techniques, separation, filter, sieve, combination, reversible, attraction.	Particles, occur, solution, substance, attraction, separated, evaporated, techniques, reversible.	Irreversible, materials, permanently, altered, mixing, heating, chemical reaction/change.

New Learning | Prior Learning

TEACH IT: Electricity

YEAR 5/6 CYCLE A

KEY OBJECTIVES (STATUTORY)

- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.
- Compare and give reasons for variations in how components function including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.
- Use recognised symbols when representing a simple circuit in a diagram.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y4: Use simple science words correctly (meaning; apply).
Y5: Begin to use complex science words.
Y6: Use complex science words correctly.

Y4: Use knowledge of energy transfer to describe what and where.
Y5: Use knowledge of energy transfer to describe and begin to explain.
Y6: Use knowledge of energy transfer to describe and explain.

Y4: Annotate diagrams to help describe and explain.
Y5: Begin to draw and annotate own diagrams.
Y6: Draw and annotate own diagrams.

DESIGNING EXPERIMENTS

Y4: Predict a trend (relationship prediction).
Y5: Use knowledge and understanding to explain prediction.
Y6: Reason knowledge and understanding to make a hypothesis.

Y4: Plan a fair test by selecting variables to change and measure.
Y5: Plan a fair test ensuring that controlled variables are kept the same.
Y6: Plan a reliable fair test.

Y4: Predict obvious risk and work safely (mostly).
Y5: Begin to plan to minimise risk and work safely.
Y6: Plan to minimise risk and describe safe use.

VOCABULARY

Electric (electricity), source, energy, transfer, Voltage, flow, Current, resistance, insulator, conductor, closed / open circuits, series, cell, battery, positive, negative, wire, bulb, buzzer, motor, switch, clip, metal, light energy, sound energy, heat energy, kinetic energy, Voltmeter, variable, cause, effect, independent variable, dependent variable, controlled variable, data range, data interval, repetition, reliability, risk, relationship prediction, hypothesis, method, precision, error.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

Electricity: Energy Transfer

⇒ Conductors allow electrical energy to pass through them.
⇒ Insulators do not allow electrical energy to pass through them.
⇒ Resistance measures how well a material or object conducts electricity.
⇒ Electrical energy transfers around a circuit (as a current) to make components work.
⇒ A circuit will always have a battery (cell) as well as other components.
⇒ When drawing circuit diagrams, simple symbols are used to represent the different components.
⇒ Electrical energy is transferred from the battery to the bulb along the wire.
⇒ Energy is lost at the bulb as light/heat energy.
⇒ The surplus electrical energy from the bulb flows back to the battery.
⇒ A switch connects (closed) or breaks (open) the circuit. This controls the electrical energy to turn the circuit on or off.
⇒ Voltage is a measure of the amount of energy transferred.
⇒ A battery creates a push (voltage) of electrical energy. The bigger the voltage, the more energy is transferred around the circuit.
⇒ Electrical resistance is a force that counteracts electrical flow (current).
⇒ Resistance to electrical flow (energy transfer out of the circuit as heat energy) can result in component failure.
⇒ The voltage of cells used in a battery will affect the brightness of a bulb or volume of a buzzer.
⇒ In a series circuit the current flows the same everywhere. It passes through all components one after another so if there's a break in the circuit, it all stops working.

Year 5/6 Cycle A Science	Unit of Learning: Electricity				
Teaching and Learning Sequence for this Unit.					
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
Can we make a working series circuit? Can we follow a diagram to set up a simple series circuit? Can we problem solve with incorrectly set up circuits?	**How many cells are needed to provide different voltages?** Why do some components require more voltage than others? Can we explore the different voltage outputs of batteries?	**How can we change the amount of energy in a circuit?** How can we change the brightness/loudness of a bulb/buzzer?	**What is electrical resistance?** What happens to the current/voltage as we increase the length of wire?	**What happens to the energy as it flows around a circuit?** What happens to the brightness when we increase the number of bulbs? Why?	**Can we make a circuit to use as part of a wider curriculum project?**
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Electrical energy transfers around a circuit (as a current) to make components work. • In a series circuit the current flows the same everywhere. • It passes through all components one after another so if there's a break in the circuit, it all stops working.	• Voltage is a measure of the amount of energy transferred. • A battery creates a push (voltage) of electrical energy. • The bigger the voltage, the more energy is transferred around the circuit.	• Electrical energy is transferred from the battery to the bulb along the wire. • A battery creates a push (voltage) of electrical energy. • The voltage of cells used in a battery will affect the brightness of a bulb or volume of a buzzer.	• Resistance measures how well a material or object conducts electricity. • Electrical resistance is a force that counteracts electrical flow (current).	• Electrical energy is transferred from the battery to the bulb along the wire. • Energy is lost at the bulb as light/heat energy. • The surplus electrical energy from the bulb flows back to the battery. • Energy transfer out of the circuit as heat energy can result in component failure.	• A circuit will always have a battery (cell) as well as other components. • When drawing circuit diagrams, simple symbols are used to represent the different components.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
*Use knowledge of energy transfer to explain.	*Use knowledge of energy transfer to explain.	*Reason with knowledge and understanding to make a hypothesis.	*Plan a reliable fair test.	*Use knowledge of energy transfer to describe.	*Plan, build and test own circuits.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Series circuit, current, energy, transfer.	Cells, voltage, circuit, electrical energy.	Cells, voltage, affect, energy.	Electrical resistance, counteracts, force.	Energy, transferred, flow, component, surplus.	Circuit, set up, components.

New Learning | Prior Learning

TEACH IT: Animals, including Humans

YEAR 5/6 CYCLE A

KEY OBJECTIVES (STATUTORY)

- 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 and drugs on the way their body's function.
- Describe the ways in which nutrients and water are transported within animals, including humans.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y4: Use simple science words correctly (meaning; apply).
Y5: Begin to use complex science words.
Y6: Use complex science words correctly.

Y4: Use knowledge of animals and humans to describe what and where.
Y5: Use knowledge of animals and humans to describe and begin to explain.
Y6: Use knowledge of animals and humans to describe and explain.

