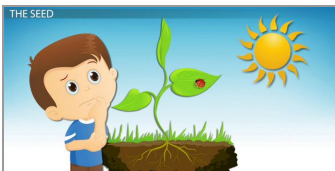


Year	Topic	Topic	Topic	Topic	Topic
1	Plants (Identifying Plants)	Seasonal changes	Animals, including humans (Identifying Animals)	Everyday materials	
2	Plants (Growing Plants)	Living things and their habitats (Living in Habitats)	Animals, including humans (Growth and Survival)	Uses of everyday materials (Exploring Everyday Materials)	
3	Plants (How Plants Grow)	Light (Light and Shadow)	Animals, including humans (Health and Movement)	Rocks (Rocks, Fossils and Soils)	Forces and magnets
4	Sound	Living things and their habitats (Living in Environments)	Animals, including humans (Eating and Digestion)	States of matter	Electricity (Circuits and Conductors)
5	Earth and space	Living things and their habitats (Life Cycles curriculum links to Sex Ed/RSE)	Animals, including humans (Changes and Reproduction)	Properties and changes of materials	Forces (Forces in Action)
6	Evolution and inheritance	Living things and their habitats (Classifying Organisms)	Animals, including humans (Healthy Bodies)	Light (Seeing Light)	Electricity (Changing Circuits)

Progression in Working Scientifically;

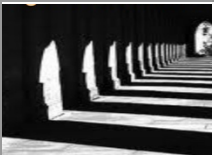
Lower KS2 (for pupils working towards Year 3 and 4 Curriculum):	Check list
Asking relevant questions and using different types of scientific enquires to answer them.	
Setting up simple practical enquiries, comparative and fair tests.	
Making systematic and careful observations and, where appropriate, 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.	



Year 3 – Plants (How Plants Grow?)

NC Objectives and Learning Objectives/Assessment criteria from Classroom Monitor	Essential Knowledge	Working Scientifically (follow year 3 and 4)
	Key Learning:	Key Question(s):
- 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 I can identify and label different parts of flowering plants e.g. roots, stem, leaves, petals and stamen. I can explain the function/s of each part of a flower. I can explain how pollination and fertilisation take place I can set up a test to find out what plants need to grow. I can record my observations. I can use scientific language to present the results of my investigation.	Children must know and understand that: - 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 plant's chances of successful reproduction - Seeds/bulbs require the right conditions to germinate and grow. - Seeds contain enough food for the plant's initial growth	- How do plants reproduce? - Do all flowers look the same? - How do insects know which flowers to pollinate? - Why do flowers smell? - 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? - Where do weeds come from? - How does the space between seeds affect how well they grow? - Does seed size match plant size? - 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?
	Using and Applying knowledge: - Observe what happens to plants over time when leaves or roots are removed - Observe the effect of putting cuts of celery in coloured water - Investigate what happens to plants in different conditions e.g. dark place, cold place, deprived of air, different types of soil. - Observe flowers carefully to identify the pollen	PLAN Resources for Assessment (via Canvas): - Progression in working scientifically skills Year 3&4 - Working scientifically skills Year 3&4 - PLAN Primary Science – Supporting Assessment (Plants Year 3 – J.R.)

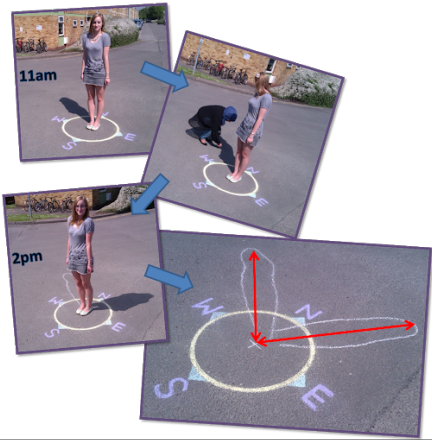
I can investiage how water is transported in plants.	- Observe flowers being visited by pollinators e.g. bees and butterflies in the summer [if not possible, watch a video of the action] - Research different types of seed dispersal - Classify seeds into groups of how they are dispersed				
Prior Learning	Misconceptions:				
In Year 2 Children should: - Look closely (observe closely) at plants and trees and record what they see. - Plant seeds and bulbs and suggest how to care for them. - Set up a test and make a prediction. - Describe the life cycle of plants. - Identify if plants are living or dead. - Describe what plants need to grow. - Observe and describe the growth of seeds. - Observe and describe the growth of bulbs. - Record the results of a comparative test. - Make a bar chart to show the growth of their plants.	- 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 via the stem	<i>In Year 6 Children will:</i> - Recognise that living things DO change 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.			
Vocabulary [TA to create a list of key vocabulary, add sign graphics AND pictures next to each word]:					
Air, light, water, nutrients, soil, support, anchor, reproduction, pollination, dispersal, transportation, flower, energy, growth, seedling, carbon dioxide, oxygen, sugar, material, photosynthesis, chlorophyll					
Teaching Ideas (examples) – Year 3 & 4 Working Scientifically					
Ask simple questions	Observing closely	Performing simple test	Identifying & classifying	Gathering & recording data	Using observation to suggest answers to questions
Why do plants have flowers? Purpose of flowers	What happens to celery when it is left in a glass of coloured water?	Which conditions help seeds to germinate quickly?	Identify and classify different ways seeds disperse.	Measure growth of seeds in different conditions and record data.	Which coloured flowers attract bees? (yellow, purple, blue, violet and white.)

