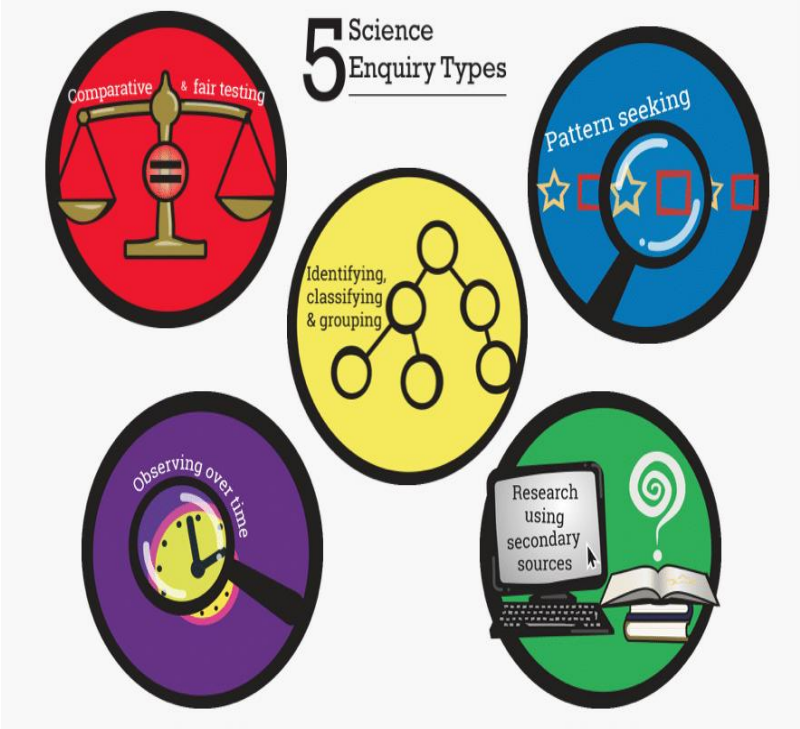
Science Long Term Plan INTERIM

The main three aims in science are:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.
- Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Children will achieve these aims through a range of scientific enquiries and the Plan, Do, Review approach which assesses childrens working scientifically skills.



TAPS Working Scientifically Cycle

The five scientific enquiry types in science are:

- **Comparative and fair testing** – Pupils identify the effect of changing one variable on another whilst attempting to keep other variables constant. They are useful for gathering data that might inform predictions and further tests. In comparative tests pupils compare one event with another and identify different outcomes. With fair tests pupils look to identify a causal relationship between two variables.

- **Pattern seeking** - Pupils make observations and measure to explore natural events where there are variables that they can't easily control. They seek to identify patterns in the measurements, which may lead to other investigations in an effort to try to explain why a particular pattern occurred.

- **Identifying, classifying and grouping** – Pupils sort objects, materials, living things or events into manageable sets using different criteria.

- **Observation over time** – Pupils identify and measure events and changes in living things, materials and physical processes or events. These observations may take place over time spans of minutes or hours up to several weeks or months.

- **Secondary research** - Pupils use a range of secondary sources (books, websites, articles, people, videos etc.) to gather evidence to answer questions. They look for patterns in the information they collect, evaluating the reliability and trustworthiness of the evidence they collect when drawing conclusions.

Every lesson and enquiry type should be underpinned by at least one or more working scientifically skills as shown below:

	Science skill		Science skill
	Asking scientific questions		Presenting results
	Planning an enquiry		Interpreting results
	Observing closely		Drawing conclusions (KS2 only)
	Taking measurements		Making predictions (KS2 only)
	Gathering and recording results		Evaluating an enquiry (KS2 only)

EYFS Science Long Term Plan

EYFS Aims
In the Early Year Foundation Stage, children begin to learn that as they grow up they are increasingly able to do more things for themselves independent, through planned and independently explored opportunities in their environment. This emerging knowledge and understanding can be used to explore crucial early scientific skills. The aims and content address a number of key scientifically concepts. These are presented through a cross-curricular approach that aims to develop children's learning across a range of the key learning areas. The early learning goals at EYFS aim to guide children to make sense of their physical world and their community by exploring, observing and finding out about the environment. The aims of our EYFS curriculum is to develop children's early scientific skills by providing rich experiences to promote the following:
Three and Four-Year-Olds
Communication and Language **Pupils should be given the opportunity to:** - Understand 'why' questions, like: "Why do you think the caterpillar got so fat?" **Personal, Social and Emotional Development** **Pupils should be given the opportunity to:** - Make healthy choices about food, drink, activity and tooth brushing **Understanding the World** **Pupils should be given the opportunity to:** - Use their senses in hands-on exploration of natural materials - Explore collections of materials with similar and/or different properties - Talk about what they see, using a wide vocabulary - Begin to make sense of their own life-story and family's history - Explore how things work. - Plant seeds and care for growing plants - understand the key features of the life cycle of a plant and an animal - Begin to understand the need to respect and care for the natural environment and all living things - Explore and talk about different forces they can feel - Talk about the differences between materials and changes they notice
Reception
Communication and Language **Pupils should be given the opportunity to:** - Learn new vocabulary - Ask questions to find out more and to check what has been said to them - Articulate their ideas and thoughts in well-formed sentences - Describe events in some detail - Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen - Use new vocabulary in different contexts **Personal, Social and Emotional Development** **Pupils should be given the opportunity to:** - Know and talk about the different factors that support their overall health and wellbeing - regular physical activity - healthy eating