Y4: Annotate diagrams to help describe and explain
Y5: Begin to draw and annotate own diagrams.
Y6: Draw and annotate own diagrams to describe and explain.

DESIGNING EXPERIMENTS

Y4: Predict a trend (relationship prediction).
Y5: Use knowledge and understanding to explain predictions.
Y6: Reason knowledge and understanding to make a hypothesis.

Y4: Suggest a data range and interval for a variable.
Y5: Suggest data range, interval and sufficient readings.
Y6: Plan for repeated readings (>3).

Y4: Design and write a simple ordered method (from plan).
Y5: Design and write a method (controlled variables).
Y6: Write a reliable ordered method (repeats).

VOCABULARY

Circulation (circulatory), heart, atrium (atria), ventricle (ventricles), valve, vessel, artery, vein, capillary, blood, red blood cell, white blood cell, platelets, plasma, lungs, oxygen, oxygenated, deoxygenated, carbon dioxide, nutrients, obesity, exchange, exercise, pulse, recovery time, drugs (various), variable, cause, effect, independent variable, dependent variable, controlled variable, data range, data interval, repetition, reliability, risk, relationship prediction, hypothesis, method, precision, error.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ Food is a balance of nutrients that the body needs.
⇒ There are several essential nutrients that have different functions: water-vital for life; vitamins, minerals and fibre-keep us healthy; carbohydrates-give us energy; proteins-help us to grow; fats-gives us energy, absorbs vitamins and helps nerves and brains. A small amount of fat is an essential part of a healthy diet.
⇒ The human body has different systems to survive.
⇒ The skeleton is a system, which acts as a frame to support and protect the body and allow movement.
⇒ Bones are alive and blood runs through them.
⇒ Muscles are a system. There are three main muscle types in the body: skeletal muscle, cardiac muscle and smooth muscle.
⇒ There is a digestive system, which has different parts to it that help the body to digest food and liquids.
⇒ Each system needs specific nutrients to function effectively.
⇒ There is a circulatory system that is responsible for transporting nutrients, water and oxygen to body cells. It also carries waste such as carbon dioxide, which body cells produce.
⇒ The circulatory system has three main parts: the heart, blood vessels and blood.
⇒ The heart is a muscle that pumps blood around the circulatory system. The blood delivers oxygen to all the body's cells as well as nutrients and water. The blood moves through tubes attached to the heart called arteries and veins which together are called blood vessels. Vessels that carry oxygenated blood away from the heart are called arteries and the ones that carry deoxygenated blood back to the heart are called veins.
⇒ Pulse is the measure of how fast your heart is beating or pumping blood.
⇒ A healthy diet involves eating the right types of nutrients in the right amounts.
⇒ A healthy lifestyle involves a healthy diet as well as regular exercise. Exercise is physical activity that requires effort, raises your heart rate and works your muscles.

Year 5/6 Cycle A Science	Unit of Learning: Animals, including Humans				
Teaching and Learning Sequence for this Unit.					
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What is blood? Why do we have blood?	How does blood travel around our body?	What nutrients do the different systems in our body need and why?	How do the digestive and circulatory systems fit together to absorb and transport nutrients and water through the body?	What makes a healthy lifestyle and what is the impact of this on the body?	What makes an unhealthy lifestyle? What are the effects of poor diet and drugs on the body?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• There is a circulatory system that is responsible for transporting nutrients, water and oxygen to body cells. • It has three main parts: the heart, blood vessels and blood. • Blood is one of the main parts of the circulatory system. • It delivers oxygen to all the body's cells as well as nutrients and water.	• The heart is a muscle that pumps blood around the circulatory system. • The blood moves through tubes attached to the heart called arteries and veins which together are called blood vessels. • Vessels that carry oxygenated blood away from the heart are called arteries; the ones that carry deoxygenated blood back to the heart are veins.	• The human body has different systems to survive. • Skeletal, muscular, digestive and circulatory are some of the systems at work within the human body. • There are several essential nutrients that have different functions. • Each system needs specific nutrients to function properly.	• There is a digestive system, which has different parts to it that help the body to digest food and liquids. • There is a circulatory system that is responsible for transporting nutrients, water and oxygen to body cells. It also carries waste such as carbon dioxide, which body cells produce.	• A healthy diet involves eating the right types of nutrients in the right amounts. • A healthy lifestyle involves a healthy diet as well as regular exercise. • Exercise is physical activity that requires effort, raises your heart rate and works your muscles. • Pulse is the measure of how fast your heart is beating or pumping blood.	• Having an unhealthy lifestyle can be a result of having unhealthy habits. • This is something that you do regularly that is not good for your body or mind. • Eating too many fatty or sugary foods, smoking or taking harmful drugs or not getting enough sleep can all have negative effects on the body.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
*Use complex science words.	*Use knowledge of science to describe and explain.	*Use knowledge of science to describe and explain.	*Use knowledge of science to describe and explain.	*Write an ordered method.	*Use knowledge of science to describe and explain.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Responsible, system, transporting, nutrients.	Circulation, vessels, (de)oxygenated	Skeletal, digest, essential, specific.	Absorb, transport, waste.	Regular, impact, lifestyle, pulse.	Lifestyle, habit, regularly, effect, impact.

New Learning | Prior Learning

TEACH IT: Light

YEAR 5/6 CYCLE A

KEY OBJECTIVES (STATUTORY)

- Recognise that light appears to travel 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 into the eye.
- Explain that we see things because light travels from a light source to our eyes or from light sources to objects and then to our eyes.
- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y4: Use simple science words correctly (meaning; apply).
Y5: Begin to use complex science words.
Y6: Use complex science words correctly.

Y4: Use knowledge of anergy transfer to describe what and where.
Y5: Use knowledge of energy transfer to describe and begin to explain.
Y6: Use knowledge of energy transfer to describe and explain.

Y4: Annotate diagrams to help describe and explain.
Y5: Begin to draw and annotate own diagrams.
Y6: Draw and annotate own diagrams.

MAKING CONCLUSIONS

Y4: Describe simple patterns, trends and relationships in data.
Y5: Describe patterns, trends and relationships.
Y6: Describe changing patterns, trends and relationships.

Y4: Describe trends and begin to use science to explain.
Y5: Use data in conclusions and knowledge of energy transfer to explain.
Y6: Use primary and secondary data in conclusions.

