Year 3 - Plants

National Curriculum Objectives	Sticky Knowledge	Vocabulary	
• Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowers • Explore the part flowers play in a flowering plants life cycle, including: pollination, seed formation and seed dispersal • Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants • Know the way in which water is transported between plants	• Plants are producers, they make their own food. • Their leaves absorb sunlight and carbon dioxide • Plants have roots, which provide support and draw water from the soil • Flowering plants have specific adaptations which help it to carry out pollination, fertilisation and seed production • Seed dispersal improves a plants chances of successful reproduction • Seeds/bulbs require the right conditions to germinate and grow. • Seeds contain enough food for the plant's initial growth	Air, light, water, nutrients, soil, support, anchor, reproduction, pollination, dispersal, transportation, flower, energy, growth, seedling, carbon dioxide, oxygen, sugar, material, photosynthesis, chlorophyll	
		Key Scientists	**Linked Texts**
		Jan Ingenhousz (Photosynthesis) **Joseph Banks** (Botanist)	***The Hidden Forest*** *(Jeannie Baker)* ***George and Flora's Secret Garden*** *(Jo Elworthy)*

Prior Learning	Common misconceptions	Future Learning
In Year 2 Children should: • Observe and describe how seeds and bulbs grow into mature plants. • Find out and describe how plants need water, light and warmth to grow and stay healthy.	Some children may think: • Plants eat food • Food comes from the soil via the roots • Flowers are merely decorative rather than a vital part of the life cycle in reproduction • Plants only need sunlight to keep them warm • Roots suck in water which is then sucked up the stem.	In Year 6 Children will: • Recognise that living things have changed over time and that fossils provide information about living things • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • Identify how animals and plants are adapted to suit their environment in different ways, and that adaptation can lead to evolution.

Teaching Ideas

Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals? Which conditions help seeds germinate faster?	How many different ways can you group our seed collection?	What happens to celery when it is left in a glass of coloured water? TAPS How do flowers in a vase change over time? How much water a plant needs TAPS	What colour flowers do pollinating insects prefer?	What are all the different ways that seeds disperse?

Year 3 - Animals, including humans

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. • Know how nutrients, water and oxygen are transported within animals and humans. • Know about the importance of a nutritious, balanced diet. • Identify that humans and some other animals have skeletons and muscles for support, protection and movement:	• Different animals are adapted to eat different foods. • Many animals have skeletons to support their bodies and protect vital organs. • Muscles are connected to bones and move them when they contract. • Movable joints connect bones.	Nutrients, nutrition, carbohydrates, protein, fats, vitamins, minerals, water, fibre, skeleton, bones, joints, endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates, muscles, contract, relax,

Key Scientists	Linked Texts
Adelle Davis (20th Century Nutritionist) **Marie Curie** (Radiation / X-Rays)	***The Story of Frog Belly Rat Bone*** *(Timothy Basil Ering)* ***Funnybones*** *(Janet and Allan Ahlberg)* ***I Will Never Not Ever Eat a Tomato*** *(Lauren Child)* ***Goldilocks and the Three Bears*** *(Samantha Berger)*

Prior Learning	Common misconceptions	Future Learning
In Year 2 children should: • Know that animals, including humans, have offspring which grow into adults • Know the basic stages in a life cycle for animals, including humans. • Find out and describe the basic needs of animals, including humans, for survival (water, food and air). • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Some children may think: • Certain whole food groups like fats are 'bad' for you • Certain specific foods, like cheese are also 'bad' for you • Diet and fruit drinks are 'good' for you • Snakes are similar to worms, so they must also be invertebrates • Invertebrates have no form of skeleton.	In Year 4 children will: • Describe the simple functions of the basic parts of the digestive system in humans. • Identify the different types of teeth in humans and their simple functions. • Construct and interpret a variety of food chains, identifying producers, predators and prey

Teaching Ideas

Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
How does the angle that your elbow/knee is bent affect the circumference of your upper arm/thigh? Ask Qs about the human skeleton/ body TAPS	How do the skeletons of different animals compare?	How does our skeleton change over time? (from birth to death)	Do male humans have larger skulls that female humans?	Why do different types of vitamins keep us healthy and which foods can we find them in?

