Year 3

Science Curriculum

KNOW IT!

TEACH IT!

APPLY IT!

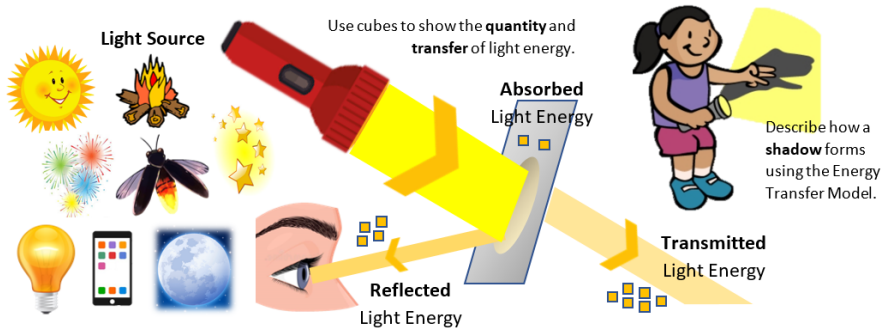
KNOW IT: YEAR 3

TOPICS OF STUDY FOR YEAR 3

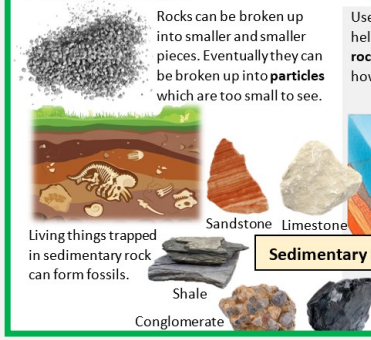
LIGHT: ENERGY TRANSFER **ROCKS:** PARTICLES **ANIMALS:** KINGDOMS **FORCES**: FORCE **PLANTS:** KINGDOMS

CONCEPTUAL MODELS FOR YEAR 3

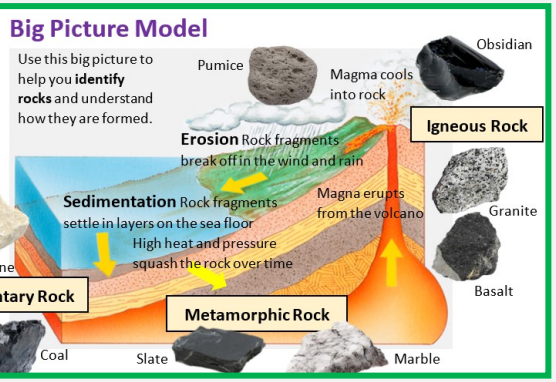
Energy Transfer Model



Particle Model



Big Picture Model

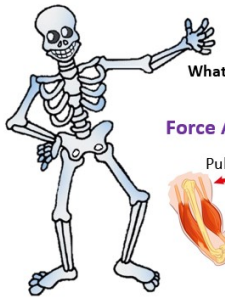


Big Picture Model (Balanced Diet)

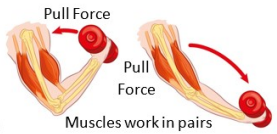
Make sure you can describe a **balanced diet** and can describe the **transfer of energy** from different foods.

Big Picture Model (Skeleton & Muscles)

What jobs do our bones do?



Force Arrow Model

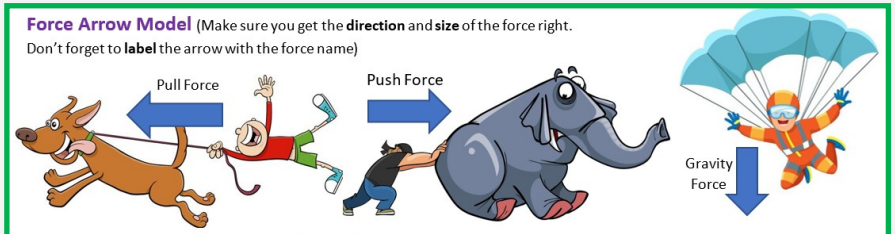


Muscles work in pairs to cause movement

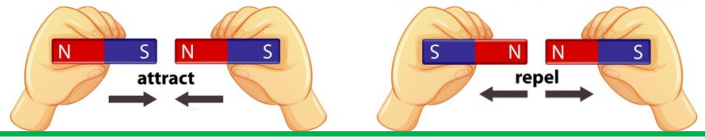
Make sure you can describe **jobs of bones** and can explain how **muscles** move bones using **forces**.