Y4: Suggest sensible improvements to my method.
Y5: Identify strengths, weaknesses and improvements.
Y6: Suggest limitations (data) and practical improvements.

VOCABULARY

Light, source, energy, transfer, reflection (reflected), transmits (transmitted), absorbs (absorbed), shiny, dull, mirror, transparent, translucent, opaque, ray, eye, receptor, shadow, angle, incidence, perpendicular, pattern, data, primary data, secondary data, trend, relationship, conclusion, valid (validity), limitation.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

ENERGY TRANSFER

⇒ Light is needed to see things. Dark is the absence of light.
⇒ Light from the sun can be dangerous. Eyes and skin need to be protected from sunlight.
⇒ Light is a form of energy that enable things to be seen.
⇒ There are natural and artificial sources of light energy.
⇒ Light can be reflected from surfaces (reflected light energy).
⇒ Shadows are formed when light energy is blocked by an object (shadow=absence of transmitted light energy).
⇒ The closer an object is to the source of the light, the larger the shadow it casts.
⇒ Light waves travel out from sources of light in straight lines. These lines are often called rays or beams of light. Rays of light travel from a light source and hit objects around us. The rays of light reflect, or bounce off an object, and then travel into our eyes.
⇒ When light hits an object, it can be reflected, absorbed or transmitted depending on the object's properties.
⇒ As light travels through a material, its intensity (brightness) can change, and this is affected by factors like the material's thickness and how well it transmits light
⇒ The law of reflection states that the angle of incident ray is equal to the angle of the reflected ray so when light hits a mirror, it bounces off at the same angle it hits.
⇒ A shadow forms when an object, blocks transmitted light energy transfer. Shadows can also be elongated or shortened depending on the angle of the light source. A shadow is also larger when the object is closer to the light source. This is because it blocks more of the light energy being transferred.
⇒ A light ray diagram shows the path of light energy transfer.

Year 5/6 Cycle A Science	Unit of Learning: Light		
Teaching and Learning Sequence for this Unit.			
Key Question	**Key Question**	**Key Question**	**Key Question**
How does light travel? How can we use our knowledge of energy transfer to explain how light travels?	**What happens when light hits an object?** How does the light intensity of transmitted light change by increasing sheets of tissue paper? How we use a data logger to measure?	**How can we see around corners?** Can we make a periscope? Can we draw a diagram that helps us to explain how a ray of light travels through a periscope?	**How do shadows form?** How does the angle of the light source affect the size and shape of the shadow? (Use of shadow puppets)
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Light is a form of energy that enable things to be seen. • There are natural and artificial sources of light energy. • Light waves travel out from sources of light in straight lines. These lines are often called rays or beams of light. • Rays of light travel from a light source and hit objects around us. • The rays of light reflect, or bounce off an object, and then travel into our eyes.	• Light can be reflected from surfaces (reflected light energy). • When light hits an object, it can be reflected, absorbed or transmitted depending on the object's properties. • As light travels through a material, its intensity (brightness) can change, and this is affected by factors like the material's thickness and how well it transmits light.	• The law of reflection states that the angle of incident ray is equal to the angle of the reflected ray. • A light ray diagram shows the path of light energy transfer. • When light hits a mirror, it bounces off at the same angle it hits. Light travelling horizontally meets the first mirror in the periscope at 45 degrees, and bounces off at 45 degrees, making 90 degrees altogether so it ends up travelling vertically downwards.	• Shadows are formed when an object, blocks transmitted light energy transfer. • The closer an object is to the source of the light, the larger the shadow it casts. • Shadows can also be elongated or shortened depending on the angle of the light source. A shadow is also larger when the object is closer to the light source. This is because it blocks more of the light energy being transferred.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**
*Use knowledge of energy transfer to explain.	*Describe patterns and make conclusions.	*Draw diagrams to describe and explain.	*Describe patterns and make conclusions.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Form, energy, natural, artificial, source, ray, beam, reflect.	Reflect, absorb, transmit, intensity, properties, affected.	Periscope, ray, diagram, path, transfer, horizontally, vertically.	Transmitted, source, elongated, source, energy transfer.

New Learning | Prior Learning

TEACH IT: Evolution & Inheritance

YEAR 5/6 CYCLE A

KEY OBJECTIVES (STATUTORY)

- 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 adaption may lead to evolution.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y4: Use science knowledge to describe what and where.
Y5: Use science knowledge to describe and begin to explain (why and how).
Y6: Use science models to describe and explain (why, how logical).

Y4: Use simple science words correctly (meaning; apply).
Y5: Use complex science words correctly.
Y6: Use complex science words correctly and fluently.

Y4: Annotate diagrams to help describe and explain.
Y5: Begin to draw and annotate own diagrams.
Y6: Draw and annotate own diagrams to describe and explain.

DATA, TABLES AND GRAPHS

Y4: Construct a simple. table to compare cause and effect.
Y5: Use a frame to construct a complex table of results.
Y6: Construct a complex table to show repeated data.

Y4: Construct bar charts correctly (inc. numerical axis).
Y5: Use a frame to construct a graph and scale axes (with support).
Y6: Construct graphs and scale at least one axis independently.

Y4: Plot coordinates on a graph in the first quadrant.
Y5: Join plotted coordinates with straight lines.
Y6: Plot mean values and draw a trend line for linear data.

VOCABULARY

Inherit (inheritance), variation, asexual, sexual, reproduction, sperm, egg, cell, nucleus, gene, characteristic, trait, environment, parent, offspring, selection (selected), adapt (adaptation), species, evolution, fossil, extinct (extinction), survival, table of results, cause, effect, repeats, bar chart, bar, coordinate, graph, data point, extrapolate, scale, plot, mean, trend line, linear, non-linear.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ Rocks are solid objects that are made up of one or more minerals.
⇒ Rocks can be broken up into smaller pieces.
⇒ Eventually they can be broken up into **particles** which are too small to see.
⇒ Soil is made of very fine rock particles that have mixed with water, air and particles from dead animals and plants.
⇒ Living things trapped in sedimentary rock can form fossils.
⇒ Fossil evidence shows how livings things have changed over time.
⇒ Animals, including humans have offspring that grow into adults.
⇒ Animals grow and change; some animals look like their parents and others do not.
⇒ Humans also grow and change; there are six stages of human maturation: baby, toddler, child, teenager, adult and older adult.
⇒ Living things can produce identical offspring (asexual) but sexual reproduction results in offspring that share inherited features but vary from their parents.
⇒ This variation means that some individuals will have features better suited to a changing environment. These better features will be selected for/by nature and so, individuals who have them are more likely to survive.
⇒ To survive, some species adapt over time.
⇒ Natural selection is the process whereby species adapt to their environment, and it is an engine that drives evolution.