- tooth brushing
- sensible amounts of screen time
- having a good sleep routine
- being a safe pedestrian

Understanding the World
Pupils should be given the opportunity to:
- Explore the natural world around them
- Describe what they see, hear and feel while they are outside
- Recognise some environments that are different to the one in which they live
- Understand the effect of changing seasons on the natural world around them

ELG

ELG: Communication and Language – Listening, Attention and Understanding
Pupils should be given the opportunity to:
- Make connections about what they have heard and ask questions to clarify their understanding

ELG: Personal, Social and Emotional Development – Managing Self
Pupils should be given the opportunity to:
- Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choice.

ELG: Understanding the World – The Natural World
Pupils should be given the opportunity to:
- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processing and changes in the natural world around them, including the seasons and changing states of matter

Season

This topic will be ongoing throughout the year and will be included throughout your other topics.
- Seasonal walks (welly walks)
- Discuss appropriate clothing (the clothes on a doll/teddy)
- Using photos, what is the weather like? Why is she wearing sunglasses?
- Matching pictures to clothes. Matching trees to the weather.
- Leaf matching
- Taking photos and talking about them.
-

Key Vocabulary

N – Autumn, Winter, Spring, Summer, hot, cold, sun, wind, ice, snow, rain, cloud
R – Seasons, hail, mist, fog, dew, warm, damp, overcast

Autumn 1	Spring 1	Summer 1
Humans • Different parts of the human body. • Make robot hands. • Look at how they have changed and how we are different from each other. • Drawing pictures of their face.	**Materials** • Talk about why things happen and how things work. • Natural and found objects. • Floating and sinking. • Freezing and melting. • Magnets.	**Habitats** • Talk about where you live and what nature is. • Talk about how we care for animals. • Talk about things observed such as plants and animals. • Notice features of objects in their environment. • Light and dark – linked to habitats.

• Talk about different food and limits of those. **Life cycles** • Baby – toddler – child - adult	• Testing materials.	•
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**
N – Baby, grown up, boy, girl, head, body, arms, legs, nose, mouth, eyes, healthy, choice R – Adult, child, toddler, ears, face, features, grow, change, life cycle, sugar, fats, teeth	N – Materials, water, plastic, metal, wood, ice, glass R – Floating, sinking, freezing, melting, magnets, shiny, dull, rough, smooth	N – Home, cold, hot, food, drink, dark, safe, animal, plant R – Habitat, warm, care, liquid, environment, light, observed
Start Small Dream Big	**Start Small Dream Big**	**Start Small Dream Big**
School Nurse	**GSK – Material Scientist -** GlaxoSmithKline - SchoolScience.co.uk	**Zoologist**
Autumn 2	**Spring 2**	**Summer 2**
Forces • Similarities and differences in relation to places, objects, materials and living things. • Car ramps – different ramps or cars. • Ball rolling. • Push and pull toys. **Electricity** • Understand that some object need electricity to work. • Understand a switch will turn something on and off. • Build circuits. *To have a range of battery operate items on the investigation table.	**Plants** • Observations of plants, trees and flowers. • Planting and growing. • Planting cress on the investigation table. • Draw plants and trees and talk about them. • Seasonal walks. **Animals** • Understanding of growth and change (including lifecycles). • Talk about observations. • Farm animals, zoo animals and sea animals – similarities and differences. • How we care about animals (visits from Hearing Dogs)	**Habitats** • Continuation from Summer 1 **Mini beasts** • Make a bug den. • Watching the life cycle of a butterfly. • Small world play. • Bug hunt in different habitats. • Spider web hunt. • Bug boxes and magnifying glasses. • Be a minibeast detective.
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**
N – Push, pull, plug, charge R – Force, push, pull, magnet, battery, electricity	N – Tree, flower, plant, leaf, change, grow, Spring, Autumn, Summer, Winter, different, cress, water R – Seasons, trunk, stem, petal, blossom, bloom, change, growth, care, investigate, same, life cycle	N – Home, bugs, dark, food, dry, magnifying glass, bug hunt, look R – Habitat, light, feed, water, drink, binoculars, observe, detective
Start Small Dream Big	**Start Small Dream Big**	**Start Small Dream Big**
Forces and Motion Workshop (Physicist) Forces and Motion Workshops for Schools - We list them here. Take a look. (educationalworkshops.co.uk) **Fire Service (Electrical Safety)**	**Botanist** **Zoologist -** ZooLab | Classroom Animal Encounters | Animal Therapy | United Kingdom (zoolabuk.com)	**Zoologist**

Key Stage One Long Term Plan

Year 1		
Autumn	**Spring**	**Summer**
Autumn 1 Animals, including humans	**Spring 1** Everyday Materials **Spring 2** Careers Term	**Summer 1** Year 1 – Plants **Summer 2** Seasonal Changes

Year 2		
Autumn	**Spring**	**Summer**
Autumn 1-2 Year 2 - Use of everyday materials	**Spring 1** Living Things and Their Habitats **Spring 2** Careers Term	**Summer 1** Animals Including Humans **Summer 2** Plants

Working Scientifically Year 1 and 2 (To be complete during every topic)

- Asking simple questions and recognising that they can be answered in different ways
- Observing closely, using simple equipment
- Performing simple tests
- Identifying and classifying
- Using their observations and ideas to suggest answers to questions
- Gathering and recording data to help in answering questions.