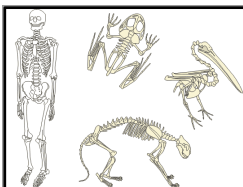


Year 3 – Light (Light and Shadow)

NC Objectives and Learning Objectives/Assessment criteria from Classroom Monitor	Essential Knowledge	Working Scientifically (follow year 3 and 4)
	Key Learning:	Key Question(s):
- 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. - I can recognise that I need light to see things, and that dark is the absence of light. - I can use a mirror to reflect light and explain how mirrors work. - I know that light from the sun can be dangerous and that there are ways we can protect our eyes. - I can demonstrate how shadows are created. - I can investigate which materials block light to form shadows. - I can recognise that shadows are formed when the light from a light source is blocked by a solid object. - I can find patterns in the way that the size of shadows change.	Children must know and understand that: - 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.	- A coin is lost, what would be the best way to find it? (Turn the lights out and see it shine? Use a torch to see it reflect?) - How does distance from a light source affect how bright it looks? - How does the colour of a material affect how reflective it is? - What would be the best material to make a blind for a baby's room? - How does thickness of a material affect how much light can pass through it? - How many pieces of tracing paper are as translucent as a single piece of white paper? - How does the shape of a mirror affect how the light reflects? - How can we change the darkness, size and shape of a shadow?
	Using and Applying knowledge: - Explore how different objects are more or less visible in different levels of lighting. - Explore how objects with different surfaces e.g. shiny vs matt are more or less visible. - Explore how shadows vary as the distance between a light source, an object or surface is changed.	PLAN Resources for Assessment (via Canvas): - Progression in working scientifically skills Year 3&4 - Working scientifically skills Year 3&4 - PLAN Primary Science – Supporting Assessment (Light Year 3 – Johnny)

	- Explore shadows are formed / not formed e.g. shadows of clouds and children playing in the playground. - Choose suitable materials to make shadow puppets. - Create artwork using shadows.				
Prior Learning	Misconceptions:				
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. Pupils may: - have some knowledge of where 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.	- We can still see even when 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 object giving off darkness.	<i>In Year 6 Children will:</i> - 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.			
Vocabulary [TA to create a list of key vocabulary, add sign graphics AND pictures next to each word]: Force, push, pull, friction, surface, magnet, magnetic, magnetic field, pole, north, south, attract, repel, compass.					
Teaching Ideas (examples) – Year 3 & 4 Working Scientifically					
Ask questions	Observing closely	Performing test	Identifying & classifying	Gathering & recording data	Using observation to suggest answers to questions
What colour would be the best to make a safety jacket from e.g. for a cyclist who rides to work at night?	Go outside the classroom and choose one location with an object fixed in its place. Observe how shadows on the fixed object changes throughout the day when the earth moves?		Identify and classify which materials are opaque, transparent and translucent.	Record the changes in the shadows throughout the day.	Shadows are caused by the movement of the earth or sun?





Year 3 – Animals, including humans (Health and Movement)

NC Objectives and Learning Objectives/Assessment criteria from Classroom Monitor	Essential Knowledge	Working Scientifically (follow year 3 and 4)
- 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. - I can describe/explain how humans and animals get food and drink. - I can describe/explain why humans and animals need the right food and drink to survive (right type of nutrients). - I can identify that humans and animals need skeletons.	Key Learning: Children must know and understand that: - 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.	Key Question(s): - Why do we need a skeleton? - What types of skeleton are there? - Are all skeletons the same? - Can something survive without a skeleton? - What happens if we break a bone? - How do we move? - Are bones that are bigger, stronger? - Why do we need joints? - Why do muscles get tired? - Can we 'break' muscles?
	Using and Applying knowledge: - Use food labels to explore the nutritional content - Use food labels to answer questions e.g. how much fat do different pizza contain? How much sugar is in soft drinks?	PLAN Resources for Assessment (via Canvas): - Progression in working scientifically skills Year 3&4 - Working scientifically skills Year 3&4 - PLAN Primary Science – Supporting Assessment (Animals including Humans Year 3 - Amelie)

