MARTON MANOR
PRIMARY SCHOOL

YEAR 2

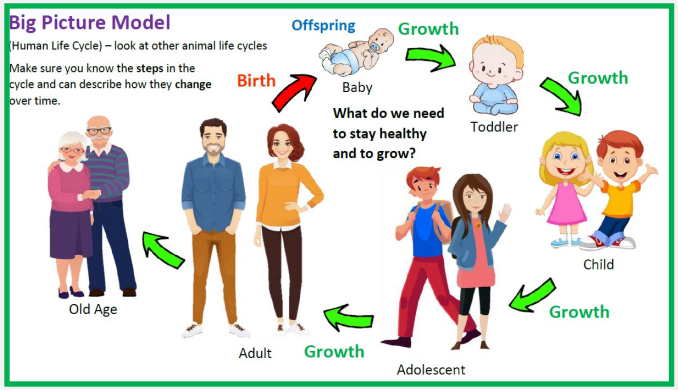
SCIENCE CURRICULUM

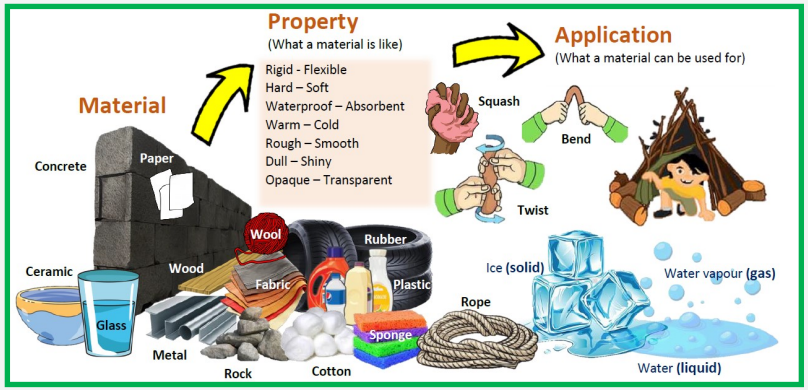
KNOW IT: YEAR 2

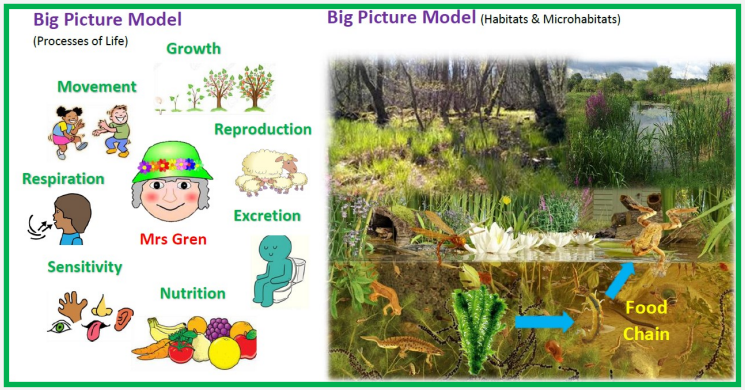
TOPICS OF STUDY FOR YEAR 2

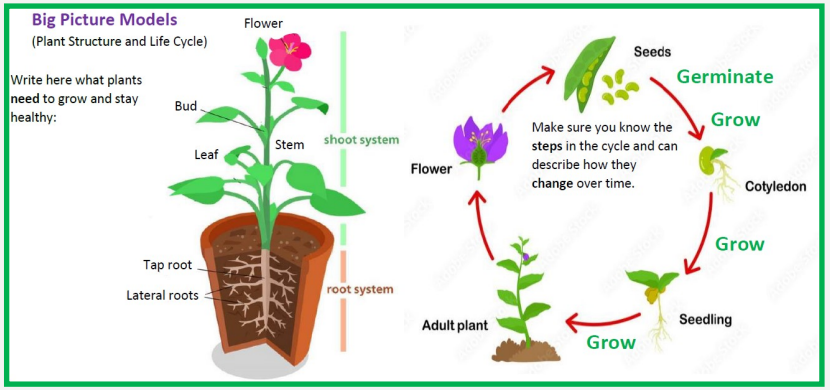
ANIMALS: KINGDOMS **USES OF EVERYDAY MATERIALS** PARTICLES **LIVING THINGS & HABITATS** KINGDOMS **PLANTS:** KINGDOMS

CONCEPTUAL MODELS FOR YEAR 2









DISCIPLINARY KNOWLEDGE AND SCIENTIFIC ENQUIRY:

How we 'work' and 'think' like a Scientist.

YEAR 2

EXPLAINING SCIENCE

- 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

- 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

- 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 AND GRAPHS

- 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

- 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).

New Learning | Prior Learning

TEACH IT: Uses of Everyday Materials

Year 2

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

⇒ Group by difference or similarity.
⇒ Group by difference, similarity or change.

⇒ Use senses to identify properties of materials-Reception.
⇒ Link properties of materials to an application-Year 1.