Force Arrow Model

(Make sure you get the **direction** and **size** of the force right. Don't forget to **label** the arrow with the force name)



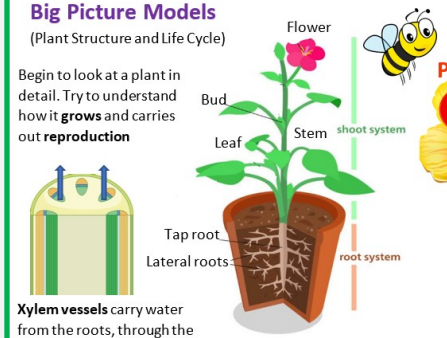
Contact Forces Non-Contact Forces



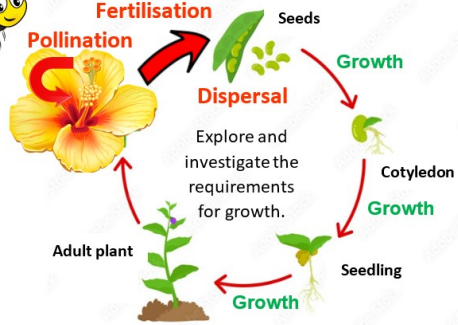
Big Picture Models

(Plant Structure and Life Cycle)

Begin to look at a plant in detail. Try to understand how it **grows** and carries out **reproduction**



Xylem vessels carry water from the roots, through the stem, to the leaves



Explore and investigate the requirements for growth.

DISCIPLINARY KNOWLEDGE AND SCIENTIFIC ENQUIRY:

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

YEAR 3

EXPLAINING SCIENCE

- I use science ideas to describe and explain.
- I remember science words that I have used before (longer term)
- I begin to use science models to describe (sequence).
- I add science labels and information to diagrams.
- I link relevant facts together in an answer.

CLASSIFICATION

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

DESIGNING EXPERIMENTS

- I predict cause and effect.
- I select suitable equipment for the task.
- I predict obvious risk and act on safety suggestions.
- I identify cause and effect in my investigation.
- I suggest a suitable data range for a variable.
- I follow written instructions and write a simple method.

DATA, TABLES AND GRAPHS

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

MAKING CONCLUSIONS

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

New Learning | Prior Learning

TEACH IT: Light

Year 3

Key Objectives (Statutory)	Key Skills Objectives: Explaining Science	Key Skills Objectives: Designing Experiments	Vocabulary
• Recognise that light is needed in order to see things and that dark is the absence of light.	⇒ Use key science words. ⇒ Remember science words used before.	⇒ Suggest what might happen in an investigation. ⇒ Predict cause and effect.	**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.**
• 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.	⇒ Use key science words. ⇒ Begin to use knowledge of energy transfer to describe.	⇒ Use a range of science equipment correctly. ⇒ Select suitable equipment.	
• Recognise that shadows are formed when the light from a light source is blocked by an opaque object.	⇒ Add labels and information to diagrams with support. ⇒ Add labels and information to diagrams independently.	⇒ Follow short, spoken and written, instructions. ⇒ Follow written instructions.	
• Find patterns in the way that the size of shadows change.			

Prior Learning

EYFS Foundations for Science: Learn that light comes from the sun, as part of their work on the Earth and Solar System. Have some awareness of shadows. Understand how sunlight alters during different seasons. Know that plants need light from the sun to grow.

Key Conceptual Knowledge And Understanding

Light

- ⇒ 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.

PRIOR LEARNING LINKS

EYFS Foundations for Science:
Learn that light comes from the sun, as part of their work on the Earth and Solar System. Have some awareness of shadows. Understand how sunlight alters during different seasons. Know that plants need light from the sun to grow.