Year 5/6 Science Cycle A	Unit of Learning: Evolution & Inheritance			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
Why are fossils so important? What can they tell us about how living things have changed over time?	**How are we different/the same?** Are all offspring identical to their parents?	**How are living things adapted to their environment?** Which features are adaptive?	**What is meant by evolution?** What are the different theories on evolution?	**How have animals adapted and evolved to suit their environment?** Why are the Galapagos finches a good example of this?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Rocks are solid objects that are made up of one or more minerals. • Living things trapped in sedimentary rock can form fossils. • Fossil evidence shows how livings things have changed over time. • To survive, some species adapt over time	• Animals, including humans have offspring that grow into adults. • Animals grow and change; some animals look like their parents and others do not. • Humans also grow and change; there are six stages of human maturation: baby, toddler, child, teenager, adult and older adult. • Living things can produce identical offspring (asexual) but sexual reproduction results in offspring that share inherited features but vary from their parents.	• Living things can produce identical offspring (asexual) but sexual reproduction results in offspring that share inherited features but vary from their parents. • This variation means that some individuals will have features better suited to a changing environment. These better features will be selected for/by nature and so, individuals who have them are more likely to survive.	• Charles Darwin was a famous naturalist, geologist and biologist who believed that all species of life have descended from a common ancestor. • To survive, some species adapt over time • Natural selection is the process whereby species adapt to their environment, and it is an engine that drives evolution.	• In order to survive, some species adapt over time. • Darwin and the finches of the Galapagos Islands provided a crucial observation that supported his theory of evolution by natural selection. • Darwin noticed that finches on different islands had different beak shapes, each adapted to the specific food available on their island.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Use complex science words correctly.	*Construct charts/graphs.	Use knowledge to explain how and why.	Use complex science words.	*Construct charts/graphs.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Rocks, soil, minerals, particles, sedimentary, fossils, evidence, species, adapt.	Offspring, produce, identical, asexual, sexual, reproduction, inherited, features.	Offspring, produce, identical, asexual, sexual, reproduction, inherited, variation, survive, adapt.	Naturalist, geologist, biologist, natural, selection, species, ancestor, descended, survive, adapt, evolution.	Survive, species, adapt, beaks, food, islands, conditions, survival, fair test, tongs, beads.

Year 5/6

Cycle B

New Learning | Prior Learning

TEACH IT: Earth & Space

Year 5/6 Cycle B

Key Objectives (Statutory)

- 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.

Key Skills Objectives

Explaining Science

Y4: Use and apply simple science words correctly.
Y5: Use complex science words correctly.
Y6: Use complex science words correctly and fluently.

Y4: Begin to use knowledge of energy transfer to describe what and where.
Y5: Use knowledge of energy transfer to describe and explain why and how.
Y6: Use science models to describe and explain (why, how, logical).

Y4: Annotate diagrams to help describe.
Y5: Draw and annotate diagrams.
Y6: Draw and annotate my own diagrams to describe and explain.

Making Conclusions

Y4: Describe simple patterns, trends and relationships.
Y5: Describe patterns, trends and relationships.
Y6: Describe changing patterns, trends and relationships.

Vocabulary

Solar system, sun, star, planet, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, Asteroids, moon, orbit, ellipses, gravity force, temperature, solid, liquid, gas, axis, tilted axis, day, night, month, year, satellite, atmosphere, surface, new moon, full moon, quarter moon, waxing, waning, crescent, gibbous, energy, transfer, Universe, telescope, astronomy, pattern, data, primary data, secondary data, trend, relationship, conclusion, valid (validity).

Key Conceptual Knowledge And Understanding

ENERGY TRANSFER / FORCES

⇒ There are four seasons within a year.
⇒ During the different seasons, the length of our days and nights gets longer and shorter depending on the time of year. This means long days of sunlight during the summer and shorter, darker days during the winter.
⇒ The sun provides heat and light energy.
⇒ The sun is a source of heat and light energy which will transfer to the facing Earth's surface or will reflect off the Moon to the Earth's surface.
⇒ The sun, planets and moon(s) are spherical bodies.
⇒ The Earth and other planets orbit the sun in the solar system; day and night are caused by the Earth's rotation (sun appears to move across the sky). The Earth rotates in front of the Sun on an imaginary line called its *axis*. It takes 24 hours or one day to make a rotation. When parts of the Earth face the Sun, it's daytime. When they are in the shade, it's nighttime.
⇒ The Moon is a non-luminous, reflective object.
⇒ The Moon orbits the Earth. There are different phases of the Moon (new moon to full moon).
⇒ Forces are the things that allow the movement of all objects around us. Gravity is a force.
⇒ The Moon has gravity of its own which pulls the oceans (and us) towards it. Gravity is weaker on the Moon because it's much smaller in size than Earth.

