Year 3 – Scientific Enquiry Skills

	Comparative Test	• Asking relevant question and using different types of scientific enquiries to answer them. • Setting up simple, practical enquiries, comparative and fair tests. • Using results to draw simple conclusions, make predications for new values, suggest improvements and raise further questions.
	Identify & Classify	• Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.
	Observation Over Time	• Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers, rulers and data loggers.
	Pattern Seeking	• Identify differences, similarities or changes related to simple scientific ideas and processes.
	Research & Communication	• Using straight forward scientific evidence to answer questions or to support their findings. • Record findings using simple scientific language, for example labelled diagrams and drawings, bar charts, tables and keys. • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

Maths within Science

Types of Scientific Enquiry

Comparative / fair testing
Changing one variable to see its effect on another, whilst keeping all others the same.

Research
Using secondary sources of information to answer scientific questions.

Observation over time
Observing changes that occur over a period of time ranging from minutes to months.

Pattern-seeking
Identifying patterns and looking for relationships in enquiries where variables are difficult to control.

Identifying, grouping and classifying
Making observations to name, sort and organise items.

Skill Statements

Asking questions
Asking questions that can be answered using a scientific enquiry.

Making predictions
Using prior knowledge to suggest what will happen in an enquiry.

Setting up tests
Deciding on the method and equipment to use to carry out an enquiry.

Observing and measuring
Using senses and measuring equipment to make observations about the enquiry.

Recording data
Using tables, drawings and other means to note observations and measurements.

Interpreting and communicating results
Using information from the data to say what you found out.

Evaluating
Reflecting on the success of the enquiry approach and identifying further questions for enquiry.

Year 3

- ★ I can ask *relevant* questions about the world.
- ★ I am beginning to recognise that questions can be answered in different ways using the different types of Scientific Enquiry.

- ★ I can identify new questions arising from the data
- ★ I can make new predictions based on my results

- ★ I can (with some guidance) set up simple practical enquiries, comparative and fair tests
- ★ I can (with support) perform these enquiries & tests

- ★ I am beginning to make systematic and careful observations
- ★ I am beginning to take accurate measurements using standard units and a range of equipment

- ★ I can gather, record, classify and present data in a variety of ways to answer questions
- ★ I am beginning to decide how best to record my findings

- ★ I am beginning to communicate my findings in a variety of ways.
- ★ I am beginning to use scientific evidence from my enquiry to answer questions

- ★ I am beginning to discuss my results in relation to my prediction.
- ★ I am beginning to say what I would change about my investigation.

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, nutrition, soil, support, anchor, reproduction, pollination, dispersal, transportation, flower, flowering plants, functions, energy, growth, leaves, seedling, carbon dioxide, oxygen, sugar, material, photosynthesis, chlorophyll, room to grow, roots, seedling, trunk.

Key Scientists	Linked Texts
George Washington Carver - Botanist	Foxton Primary Science books Lower KS2 – All about Plants A seed is sleepy – Dianna Hutts Aston Who was George Washington Carver?

Prior Learning	Key Question(s):	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.**	• Do all flowers look the same? • What do seeds do? • Can a plant live without its leaves? • Do grass/trees make flowers? • What conditions are perfect for a seed to grow? • Do plants take in water through their roots? • How does water move through the plant? • How do plants make their food? • How does light affect plant growth? • How does a plant get carbon dioxide?	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

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
What factors affect plant growth? 	What are the functions of a flowering plant and how are they used in photosynthesis? 	How is water transported in plants? 	What role do flowers play in the life-cycle of flowering plants?	What is pollination?	How are seeds dispersed? 	

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. Bones, Joints, skeleton, muscles, contract, diet, healthy, relax, nutrition, nutrients, energy, carbohydrates, protein, fibre, fats, vitamins, minerals, water, vertebrate, invertebrate, exoskeleton, endoskeleton	Nutrients, nutrition, carbohydrates, protein, fats, vitamins, minerals, water, fibre, skeleton, support, diet, food groups, meals, healthy, humans, muscles, movement, bones, joints, endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates, muscles, contract, relax, Key Scientists: Linked Texts: The Book of bones -10 record breaking animals – Anna Claybourne The Anthology of Intriguing animals – Ben Hoare Foxton Primary Science books Lower KS2 – The human body My Strong mind – Niels Van Hove
Prior Learning	**Key Question(s):**	**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.**	• Why do we need a skeleton? • What types of skeleton are there? • Are all skeletons the same? • Can something survive without a skeleton? • How do we move? • Are bones that are bigger, stronger? • Why do we need joints? • Why do muscles get tired?	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