Year 3 Science

Unit of Learning:

Light

FUTURE LEARNING LINKS

Y6 Light: Develop further understanding of how light travels and be able to describe the process in terms of reflected light energy, absorbed light energy and transmitted light energy. Experiment with light intensity and use data loggers to measure, describing patterns and making conclusions. Experiment with periscopes to learn about the journey of the ray of light. Investigate how the angle of the light source affects the size and shape of a shadow.

Teaching and Learning Sequence for this Unit.

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?
Key Skill:
Begin to use knowledge of energy transfer to describe.

What materials reflect light?
Which materials are the most reflective?

How do we measure reflected light energy?

Key Skill:
Predict using cause and effect.

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?

Key Skill:
Predict using cause and effect.

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?

Key Skill:
Predict using cause and effect.

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 Skill:
Begin to use knowledge of energy transfer to describe.

Key Learning Objectives:

- Recognise that light is needed in order to see things and that dark is the absence of light.
- Notice that light is reflected from certain 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 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 enables 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.

New Learning | Prior Learning

TEACH IT: Rocks

YEAR 3

KEY OBJECTIVES (STATUTORY)

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
- Describe in simple terms how fossils are formed when things that have lived are trapped within rock.
- Recognise that soils are made from rocks and organic matter.

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

⇒ Use key science words;
⇒ Remember science words used before.

⇒ Use key science words;
⇒ Begin to use knowledge of particles to describe.

⇒ Add labels and information to diagrams with support;
⇒ Add labels and information to diagrams independently.

CLASSIFICATION

⇒ Use simple spider key with obvious differences;
⇒ Use large spider key with obvious differences.

⇒ Group by difference, similarity or change;
⇒ Create criteria and groups for sorting.

⇒ Link properties of materials to an application;
⇒ Combine properties of materials required for an application.

VOCABULARY

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.

PRIOR LEARNING

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.

Y2 Uses of Everyday Materials: Recap common everyday materials and their basic properties. Compare the suitability of different materials for particular purposes. Investigate how the shape of solid objects can be changed by twisting, bending etc. Introduced to solids, liquids and gases. Sort solids and liquids.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

ROCKS

⇒ 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 and 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.

PRIOR LEARNING LINKS

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. Some experience of testing the properties of materials (absorbency).
Y2 Uses of Everyday Materials: Recap common everyday materials and their basic properties. Compare the suitability of different materials for particular purposes. Investigate how the shape of solid objects can be changed by twisting, bending etc.

Year 3 Science

Unit of Learning:

Rocks

FUTURE LEARNING LINKS

Y4 States of Matter: Learn more 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 do we already know about rocks?

How can we group different rocks together using their appearance and physical properties?

Key Skill:
Create groups for sorting.

What are rocks made of?

What are the different ways that rocks are formed?

What are rocks used for?

Key Skill:
Combine properties of materials required for an application.

How are rocks classified?

What similarities and differences do they have?

Key Skill:
Create groups for sorting.

What is a fossil?

How are fossils formed?

Where can fossils be found?

Key Skill:
Begin to use knowledge of particles to describe.

What is soil?

What is soil made from?

What are the different types of soil?

Key Skill:
Remember science words used before.

Key Learning Objectives:

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
- Describe in simple terms how fossils are formed when things that have lived are trapped within rock.
- Recognise that soils are made from rocks and organic matter.

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.
⇒ 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 and 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.

New Learning | Prior Learning

TEACH IT: Animals, including Humans

YEAR 3

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

⇒ Use key science words.
⇒ Remember science words used before.

⇒ Use key science words.
⇒ Begin to use knowledge of animals including humans to describe.

⇒ Add labels and information to diagrams with support.
⇒ Add labels and information to diagrams independently.

DATA, TABLES AND GRAPHS

⇒ Use a simple table, recording in words and numbers (including a tally).
⇒ Use a frame to construct simple tables.

⇒ Use the scale on a block chart to add the correct blocks.
⇒ Draw bars on bar charts.