Year 5/6 Cycle B Science	Unit of Learning: Earth & Space			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What is the solar system like? Can we draw, annotate and explain a model of the solar system?	**Why does the sun appear to move across the sky?** Does the amount of energy the sun transfers change during the day?	**Why do we have day and night?** Can we make models to explain day and night?	**What are the phases of the moon?** Can we draw and annotate a diagram to explain the phases of the moon?	**Can we explore the solar system through a research activity?** Moon landings? Space stations? Rockets? Life on Mars?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	
• The solar system is a group of objects, including the Sun, planets, moons, asteroids, and comets, that all orbit the Sun, held together by the Sun's gravity. • Forces are the things that allow the movement of all objects around us. Gravity is a force. • The sun, planets and moon(s) are spherical bodies.	• The sun is a source of heat and light energy which will transfer to the facing Earth's surface or will reflect off the Moon to the Earth's surface. • The amount of energy the sun transfers to Earth changes during the day, with the most energy arriving around midday and less energy arriving at sunrise and sunset. • The sun appears to move across the sky because the Earth is rotating on its axis.	• The Earth and other planets orbit the sun in the solar system; day and night are caused by the Earth's rotation. • The Earth rotates in front of the Sun on an imaginary line called its *axis*. It takes 24 hours or one day to make a rotation. • When parts of the Earth face the Sun, it's daytime. When they are in the shade, it's night time.	• The Moon is a non-luminous, reflective object. • The Moon orbits the Earth. There are different phases of the Moon (new moon to full moon). • The Moon has gravity of its own which pulls the oceans (and us) towards it. Gravity is weaker on the Moon because it's much smaller in size than Earth.	
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
*Annotate diagrams to help describe and explain.	*Describe patterns, trends and relationships.	*Use knowledge of science to describe and explain.	*Annotate diagrams to help describe and explain.	*Use knowledge and understanding to describe/explain.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Asteroid, comet, orbit, gravity, spherical, bodies.	Source, surface, reflect, energy, transfer, rotating.	Orbit, rotation, axis, caused, imaginary.	Luminous, non-luminous, reflective, phases, gravity.	

New Learning | Prior Learning

TEACH IT: Animals, including Humans

Year 5/6 Cycle B

Key Objectives (Statutory)

- Describe the changes as humans develop to old age.

Key Skills Objectives

Explaining Science

Y4: Use and apply simple science words correctly.
Y5: Use complex science words correctly.
Y6: Use complex science words correctly and fluently.

Y4: Begin to use knowledge of science to describe what and where
Y5: Use knowledge of science to describe and explain why and how.
Y6: Use science models to describe and explain (why, how, logical).

Y4: Annotate diagrams to help describe.
Y5: Draw and annotate diagrams.
Y6: Draw and annotate my own diagrams to describe and explain.

Data, Tables and Graphs

Y4: Measure and convert standards units.
Y5: Measure and convert standard units.
Y6: Measure/calculate with standard units (inc. area and volume).

Y4: Construct a simple table to compare cause and effect.
Y5: Use a frame to construct a complex table of results.
Y6: Construct a complex table to show repeated data.

Y4: Construct bar charts correctly.
Y5: Construct charts and graphs.
Y6: Construct graphs and can scale at least one axis independently.

Vocabulary

Baby, toddler, child, adolescent, adult, geriatric, growth, puberty, fertilisation, gestation, birth, egg, sperm, gamete, embryo, foetus, periods, pubic hair, testicle, scrotum, penis, vagina, vulva, cervix, uterus, ovary, erection, ejaculation.

Key Conceptual Knowledge And Understanding

Animals, Including Humans: Kingdoms

⇒ Animals grow and change; some animals look like their parents and others do not.
⇒ Animals, including humans have offspring that grow into adults.
⇒ Humans also grow and change; there are six stages of human maturation: baby, toddler, child, teenager, adult and older adult.
⇒ Gestation is the growth and development of a baby before it is born. It follows the pattern of fertilisation, growth in the womb and birth.
⇒ The womb is the organ in a female that the unborn baby grows and develops in.
⇒ An embryo is the name for an unborn human in the earliest stages of growth.
⇒ A foetus is the name for a baby when it is 8 weeks old in the womb.
⇒ The human gestation period lasts about 40 weeks.
⇒ Adolescence is when children start changing into an adult; puberty is the start of adolescence.
⇒ Girls start to develop earlier than boys at around 11 years old.
⇒ Boys start to change around 12-13 years old.
⇒ Girls and boys start to develop pubic hair and underarm hair, and girls start to develop breasts.
⇒ Girls and boys can develop spots as their skins adjusts.
⇒ Gestation periods of mammals differ, as do the average number of offspring and the lifespan of the mammal.
⇒ Old age is the last period of human life.
⇒ Old age in adulthood is believed to begin at about 65 years.
⇒ During old age, hair can become grey, and hearing and vision can deteriorate.
⇒ During old age, bones can shrink in size, and muscles generally lose strength and flexibility.

Year 5/6 Cycle B Science	Unit of Learning: Animals, including Humans		
Teaching and Learning Sequence for this Unit.			
Key Question	**Key Question**	**Key Question**	**Key Question**
What is the human timeline? What are the different stages? When do they begin?	**What happens to our bodies as we get older?** What happens to bone length as we get older?	**How do we change into adults?** What happens during puberty?	**How does human and animal lifespan compare?** Do all animals follow the same pattern of gestation?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Humans grow and change; there are six stages of human maturation: baby, toddler, child, teenager, adult and older adult. • Gestation is the growth and development of a baby before it is born. It follows the pattern of fertilisation, growth in the womb and birth. • The womb is the organ in a female that the unborn baby grows and develops in. • An embryo is the name for an unborn human in the earliest stages of growth. • A foetus is the name for a baby when it is 8 weeks old in the womb. • The human gestation period lasts about 40 weeks.	• Old age is the last period of human life. • Old age in adulthood is believed to begin at about 65 years. • During old age, hair can become grey, and hearing and vision can deteriorate. • During old age, bones can shrink in size, and muscles generally lose strength and flexibility.	• Adolescence is when children start changing into an adult; puberty is the start of adolescence. • Girls start to develop earlier than boys at around 11 years old. • Boys start to change around 12-13 years old. • Girls and boys start to develop pubic hair and underarm hair, and girls start to develop breasts. • Girls and boys can develop spots as their skins adjusts.	• Gestation periods of mammals differ, as do the average number of offspring and the lifespan of the mammal.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**
*Annotate diagrams to help describe and explain.	*Construct complex tables.	*Use complex science words.	*Annotate diagrams to hep describe and explain.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Maturation, gestation, fertilisation, embryo, womb, foetus.	Bones, length, deteriorate, shrink, flexibility.	Adolescence, puberty, pubic, adjusts, develop.	Gestation, lifespan, offspring, average, mammal.