• I can describe what happens if animals and humans do not have skeletons. • I can identify and label bones on the human skeleton. • I can compare and label the skeleton of a human and one of an animal. • I can identify and describe three different types of skeletons. • I can identify and explain the 3 main functions of a skeleton (to support, protect and move). • I can identify and label bones that protect the human body. • I can identify and label bones that support the human body. • I can identify and label bones that help the human body to move. • I can describe/explain why we need muscles. • I can set up a simple practical experiment to show the workings of muscles. • I can record my findings.	• Plan a diet that contain a good balance of nutrients (with support) Investigate: • People with longer legs run faster? • People with bigger hands catch a ball better?	Science resources at FBS: • Model of human skeleton • X-ray images of different bodies (humans and animals) •
Prior Learning In Year 2 Children should: • I can describe how animals/humans change as they grow. • I can match animals/human and their babies. • I can describe what animals need to grow and survive. • I can sort and label the stages of growth in humans. • I can describe what humans need to grow and survive (water, food, air (oxygen)).	Misconceptions: • Certain food groups like fats are 'bad' for you • Certain food like cheese are 'bad' for you • Diet and fruit drinks (including energy drinks) are 'good' for you • Snakes are similar to worms, so therefore they must be invertebrates • Invertebrates do not have skeletons	<i>In Year 4 Children will:</i> • 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

- I can identify healthy and unhealthy food and draw/say what I should eat.
- I can draw/list ways I can improve my diet.
- I can list reasons why humans need to exercise.
- I can give examples why we need to keep ourselves clean.

Vocabulary [TA to create a list of key vocabulary, add sign graphics AND pictures next to each word]:

Nutrients, nutrition, carbohydrates, protein, fats, vitamins, minerals, water, fibre, skeleton, bones, joints, endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates, muscles, contract, relax

Teaching Ideas (examples) – Year 3 & 4 Working Scientifically

Ask questions	Observing closely	Performing test	Identifying & classifying	Gathering & recording data	Using observation to suggest answers to questions
What happens if we do not eat a healthy diet?	Observe the length of bones in babies and adults? Does it show we change over time (from birth to adult)?	Identify which muscles we use for running, lifting books etc.	Identify, classify and compare skeletons of different animals e.g. birds, 4-legged animals, fish.	Gather information about sugar contents in fizzy drinks and record it. Draw a chart/graph showing the sugar contents in different fizzy drinks.	Why are animal skeletons different from humans? Pupils must think of an animal and compare it with humans.



Year 3 – Rocks (Rocks, Fossils and Soils)

NC Objectives and Learning Objectives/Assessment criteria from Classroom Monitor	Essential Knowledge	Working Scientifically (follow year 3 and 4)
	Key Learning:	Key Question(s):
- 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 the rock - Recognise that soils are made from rocks and organic matter I can compare different rocks. I can group rocks based on their properties. I can explain how fossils are formed by dead matters trapped between rocks. I can recognise that soils are made from rocks and organic materials. I can do an investigation to find out what soil is made of and present my findings using scientific vocabulary.	Children must know and understand that: - 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. - Palaeontologists use fossils to find out about the past. - Fossils provide evidence that living things have changed over time.	- How are the soils different? - Which soil do you think has the best drainage? - Which soil is more likely to lead to flooding? - How many soil types have we found? - Where might you find more? - How might the soil be different in different countries? - What rock is best for a kitchen chopping board? - What might be the issue with various materials and what they have to withstand? - What types of rocks are there? - How do rocks change? - What would grow best in your soil? - Why do you think worms are important to the creation of soil? - How can we use composting to make our own soil? - Does it currently look like real soil? - How long do you think this process will take and why? - How are fossils created? - How do fossils help us find out about historical events? - If you could fossilise an object, what would it be?
	Using and Applying knowledge:	PLAN Resources for Assessment (via Canvas):

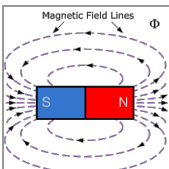
	• Observe rocks closely • Classify rocks in a range of ways e.g. based on their appearances • Devise a test to investigate the hardness of rocks • Devise a test to investigate how much water different rocks absorb • Observe how rocks change over time e.g. gravestones or a building • Observe soil closely • Classify soils in a range of ways based on their appearances • Devise a test to investigate water retention of soils (and ask why?)	• Progression in working scientifically skills Year 3&4 • Working scientifically skills Year 3&4 • PLAN Primary Science – Supporting Assessment (Rocks Year 3 -Nailah)
Prior Learning In Year 2 Children should: • Give examples of everyday materials. • Identify uses of different everyday materials. • Identify and group uses of everyday materials. • 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. • Demonstrate different materials can change the shape of an object. • Describe what recycling means and give examples.	Misconceptions: • Rocks are all hard • Rock-like, man-made substances such as concrete or brick are rocks • Materials which have been polished or shaped for use, such as granite worktop, are not rocks as they are no longer 'natural' • A fossil is an actual piece of the extinct animal or plant • Soil and compost are the same thing	<i>In Year 4 children will:</i> • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when heated or cooled, 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. <i>In Year 6 children will:</i> • Recognise that living things change over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

Vocabulary [TA to create a key list of vocabulary, add sign graphics AND pictures next to each word]:

Environment, flowering, non-flowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrates, human impact, nature reserves, deforestation.