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.

PRIOR LEARNING

Y2 Animals including Humans: Learn about vertebrates and invertebrates. Describe all the things that animals can do (MRS GREN). Understand that all humans and animals grow and change. Learn that food, water and air are essential for survival and that healthy eating, exercise and hygiene are important lifestyle choices.

KEY CONCEPTUAL KNOWLEDGE AND UNDERSTANDING

ANIMALS, INCLUDING HUMANS

⇒ 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 of 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 a number of 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.

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.
Y2 Animals, including Humans: Learn about vertebrates and invertebrates. Describe all the things that animals can do (MRS GREN). Understand that all humans and animals grow and change. Learn that food, water and air are essential for survival and that healthy eating, exercise and hygiene are important lifestyle choices.

Year 3 Science

Unit of Learning:

Animals, including Humans

FUTURE LEARNING LINKS

Y4 Animals, including Humans: Different types of teeth and their functions. The role of the mouth and teeth in the digestion process. Other parts of the digestive system and how the process works. Food chains and their different components. Understand how to interpret and construct food chains.

Teaching and Learning Sequence for this Unit.

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?

Key Skill:
Begin to use knowledge of nutrition to explain.

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?

Key Skill:
Begin to use knowledge of nutrition to explain.

How balanced is our diet?
Which different food groups do I eat the most/least of?

Key Skill:
Use frames to construct tables and bar charts.

Where is my skeleton and what does it do?
What are the different bones within the skeletal system and what do they do?

Key Skill:
Add labels and information to diagrams.

Do all animals have skeletons?
How and why do some animals have skeletons that are different to others?

Key Skill:
Add labels and information to diagrams.

How do we move?
Where are our muscles?
What do they do?

Key Skill:
Add labels and information to diagrams.

Key Learning Objectives:

- 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 Conceptual Knowledge and Understanding

⇒ Food is a balance of nutrients that the body needs.
⇒ There are a number of 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.
⇒ When you eat your body breaks down food into smaller components and absorbs them to use as fuel.
⇒ 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.

New Learning | Prior Learning

TEACH IT: Forces & Magnets

YEAR 3

KEY OBJECTIVES (STATUTORY)

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

KEY SKILLS OBJECTIVES

EXPLAINING SCIENCE

⇒ Use key science words.
⇒ Remember science words used before.

⇒ Use key science words.
⇒ Begin to use knowledge of forces to describe.

⇒ Add labels and information to diagrams with support.
⇒ Add labels and information to diagrams independently.

DESIGNING EXPERIMENTS

⇒ Suggest what might happen in an investigation.
⇒ Predict cause and effect.

⇒ Use a range of science equipment correctly.
⇒ Select suitable equipment.

⇒ Follow short, spoken and written, instructions.
⇒ Follow written instructions.

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.

PRIOR LEARNING

EYFS Foundations for Science: Explore and talk about simple forces that they can feel. Recognise a push or a pull as a force needed to move an object. Investigate simple forces, exploring how to push objects further /push or pull heavier objects, with more force. Explore magnets through continuous provision.

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.

PRIOR LEARNING LINKS

EYFS Foundations for Science: Explore and talk about simple forces that they can feel. Recognise a push or a pull as a force needed to move an object. Investigate simple forces, exploring how to push objects further /push or pull heavier objects, with more force. Explore magnets through continuous provision.

Y2: Uses of Everyday Materials: Investigate how the shape of solid objects can be changed by twisting, bending etc.

Year 3: Science

Unit of Learning:

Forces and Magnets

FUTURE LEARNING LINKS

Y5 Forces: Learning about the effects of contact and non-contact forces: friction, air resistance and up-thrust. Investigating levers and how the length of the lever might affect the force needed to lift a load. **(DT Links)**

Teaching and Learning Sequence for this Unit.

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
Key Skill:
Begin to use knowledge of forces to describe.

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?
Key Skill:
Predict cause and effect.

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?
Key Skill:
Predict cause and effect.

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?
Key Skill:
Begin to use knowledge of forces to describe.