New Learning | Prior Learning

TEACH IT: Living Things & Their Habitats

YEAR 5/6 CYCLE B

KEY OBJECTIVES (STATUTORY)

- Describe the differences in the lifecycles of a mammal, an amphibian, an insect and a bird.
- Describe the process of reproduction in some plants and animals.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y4: Use and apply simple science words correctly.
Y5: Use complex science words correctly.
Y6: Use complex science words correctly and fluently.

Y4: Use knowledge of living things to describe what and where.
Y5: Use knowledge of living things to describe and explain why and how.
Y6: Use science models to describe and explain (why, how, logical).

Y4: Annotate diagrams to help describe.
Y5: Draw and annotate diagrams.
Y6: Draw and annotate my own diagrams to describe and explain.

CLASSIFICATION

Y4: Create appropriate groups for sorting (create criteria).
Y5: Group and sub-group by easy observation (create criteria).
Y6: Group and sub-group by fine observation (create criteria).

DESIGNING EXPERIMENTS

Y4: Predict a trend (relationship prediction).
Y5: Use knowledge and understanding to explain a prediction (relationship prediction).
Y6: Reason K&U to make a hypothesis (relationship).

Y4: Plan a fair teat by selecting a variable to change and measure.
Y5: Plan a fair test and ensure controlled variables are kept the same.
Y6: Plan a reliable fair test (use of variable terminology).

Y4: Design and write a simple ordered method (from plan).
Y5: Design and write an ordered method (controls variables).
Y6: Design and write an ordered and reliable method.

VOCABULARY

Sexual, asexual, growth, metamorphosis, puberty, reproduction, fertilisation, gamete, egg, sperm, embryo, foetus, larva, pupa (chrysalis), testes, uterus, gestation, birth, petals, sepals, carpel, stigma, ovary, anther, stamen, pollen, pollination, dispersal, vegetative, bulb, runner, tuber, rhizome, corm, stem, root, variation, clone, independent variable, dependent variable, controlled variable, data range, data interval, repetition, reliability, risk, relationship prediction, hypothesis, method, scale.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ Mammals are warm-blooded, have skin, hair or fur, give birth to live young and breathe air; humans are mammals.
⇒ Birds are warm-blooded, have skin, feathers, beaks and wings, lay eggs and breathe air.
⇒ Amphibians are cold-blooded, have slimy skin, lay soft eggs and most can breathe underwater and on land.
⇒ Reptiles are cold-blooded, have scaly skin, lay harder eggs and breathe air.
⇒ Fish are cold-blooded, have fins and scales, lay soft eggs in water and breathe underwater.
⇒ Living things can be divided or sorted into different groups using a classification key. This is a series of questions to identify a living thing and can unlock the identity of it.
⇒ Animals can be divided into vertebrates and invertebrates and plants can be divided into flowering or non-flowering, to classify them.
⇒ Flowering plants reproduce using flowers to make seeds; non-flowering plants reproduce using spores and seed cones.
⇒ Spores are minute organisms that do not need fertilisation to grow into a new individual.
⇒ A community of animals, plants and microorganisms, together with their habitat is called an ecosystem.
⇒ A lifecycle is the different stages of life for all living things, including humans.
⇒ There are normally four major events in the lifecycle of animals: birth-growth-reproduction and death.
⇒ There are similarities and differences between the lifecycles of mammals, amphibians, birds and insects.
⇒ Insects and amphibians go through a transformational change called metamorphosis.
⇒ Reproduction in living things is varied. Some reproduce asexually, whilst others reproduce sexually. Some plants and a few animals can reproduce asexually and sexually.
⇒ Sexual reproduction produces variation within a species, due to the combination of male and female cells, whereas asexual reproduction makes an identical copy of the animal or plant.
⇒ Only very few animals reproduce sexually and asexually. Many plants use asexual reproduction as an efficient and fast way to populate.

Year 5/6 Cycle B Science	Unit of Learning: Living Things & Their Habitats			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What is the difference between a mammal and an amphibian? Can we list and match what is similar? Can we notice and deduce what is different?	**What is the difference between an insect and a bird?** Can we list and match what is similar? Can we notice and deduce what is different?	**What is similar/different between the lifecycles of a mammal, an insect, an amphibian and a bird?**	**How do living things reproduce?** What are the differences between asexual and sexual reproduction?	**Can we investigate reproduction in plants?** Does wind speed affect how far pollen is blown?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Mammals are warm-blooded, have skin, hair or fur, give birth to live young and breathe air; humans are mammals. • Amphibians are cold-blooded, have slimy skin, lay soft eggs and most can breathe underwater and on land. • Living things can be divided or sorted into different groups using a classification key.	• Birds are warm-blooded, have skin, feathers, beaks and wings, lay eggs and breathe air. • Animals can be divided into vertebrates and invertebrates. • An insect is an invertebrate animal that lays eggs, has antennae, six legs and a body that is divided into 3 segments.	• A lifecycle is the different stages of life for all living things, including humans. • There are normally four major events in the lifecycle of animals: birth-growth-reproduction and death. • There are similarities and differences between the lifecycles of mammals, amphibians, birds and insects. • Insects and amphibians go through a transformational change called metamorphosis.	• Reproduction in living things is varied. Some reproduce asexually, whilst others reproduce sexually. Some plants and a few animals can reproduce asexually and sexually. • Sexual reproduction produces variation within a species, due to the combination of male and female cells, whereas asexual reproduction makes an identical copy of the animal or plant.	• Many plants use asexual reproduction as an efficient and fast way to populate.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
*Group & sub-group by fine observations.	*Group & sub-group by fine observations.	*Categorise, compare, contrast and deduce to draw conclusions.	*Use knowledge of science to describe/explain.	*Plan a fair test *Write an ordered method.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Mammal, warm-blooded, classification, amphibians.	Vertebrates, invertebrates, antennae, segments.	Transformation, metamorphosis.	Varied, species, combination, identical.	Independent/dependent variable, method.

New Learning | Prior Learning

TEACH IT: Forces

YEAR 5/6 CYCLE B

KEY OBJECTIVES (STATUTORY)

- 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.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y4: Use and apply simple science words correctly.
Y5: Use complex science words correctly.
Y6: Use complex science words correctly and fluently.