Designing Experiments

⇒ Use some equipment correctly with help.
⇒ Use a range of equipment correctly.

⇒ Notice risk and list some common dangers.
⇒ Notice risk and know common dangers.

⇒ Follow short demonstrations and/or spoken and picture instructions.
⇒ 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.

Prior Learning

Reception: Understanding the World; The Natural World: Learn about common materials in the immediate environment. Begin to describe properties of these materials using basic vocabulary. Observe changes to materials through heating, cooling, squashing, stretching etc.

Y1 Everyday Materials: Objects are made of materials; different objects are made from different materials. Awareness of common materials and their simple physical properties. Compare and group materials.

Key Conceptual Knowledge And Understanding

Uses Of Everyday Materials: Particles

⇒ 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.

PRIOR LEARNING LINKS

ELG for Understanding the World; The Natural World: Learn about common materials in the immediate environment. Begin to describe properties of these materials using basic vocabulary. Observe changes to materials through heating, cooling, squashing, stretching etc.

Y1 Everyday Materials: Objects are made of materials; different objects are made from different materials. Awareness of common materials and their simple physical properties. Compare and group materials.

Year 2 Science

Unit of Learning:

Uses of Everyday Materials

FUTURE LEARNING LINKS

Y3 Rocks: Compare and group together different kinds of rocks; understand rock and fossil formation. Learn about soil.
Y4 States of Matter: Learn about other states of matter as well as solids e.g. liquids and gases.
Y5 Properties and Changes of materials: More complex properties such as, solubility, transparency, conductivity.

Teaching and Learning Sequence for this Unit.

What are things made from?
What can we remember about the most common materials?

Key Skill:
Link properties to application.

Do different materials have different properties?
Can we test materials to learn more about their properties?

Key Skill:
Use a range of equipment correctly.

What materials are these objects made from and why?

What else could they or couldn't they be made from? Why?
Key Skill:
Link properties to application.

Can we change the shape of solid objects by squashing, bending, twisting and stretching?

Key Skill:
Group by difference, similarity or change.

Why can some solid objects be manipulated more than others?
Which properties prevent you from changing an object?
Key Skill:
Link properties to application.

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 Skill: Follow instructions.

Key Learning Objectives:

- 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 materials can be changed by squashing, bending, twisting and stretching.

Key Conceptual Knowledge and Understanding - 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.
⇒ 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.

New Learning | Prior Learning

TEACH IT: Animals, including Humans YEAR 2

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

⇒ Use and remember science words in an activity.
⇒ Use and remember science words over time.

⇒ Use science to describe what is happening.
⇒ Use science to describe and recall what has been seen.

⇒ Add science words/labels to diagrams
⇒ Add science labels and information to diagrams (with support).

DATA, TABLES AND GRAPHS

⇒ Measure numbers with a number track.
⇒ Measure labelled divisions on a number line.

⇒ Use a simple table of results (words and numbers).
⇒ Use a simple table of results (numbers) and tally numbers.

⇒ Use a frame to add to pictograms and block charts.
⇒ 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

PRIOR LEARNING

Y1 Animals, including Humans: There are different parts to the body which all have a function and some are associated with a sense. There are different types of animals and these groups of animals have key characteristics. Animals feed in different ways and can be classified as carnivores, herbivores or omnivores accordingly.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

ANIMALS, INCLUDING HUMANS: KINGDOMS

⇒ 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 category: 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.

PRIOR LEARNING LINKS

Y1 Animals including Humans: There are different parts to the body which all have a function and some are associated with a sense. There are different types of animals and these groups of animals have key characteristics. Animals feed in different ways and can be classified as carnivores, herbivores or omnivores accordingly.

Year 2 Science

Unit of Learning:

Animals, including Humans

FUTURE LEARNING LINKS

Y3 Animals including Humans: Effect of different nutrients on the body. The main food groups and what constitutes a balanced diet (food pyramid). Skeletal systems including the bones and their functions. Animal skeleton types. The position of the muscles, their functions, different types of muscles and how they enable movement.

Teaching and Learning Sequence for this Unit.

What is an animal?
What can we remember about the different groups of animals and their characteristics? What do all animals do? (MRS GREN)
Key Skill:
Remember relevant science facts.

What happens to our bodies as we grow?
What grows as we get older?
Key Skill:
Use a simple table by recording in numbers.

Do other animals grow in the same way as us?
What are the similarities and differences?
Key Skill:
Remember words and facts about science.

What do all animals need to stay alive?
Why is water, air and food essential for survival?
Key Skill:
Remembering words/facts about science.

Why do we eat different types of food?
How many days this week have we eaten our 5 A-Day?
Key Skill:
Construct block charts.

Why do humans need to exercise
What happens to our body when we exercise? What types of exercise have we done this week?
Key Skill:
Use a simple tally table.

What is hygiene and why is it important?
Why is it important to brush our teeth and wash our bodies?
Key Skill:
Remember words and facts about science.