Are all magnets the same?
Which magnet is the strongest?
What happens when we place different materials between a magnet and a paper clip?
Key Skill:
Follow written instructions.

Which materials are magnetic?
Are all metals magnetic?
Key Skill:
Predict cause and effect.

Key Learning Objectives:

- 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 on the basis of 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 Conceptual Knowledge and Understanding - Forces

⇒ 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 the Earth's poles-North and South.

⇒ Materials can be grouped together based upon whether they are attracted to a magnet (magnetic) or not.

New Learning | Prior Learning

TEACH IT: Plants

YEAR 3

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

⇒ Use key science words.
⇒ Remember science words used before.

⇒ Use key science words.
⇒ Begin to use knowledge of plants to describe.

⇒ Add labels and information to diagrams with support.
⇒ Add labels and information to diagrams independently.

DESIGNING EXPERIMENTS

⇒ Suggest what might happen in an investigation.
⇒ Predict cause and effect and identify it in investigation.
⇒ Identify the cause variable correctly.
⇒ Suggest a range for a variable.

MAKING CONCLUSIONS

⇒ Describe features & patterns in data.
⇒ Describe simple patterns in data, charts & graphs,
⇒ Describe the changes that have happened
⇒ Describe results linking cause & effect.

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 (testa), 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.

PRIOR LEARNING

Y1 Plants: Know that a plant is a living thing and that there are wild and garden plants. Name and locate some common ones. Know different parts of a tree and the difference between evergreen and deciduous trees

Y2 Plants: Learn different parts of a plant. Understand how plants grow through seed germination and bulbs sprouting. Learn about the condition plants need to grow and stay healthy. Learn about the basic lifecycle of a plant.

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.

PRIOR LEARNING LINKS

Y1 Plants: Know that a plant is a living thing and that there are wild and garden plants. Name and locate some common ones. Know different parts of a tree and the difference between evergreen and deciduous trees

Y2 Plants: Learn different parts of a plant. Understand how plants grow through seed germination and bulbs sprouting. Learn about the condition plants need to grow and stay healthy. Learn about the basic lifecycle of a plant.

Year 3 Science

Unit of Learning:

Plants

FUTURE LEARNING LINKS

Y4 States of Matter: Learn more about other states of matter as well as solids e.g. liquids and gases. Learn about evaporation and the water cycle.

Y4: Living Things and Habitats: Learn about the difference between flowering and non-flowering plants and the different ways that plants reproduce e.g. flowering using flowers to make seeds, non-flowering using spores or seed cones.

Teaching and Learning Sequence for this Unit.

Can you remember the parts of a plant?

What are the parts of a flowering plant and what do they do?

Key Skill:
Begin to use knowledge of plants to describe.

Do all plants need the same conditions to grow and live?

Can we remember all of the characteristics of living things?

Key Skill:
Describe patterns in data, charts and graphs.

How do leaves make food for the plant?

What can we learn about photosynthesis?

What gives leaves their green colour?

Key Skill:
Begin to use knowledge of plants to describe.

How does water get around the plant?

What do you notice when you give carnations water with coloured dye in?

Key Skill:
Describe results linking cause and effect.

What are the parts of a flower and why do plants have flowers?

What are the reproductive parts of a flower?

Key Skill:
Begin to use knowledge of plants to describe.

What is pollination?

Which insects pollinate flowers?

Why are bees so important?

Key Skill:
Remember science words.

How do plants spread their seeds?

Which seeds are dispersed by wind? Animals?

Does wind speed affect how far seeds will disperse?

Key Skill:
Identify cause & effect in investigations.

Key Learning Objectives:

- 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 Conceptual Knowledge and Understanding

⇒ **Refer to prior knowledge on plants on the TEACH IT: PLANTS PAGE.**

⇒ 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.

New Learning | Prior Learning

APPLY IT: Working Scientifically

YEAR 3

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:

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?

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?

Animals, including humans:

- Which fruits contain the most water?
- What food groups do different types of food contain and which are highest in energy?

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?

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?