Y4: Use knowledge of forces to describe what and where.
Y5: Use knowledge of forces to describe and explain why and how.
Y6: Use knowledge of forces to describe and explain (why, how, logical).

Y4: Annotate diagrams to help describe.
Y5: Draw and annotate diagrams.se and apply simple science words correctly.
Y6: Draw and annotate my own diagrams to describe and explain.

DATA, TABLES AND GRAPHS

Y4: Construct a simple table of results.
Y5: Use a frame to construct a complex table of results.
Y6: Construct a complex table to show repeated data.

Y4: Construct a bar chart correctly.
Y5: Use a frame to construct a graph and scale axes.
Y6: Construct graphs and can scale at least one axis independently

Y4: Plot co-ordinates on a graph.
Y5: Join plotted co-ordinates with straight lines.
Y6: Plot mean values and draw a trend line for linear data.

VOCABULARY

Force, force arrow, contact force, non-contact force, push force, pull force, twist force, friction force, up thrust force, reaction force, gravity force, air resistance force, water resistance force, particle, solid, liquid, gas, balanced, unbalanced, resultant force, force meter, Newton (N), mass, weight, machine, lever (type 1,2 & 3), pivot, fulcrum, effort, load, pulley, mechanical advantage, force multiplier, gear, cog, turning force, speed, acceleration, table of results, cause, effect, repeats, bar chart, bar, coordinate, graph, data point, extrapolate, scale, plot, mean, trend line.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ There are different types of forces: a push force, a pull force, a gravitational force (an air resistance force, water resistance force and friction force-Y5).
⇒ Some forces need contact (contact forces) between two objects and some forces act at a distance (non-contact forces).
⇒ The type of force should be identified using a label; the size and direction of a force can be shown using an arrow. The length of the arrow determines the size of the force; if arrows are of equal length, then the forces will be equal in size. The direction of an arrow determines in which direction the force is acting.
⇒ When forces are balanced, they cancel each other out, resulting in no change in motion for the object they are acting on. Unbalanced forces do not cancel each other out, and result in a change in motion for the object they are acting on.
⇒ Magnets attract and repel each other. Magnets have two poles which coincide with the Earth's poles.
⇒ Materials can be grouped together based upon whether they are attracted to a magnet (magnetic) or not.
⇒ Opposing forces can be in balance or unbalanced.
⇒ Unsupported objects fall towards Earth because of gravitational force acting between earth and the falling object.
⇒ Air resistance force (gas) water resistance force (liquid) and friction force (solid) act between moving surfaces.
⇒ Levers, pulleys and gears allow a smaller force to have a greater effect.

Year 5/6 Cycle B Science	Unit of Learning: Forces				
Teaching and Learning Sequence for this Unit.					
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What do we already know about contact forces? Can we explore push/pulls of different weights using a force meter?	**What is the effect of friction?** How can we move a box more easily? What can we use (wheels, rollers, lubricants)? Can we describe the effect of friction?	**What is the effect of air resistance?** How do air particles make it difficult for objects to move through air? How does the size and shape of the object affect this?	**What do already know about non-contact forces?** How can we stop an egg hitting the ground when we drop it from a height? (Use of elasticated material) How could we describe the forces at work?	**What is upthrust?** What happens when you try to push a balloon underwater? What shape of boat is the most buoyant?	**What is a machine?** What is a lever and what does it do? How does the length of the lever affect the force needed to lift a load?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• There are different types of forces: a push force, a pull force, a gravitational force, an air resistance force, water resistance force and friction force. • Some forces need contact (contact forces) between two objects. • Opposing forces can be in balance or unbalanced.	• Friction force acts between moving surfaces. • Friction works in the direction opposite to the direction in which the object is moving, or trying to move. • Friction always slows a moving object down. • Friction can be reduced.	• Air resistance force acts between moving surfaces-air and another material. • It is a force that slows down objects moving through the air, acting in the opposite direction to the motion. • Air particles hit the surface of an object and make it more difficult for it to move through the air.	• Some forces act at a distance (non-contact forces). • Unsupported objects fall towards Earth because of gravitational force acting between earth and the falling object. • The descent speed can be slowed down.	• Water resistance is a force that acts in the opposite direction to motion when an object is moving through water. • Upthrust (or buoyancy) is the force that causes objects to float.	• A machine is a device that makes work easier by using force and motion to do a task, like lifting or moving things. • A lever is a simple mechanism that uses a bar to pivot around a fixed point called a fulcrum.
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
*Construct a complex table.	*Use knowledge of forces to describe and explain.	*Use knowledge of forces to describe and explain.	*Construct a graph.	*Construct a graph.	*Construct a graph.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Gravity, resistance, contact.	Surfaces, opposite, reduce.	Particle, resistance, surface.	Non-contact, unsupported, descent	Motion, buoyancy, up thrust.	Device, motion, mechanism, fulcrum.

New Learning | Prior Learning

TEACH IT: Living Things and Their Habitats

YEAR 5/6 CYCLE B

KEY OBJECTIVES (STATUTORY)

- 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.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

Y4: Show a developing knowledge and understanding of science ideas and concepts.
Y5: Use clear knowledge and understanding of science ideas and concepts.
Y6: Show secure knowledge and understanding of science (facts and concepts).

Y4: Use simple science words correctly (meaning; apply).
Y5: Use complex science words correctly.
Y6: Use complex science words correctly and fluently.

Y4: Annotate diagrams to help describe and explain.
Y5: Begin to draw and annotate own diagrams.
Y6: Draw and annotate own diagrams to describe and explain.

DATA, TABLES AND GRAPHS

Y4: Construct a simple. table to compare cause and effect.
Y5: Construct spider and use number keys
Y6: Construct both spider and number keys.

Y4: Construct a simple. table to compare cause and effect.
Y5: Group and sub-group by easy observation (create criteria).
Y6: Group and sub-group by fine observations.