Teaching Ideas (examples) – Year 3 & 4 Working Scientifically

Ask questions	Observing closely	Performing simple test	Identifying & classifying	Gathering & recording data	Using observation to suggest answers to questions
What is the difference between soil and compost?	Observe the differences between hard and soft rocks (pictures/photos) and the impact it has on the environment.	Investigate what soils are made of.	Identify and classify the matters found in the soil.	Based on the test, what matter did you find and can you identify which is organic and non-organic?	What happens if I add sand to the soil? Does it help to drain water quickly?



Year 3 – Force and Magnets

NC Objectives and Learning Objectives/Assessment criteria from Classroom Monitor	Essential Knowledge	Working Scientifically (follow year 3 and 4)
	Key Learning:	Key Question(s):
- Compare how things move on different surfaces. - Know how a simple pulley works and use something to make 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, attract some materials and not others. - Compare and group together a variety of everyday materials on the basis of whether or not 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 each other. I can compare how things move on different surfaces. I can observe that some forces need contact between two objects, but magnetic forces can act at a distance. I can observe how magnets attract or repel against each other. I can identify materials that attract and materials that repel. I can describe magnets as having two poles.	Children must know and understand that: - Pushing and pulling can make things move faster or slower. - Pushing and pulling can make things move or stop. - Things can move in different ways. - Larger masses require bigger pushes and pulls to move or stop them. - Bigger pushes and pulls have bigger effects. - Pushing and pulling can change the shape of things. - Magnets can attract and repel each other. - Magnets exert non-contact forces, which work through some materials. - Magnets attract through some materials. - Magnetic forces are affected by the magnet's strength, object mass, distance from the object and the object material. - Magnets have north and south poles.	- How can we change the way an object moves? - How does a material affect how fast a ball rolls down a slope? - How does the length/steepness of a slope affect how far a ball/car/tin will roll off at the end? - How can a push or a pull force make an object go further? - How does the harder/longer I press a pop-up toy has on the affect of how high it jumps out? - Which surface do objects roll the best on? Is it the same for sliding? - Which material is best for a teddy/clown bungee cord? - How does length of an elastic band affect how elastic it is? - Which tights are the most elastic (denier)? - What are magnetic materials? How can we find out? - Can I make a magnetic material non-magnetic? - 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? - How can the magnetic attraction of repulsion force be affected by putting materials between the magnets? - Are bigger magnets the strongest?
	Using and Applying knowledge:	PLAN Resources for Assessment (via Canvas):

• I can draw and describe magnets with two poles (North and South poles). • I can describe what happens if I put two magnets with same or opposite poles together. • I can predict whether two magnets will attract or repel each other, depending on which poles are facing each other. • I can compare and group everyday materials that are magnetic and non-magnetic.	• Carry out investigations exploring how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of our shoes etc. • Explore which materials are attracted to magnets. • Classify materials according to whether they are magnetic or not. • Explore the ways that magnets behave in relation to each other. • Explore how magnets work at a distance e.g. through the table, in water, jumping paper clip up off the table.	• Progression in working scientifically skills Year 3&4 • Working scientifically skills Year 3&4 • PLAN Primary Science – Supporting Assessment (Forces and Magnets Year 3 – Naithan)
Prior Learning	Misconceptions:	
In EYFS 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.	Misconceptions: • The bigger the magnets, the stronger it is. • All metals are magnetic.	<i>In Year 5 Children will:</i> • 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.

Vocabulary [TA to create a list of key vocabulary, add sign graphics AND pictures next to each word]:

Force, push, pull, friction, surface, magnet, magnetic, magnetic field, pole, north, south, attract, repel, compass.

Teaching Ideas (examples) – Year 3 & 4 Working Scientifically

Ask questions	Observing closely	Performing test	Identifying & classifying	Gathering & recording data	Using observation to suggest answers to questions
Where can you find magnetic objects at home?	How does a compass work?	Investigation – test the strength of magnets.	Which materials are magnetic?	How does the mass of an object affect how much force is needed to make it move? Which magnet is the strongest?	Does the size and shape of a magnet affect how strong it is?