Key Learning Objectives:

- 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 Conceptual Knowledge and Understanding - Particles

⇒ Humans are part of the animal kingdom and share the same characteristics.
⇒ 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 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.

New Learning | Prior Learning

TEACH IT: Living Things & Habitats

YEAR 2

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

⇒ Use and remember science words in an activity.
⇒ Use and remember science words over time.

⇒ Remember some simple facts about science.
⇒ Remember simple science facts with confidence.

⇒ Add science words/labels to diagrams
⇒ Add science labels and information to diagrams (with support).

CLASSIFICATION

⇒ Group by difference or similarity;
⇒ Group by difference, similarity or change.

⇒ Sort by using simple yes/no statements.
⇒ 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.

PRIOR LEARNING

Reception: Understanding the World; The Natural World: Learn about different plants and animals and where they can be found or live. Learn about basic lifecycles such as, chick or frog. Learn about different animals that live in hot and cold climates and the differences between them.

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. rockpools.
⇒ 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.**

PRIOR LEARNING LINKS

Reception: Understanding the World; The Natural World: Learn about different plants and animals and where they can be found or live. Learn about basic lifecycles such as, chick or frog. Learn about different animals that live in hot and cold climates and the differences between them.

Year 2: Science

Unit of Learning:

Living Things & Habitats

FUTURE LEARNING LINKS

Y4 Living Things & Habitats: Learn more about animal and plant classification. Learn the different ways that plants reproduce. Explore local woodland habitat and learn about ecosystems and what makes them healthy-links to Amazon Rainforest Geography topic.

Teaching and Learning Sequence for this Unit.

What is alive and what is not?

Can we identify living, dead and non-living things?

Key Skill:
Group using differences, similarities and changes.

What do all living things have in common?

Can we identify the 7 features of living things? (MRS GREN).

Key Skill:
Use and remember science words over time.

What is a habitat?

Where do different plants and animals live?
Why are they suited to this particular environment?

Key Skill:
Use and remember science words over time.

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?
Key Skill:
Group using differences, similarities & changes.

What are food chains?

How are they connected?

Are humans part of a food chain?

Key Skill:
Add labels and information to diagrams.

Why do plants and animals need each other?

What can happen if part of a food chain is taken away?

Key Skill:
Remember simple science facts with confidence.

Key Learning Objectives:

- 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 Conceptual Knowledge and Understanding-

⇒ A living thing has the following features: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition.
⇒ Something that was once alive used to be able to do these things; something that has never been alive has not.
⇒ 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. rockpools.
⇒ 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 from food. A food chain shows how energy is passed between 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.**

New Learning | Prior Learning

TEACH IT: Plants

YEAR 2

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

⇒ Suggest what might happen (with help)
⇒ Suggest what might happen in my investigation.

⇒ Suggest an idea to test from observations.

⇒ Follow short demonstrations and/or spoken and picture instructions.;
⇒ Follow short spoken and written instructions.

Analysis & Evaluation

⇒ Recognise and describe number patterns.
⇒ Describe simple patterns in data and charts.

⇒ Describe changes that are happening.
⇒ Describe changes that have happened.

⇒ Explore different ways to do things through play.
⇒ 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

Prior Learning

EYFS Foundations for Science-Understanding the World-The Natural World. 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.

Y1 Plants: Learn about different types of common wild and garden plants. Learn about tress and their different parts. Learn that there are two types of trees: evergreen and deciduous -link back to work on seasonal changes in Y1.

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.
⇒ 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.

PRIOR LEARNING LINKS

EYFS Foundations for Science: 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.

Y1 Plants: Learn about different types of common wild and garden plants. Learn about tress and their different parts. Learn that there are two types of trees: evergreen and deciduous-link back to work on seasonal changes in Y1.

Year 2 Science

Unit of Learning:

Plants

Teaching and Learning Sequence for this Unit.

FUTURE LEARNING LINKS

Y3 Plants: Learn more about the different parts of a flowering plant and their functions. Learn how plants make food through the process of photosynthesis. Learn about plant reproduction including the process of pollination and seed dispersal.

What is a plant?

What are the different parts of a plant?

Key Skill:
Use a remember science words over time.

How do plants grow?

How do seeds germinate?

How do bulbs sprout?

Key Skill:

Follow short spoken and written instructions.

What do plants need to grow and stay healthy?

Can a seed germinate in the dark?

Can a plant grow in the dark?

Key Skill:
Suggest an idea to test from observations.

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?

Key Skill:
Follow instructions time.

What happens when plants do not get all of the things they need?

What do we need to do to look after plants?

Key Skill:
Describe patterns in data and charts.

Key Learning Objectives:

- 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 Conceptual Knowledge and Understanding-BIG PICTURE: PLANTS

⇒ 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.

New Learning | Prior Learning

APPLY IT: Working Scientifically

YEAR 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:

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?

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?

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?

Plants:

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