VOCABULARY

Classification, taxonomy, characteristic, diversity, variation, Kingdom, phylum, class, order, family, genus, species, binomial, animal, plant, fungi, Protista (single-celled), Monera (bacteria), virus, vertebrate, invertebrate, agar, sort, group, re-group, classify, criteria, spider key, number key.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

⇒ Living things can be divided or sorted into different groups using a classification key.
⇒ A classification key is a series of questions used to identify a living thing and can unlock the identity of it.
⇒ There are 5 major kingdoms-animal, plant, fungi, algae, slime and mould and bacteria.
⇒ The animal kingdom can be divided into vertebrates and invertebrates and the plant kingdom can be divided into flowering or non-flowering, to classify them.
⇒ The taxonomy system was created by Carl Linnaeus in 1737 to organise living things.
⇒ Linnaeus' classification looked at natural things to decide if they were related. It includes 7 levels from largest to smallest: kingdom, phylum, class, order, family, genus and species.
⇒ Vertebrates all have a backbone and can be grouped into 5 classes: amphibians, birds, fish, mammals and reptiles.
⇒ Invertebrates have no backbone and occupy around 95% of the animal species and can be grouped into 4 classes: Annelida, Mollusc, Arachnida and Insects.
⇒ Bacteria, algae, slime and mould are all micro-organisms (incredibly small living things).
⇒ There are helpful and harmful bacteria. Helpful bacteria live in your gut and help break down food and fight the harmful bacteria. Harmful bacteria is transmitted in food and can cause illness.
⇒ Mould is a fungus that can grow on food and can make it unsafe to eat but when planned and prepared properly, mould can safely add to the flavour of food (blue cheese).
⇒ Viruses are types of micro-organism but are not a true living thing: they can only live and grow in the cells of animals, plants and bacteria. Viruses only cause harm.

Year 5/6 Cycle B Science	Unit of Learning: Living Things and Their Habitats			
Teaching and Learning Sequence for this Unit.				
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
How are animals and plants classified? Who was the scientist Carl Linnaeus and what did he do?	How do we classify vertebrates? Can we categorise, describe, sort and classify vertebrates?	How do we classify invertebrates? Can we categorise, describe, sort and classify invertebrates?	What are micro-organisms? Where can we find microbes? Can we group them?	What is mould? Which conditions are best for mould to grow?
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Living things can be divided or sorted into different groups using a classification key. • There are 5 major kingdoms-animal, plant, fungi, algae, slime and mould and bacteria. • The taxonomy system was created by Carl Linnaeus in 1737 to organise living things. • Linnaeus' classification looked at natural things to decide if they were related. It includes 7 levels from largest to smallest: kingdom, phylum, class, order, family, genus and species.	• Vertebrates all have a backbone and can be grouped into 5 classes: amphibians, birds, fish, mammals and reptiles.	• Invertebrates have no backbone and occupy around 95% of the animal species and can be grouped into 4 classes: Annelida, Mollusc, Arachnida and Insects.	• Bacteria, algae, slime and mould are all micro-organisms (incredibly small living things). • There are helpful and harmful bacteria. Helpful bacteria live in your gut and help break down food and fight the harmful bacteria. Harmful bacteria is transmitted in food and can cause illness. • Viruses are types of micro-organism but are not a true living thing: they can only live and grow in the cells of animals, plants and bacteria. Viruses only cause harm.	• Mould is a fungus that can grow on food and can make it unsafe to eat but when planned and prepared properly, mould can safely add to the flavour of food (blue cheese).
Key Skill	**Key Skill**	**Key Skill**	**Key Skill**	**Key Skill**
Use complex words science correctly.	Construct spider and number keys?	Construct spider and number keys?	Group and sub-group by fine observations.	Draw diagrams to describe and explain.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**	**Key Vocabulary**
Kingdom, system, related, taxonomy.	Vertebrate, classes, mammal, amphibian.	Invertebrate, occupy, species.	Bacteria, micro-organism transmitted, harmful.	Mould, fungus, conditions.

New Learning | Prior Learning

APPLY IT: Working Scientifically

YEAR 5/6

CHILDREN SHOULD BE SUPPORTED TO DEVELOP THEIR UNDERSTANDING OF SCIENTIFIC IDEAS BY USING DIFFERENT TYPES OF SCIENTIFIC ENQUIRY THROUGHOUT ALL TEACHING.

WORKING SCIENTIFICALLY

During Years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programmes of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments.

POSSIBLE SCIENTIFIC INVESTIGATIONS:

CYCLE A

Properties and Changes of Materials:

- Does it take more time for an ice cube to melt or for water to freeze and make an ice cube? (same size and shape).
- How could we separate different size materials (sieving, filtering, evaporation)?
- Which materials would be the most effective for different purposes e.g. for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?'
- What are the best materials to make a switch in a circuit.
- What changes take place when a material is exposed to heat (burning different materials or baking bread or cakes)?

Electricity

- How does electricity work?
- What are the effects and consequences of changing circuit components and batteries?

Animals, including humans:

- Do fruit juices have less sugar than a can of fizzy drink?
- Does our heart rate only increase when we exercise?

Light

- What colour is light made of?
- How does light help us to see objects?
- How does reflection help us to see objects?
- What surfaces make the best reflectors?
- Why do we see objects as a particular colour?
- What happens to the appearance of an object when placed in water?

Evolution and Inheritance

- How has life on earth changed over time?
- What is DNA and what does it do?
- Are all offspring identical to their parents?
- How have living things adapted to survive in extreme conditions? (cactuses, penguins and camels)
- What are the advantages and disadvantages of specific adaptations? (two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers).

CYCLE B

Earth and Space:

- Does the moon change shape?
- Does the sun move across the sky?
- What is it like at the same time of the day at different places on the Earth? (internet links and direct communication)
- How have structures such as Stonehenge been used as astronomical clocks?

Animals, including Humans:

- How do the gestation periods of other animals compare to humans?

Living Things and Their Habitats:

- How can we grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs?
- What changes occur in animals over a period of time (for example, by hatching and rearing chicks)?
- Do all animals reproduce and grow in the same way?
- What is the same and what is different about the life cycles of plants and animals in their local environment and how does this compare with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times)?

Forces:

- What can change the effect of friction?
- What does air resistance feel like?
- How does increasing the speed affect air resistance?
- What happens if you reduce the surface area?
- What causes resistance in water? (testing boats of different shapes).

Living things and habitats:

- What are the similarities and differences between vertebrates?
- What are the similarities and differences between invertebrates?
- What are the best conditions for mould to grow?