Week 1	Week 2	Week 3	Week 4	Week 5	BIG Question – Assessment Opportunity
How do nutrients benefit our body?	Where do we find our daily nutrients?	Do all animals have bones?	What bones do we have in the human body?	How do we move?	Consolidation. Investigation: Do bigger hands mean you have bigger feet? Extra session (5 on Dev Exp)

Year 3 – Forces (& Magnetism)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• **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 and repel each other and attract some materials and not others.**	• 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, contact, materials, strength, surface, compass, metal. Key Scientists: Linked Texts:

• **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.**	Force, attract, push, pull, magnetic (field), material, surface, strength, metal, repel, friction, non-contact		**Mrs Armitage: Queen of the Road** Quentin Blake **The Iron Man:** Ted Hughes The Iron Woman – Ted Hughes Foxton Primary Science books Lower KS2 – Magnets and Friction
Prior Learning	**Key Question(s):**	**Future Learning**	
In Early Years children should: • **know about similarities and differences in relation to places, objects, materials and living things.** • **talk about the features of their own immediate environment and how environments might vary from one another.** • **make observations of animals and plants and explain why some things occur, and talk about changes.** **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.**	• What are magnetic materials? How can we find out? • How far away does a magnet have to be before it attracts a magnetic material? • How far away can the magnetic attraction between two magnets be experiences? • How is the magnetic attraction of repulsion force affected by putting materials between the magnets? • Are bigger magnets stronger?	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 on our lives. • 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

Week 1	Week 2	Week 3	Week 4	Research	BIG Question – Assessment Opportunity
What effect does forces have on objects?	How do different surfaces affect friction?	Which materials are magnetic?	Does the size of a magnet affect its strength? Which magnet is the most powerful? I can explore magnetic poles.	What materials do magnets attract? (Magnet game) Application of knowledge	Consolidation (Express event – Magnet game)

Year 3 – (ENERGY) Light & Dark

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.**	• There must be light for us to see. Without light it is dark (absence) • We need light to see things even shiny things. • Transparent materials let light through them and opaque materials don't let light through.	Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, absence, protect, block, transparent, translucent, danger.	
		Key Scientists	Linked Texts

• **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.**	• Beams of light bounce off some materials (reflection). • Shiny materials reflect light beams better than non-shiny materials. • Light comes from a source • Know how to stay safe in the sun opaque, light source, natural, non-natural, light source, reflection, bounce, straight, UV rays, protect	**Ibn al-Haytham** Astronomer, physicist & World's First Scientist.	Foxton Primary Science books Lower KS2 - Light
Prior Learning	**Key Question(s):**	**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.**	• How does being in darkness affect your sense of balance? • What colour would be the best to make a safety jacket from? • How does the texture of a material affect how reflective it is? • How can we change the darkness, size and shape of a shadow?	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

Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	BIG Question – Assessment Opportunity
What creates light? **What is a light source?** **What do we need to see? (DARK TENT)**	How do we stay safe in the sun?	How are shadows formed?	Can we notice patterns in the size of shadows?	Which surfaces reflect light?	What is a shadow? What can we see in the dark tent?

Year 3 – Materials

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. • Rocks are formed in different ways. • Soil is made up of living and non-living matter. • Explain how fossils are formed. • Fossils provide evidence that living things have changed over time. Language the children will be able to use: rocks, igneous, metamorphic, sedimentary, permeable, impermeable, magma, erosion, sediment, fossil, crystals, crumbly, extinct, soil.	Rocks, igneous, metamorphic, sedimentary, permeable, impermeable, magma, erosion, sediment, fossil, Mary Anning, crystals, grains, extinct, organic matter, top soil, sub soil.	
		Key Scientists	Linked Texts
		Mary Anning -Discovery of Fossils James Hutton – Geologist Career Opportunity – Katie Joy – Lunar Geologist	The Pebble in My Pocket - Meredith Hooper The Street Beneath My Feet - Charlotte Guillain & Yuval Zommer Foxton Primary Science books Lower KS2 - Rocks
Prior Learning	**Key Question(s):**	**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.**	• How are rocks formed? • How are rocks the same/different? • How are the soils different? • Which is more likely to lead to flooding? • What rock is best for….? • What types of rocks are there? • How do rocks change? • Why do you think worms are important to the creation of soil? • How are fossils created? • Why do fossils help us find out about historical events? • If you could fossilise an object what would it be?	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

Week 1	Week 2	Week 3	Week 4	Week 5	Assessment
How are these rocks different or similar?	Can a rock's properties give us clues about how they are formed?	How are fossils formed?	What are the components of soil?		Hamilton Quiz