Year 3 - Forces (& magnetism)

National Curriculum Objectives	Sticky Knowledge	Vocabulary	
• Compare how things move on different surfaces. • Know how a simple pulley works and use making lifting an object simpler • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract and 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 with attract or repel each other, depending on which poles are facing.	• Magnets exert attractive and repulsive forces on each other. • Magnets exert non-contact forces, which work through some materials. • Magnets exert attractive forces on some materials. • Magnet forces are affected by magnet strength, object mass, distance from object and object material.	Force, push, pull, friction, surface, magnet, magnetic, magnetic field, pole, north, south, attract, repel, compass	
		Key Scientists	**Linked Texts**
		William Gilbert (Theories on Magnetism) Andre Marie Ampere (Founder of Electro-Magnetism)	The Iron Man (Ted Hughes) Mrs Armitage: Queen of the Road (Quentin Blake) Mr Archimedes' Bath (Pamela Allen)

Prior Learning	Common misconceptions	Future Learning
In Year 2 children: • May have an awareness of how to make things stop and start, using simple pushes and pulls. • They may know about floating and sinking.	Some children may think: • The bigger the magnet the stronger it is • All metals are magnetic	In Year 5 children will: • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object and the impact of gravity. • Identify the effects of air resistance, water resistance and friction, which act between moving surfaces. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. • 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 • Describe the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Teaching Ideas

Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
Compare diff. tracks for a balloon rocket. TAPS Compare show grips TAPS Compare ramp surfaces TAPS Test strongest magnets TAPS	Which materials are magnetic?	If we magnetise a pin, how long does it stay magnetised for?	Do magnetic materials always conduct electricity? Does the size and shape of a magnet affect how strong it is?	How have our ideas about forces changed over time? How does a compass work?

Year 3 - Energy (Light & Sight)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by a solid object. • Find patterns in the way that the sizes of shadows change.	• There must be light for us to see. Without light it is dark. • We need light to see things even shiny things. • Transparent materials let light through them and opaque materials don't let light through. • Beams of light bounce off some materials (reflection). • Shiny materials reflect light beams better than non-shiny materials. • Light comes from a source	Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent.

Key Scientists	Linked Texts
James Clerk Maxwell (Visible and Invisible Waves of Light)	The Owl Who Was Afraid of the Dark (Jill Tomlinson) The Dark (Lemony Snicket) The Firework-Maker's Daughter (Philip Pullman)

Prior Learning	Common misconceptions	Future Learning
In Year 1 children should have: • Observed changes across the four seasons • Observed and describe weather associated with the seasons and how day length varies. Children may: • have some knowledge of were light comes from. • have seen their shadows and may know they appear when it is sunny. • Have some understanding of a reflection. • May understand they need light to be able to see things.	Some children may think: • We can still see even where there is an absence of any light • Our eyes 'get used to' the dark • The moon and reflective surfaces are light sources • A transparent object is a light source • Shadows contain details of the object, such as facial features on their own shadow • Shadows result from objects giving off darkness	In Year 6 children will: • 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 light sources 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. • Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

Teaching Ideas

Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
How does the distance between the shadow puppet and the screen affect the size of the shadow? Compare materials forming shadows TAPS	How would you organise these light sources into natural and artificial sources?	When is our classroom darkest? Is the Sun the same brightness all day?	Are you more likely to have bad eye sight and to wear glasses if you are older?	How does the Sun make light?

Year 3 - Materials (Rocks)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• 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	• There are different types of rock. • There are different types of soil. • Soils change over time. • Different plants grow in different soils. • Fossils tell us what has happened before. • Fossils provide evidence. • Paleontologists use Fossils to find out about the past. • Fossils provide evidence that living things have changed over time.	Rocks, igneous, metamorphic, sedimentary, anthropic, permeable, impermeable, chemical fossil, body fossil, trace fossil, Mary Anning, cast fossil, mould fossil, replacement fossil, extinct, organic matter, top soil, sub soil, base rock.

Key Scientists	Linked Texts
Mary Anning (Discovery of Fossils) **Inge Lehmann** (Earth's Mantle)	***The Pebble in My Pocket*** *(Meredith Hooper)* ***Stone Girl, Bone Girl*** *(Laurence Anholt)* ***The Street Beneath My Feet*** *(Charlotte Guillain & Yuval Zommer)*

Prior Learning	Common misconceptions	Future Learning
In Year 2 children should: • 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 shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Children may: • May have some understanding of a variety of different rocks in the natural world. • Some understanding of what soil is. (how to identify soil etc) • May have some knowledge of what a fossil is.	Some children may think: • Rocks are all hard in nature • Rock-like, man-made substances such as concrete or brick are rocks • Materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer 'natural' • Certain found artefacts, like old bits of pottery or coins, are fossils • A fossil is an actual piece of the extinct animal or plant • Soil and compost are the same thing.	In Year 4 children will: • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. In Year 6 children will: • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

Teaching Ideas

Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
Which soil absorbs the most water? Which rock would be most durable? TAPS	Can you use the identification key to find out the name of each of the rocks in your collection?	How does tumbling change a rock over time? What happens when water keeps dripping on a sandcastle?	Is there a pattern in where we find volcanos on planet Earth?	Who was Mary Anning and what did she discover?