Year One Science Long Term Plan

Autumn 1&2

Animals, including humans

- Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.
- Identify and name a variety of common animals that are carnivores, herbivores and omnivores.
- Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals.
- Identify, name, draw and label the basic parts of the human body and say which part is associated with each sense.

Scientific enquiries

- *Identifying, classifying and grouping – mammals, fish, birds and reptiles.*
- *Identifying, classifying and grouping – carnivore, omnivore and herbivore.*
- *Identifying, classifying and grouping – Name and parts of the human body.*
- *Pattern seeking - Compare animals within the mammal, reptile, bird, fish or amphibian groups to spot similarities and differences in their features and abilities.*
- *Comparative and fair test – Using different senses*

Additional scientific enquires for additional lessons

- *Secondary research – diets of animals which are herbivores, omnivores and carnivores.*
- *Pattern seeking - Notice links between why certain animals can or cannot be found living in the local area.*
- *Observation over time - Identify which senses are being used over a period of time to find out which sense is being used the most and least.*

Key Scientist
David Attenborough (1926 -)
https://www.wwf.org.uk/get-involved/schools/calendar/a-life-on-our-planet-ks2

Key Vocabulary

Spring 1

Everyday Materials

- Distinguish between an object and the material from which it is made
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- Describe the simple physical properties of a variety of everyday materials
- Compare and group together a variety of everyday materials on the basis of their simple physical properties.

Scientific enquiries

- *Identifying, classifying and grouping – Different materials.*
- *Identifying, classifying and grouping – properties of objects and materials.*
- *Pattern seeking – Do all plastics bend? Are all glasses transparent?*
- *Comparative and fair test – Test materials (waterproof or not waterproof)*

Key Scientist
Becky Schroeder (1962-)
Female Scientist (squarespace.com)

Key Vocabulary

Material	Plastic	hard/soft
Object	Metal	transparent/opaque
Property	Waster	solid/liquid/gas
Wood	Rock	shiny/dull
Glass	Physical properties	smooth/rough

Start Small Dream Big

GlaxoSmithKline (Materials scientist) - GlaxoSmithKline - SchoolScience.co.uk

Spring 2

Whole School Events –

Summer 1

Plants

- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees
- Identify and describe the basic structure of a variety of common flowering plants, including trees.

Scientific enquiries

- Identifying, classifying and grouping – types of trees
- Identifying, classifying and grouping – wild and garden plants

Key Scientist
Carolus Linnaeus (1879 – 1955)
Carolus Linnaeus - Biography, Facts and Pictures (famousscientists.org)

Key Vocabulary

Autumn 1&2			Spring 1	Summer 1		
Omnivore Herbivore Carnivore Fish Amphibian Gils Scales Fins Hearing	Torso Sight Backbone Mammal	Vertebrae Invertebrate Reptile Limbs Smell Taste Touch Bird		Wild Cultivated Deciduous Roots	Flowering Evergreen Structure Twig	Leaves Trunk Flowers Branch
Start Small Dream Big			**Start Small Dream Big**	**Start Small Dream Big**		
Exoctic animal workshop (Zoologist) - Welcome to animalstory.co.uk... - Animal Story - Animal workshops|North East|Middlesbrough|Stockton|Darlington|Hartlepool				**Botanist**		
Key Vocabulary – Working Scientifically *** to be used continually throughout the year.**						
Answer Question Observe Equipment		Identify Classify Sort Group		Record Compare Describe Contrast		

In each related term:

Year 1 – Seasonal Changes • Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies.	Day length Seasons Summer Winter Rain gauge	Spring Autumn Light Dark Forecast

Year Two Science Long Term Plan

Autumn

Use 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.

Scientific enquiries

- *Identifying, classifying and grouping – Different materials*
- *Identifying, classifying and grouping – Properties of materials.*
- *Comparative and fair test – metal suitability for fishing game.*
- *Secondary research – What materials can be recycled?*

Key Scientist
John McAdam (1756-1836)
John Loudon McAdam - Students | Britannica Kids | Homework Help

Spring

Living things and their habitats

- Explore and compare the differences between things that are living, dead, and things that have never been alive
- Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- Identify and name a variety of plants and animals in their habitats, including microhabitats
- Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Scientific enquiries

- *Identifying, classifying and grouping – Things which are alive, dead or never alive.*
- *Identifying, classifying and grouping – nature park/woodland - things which are living, dead or never alive.*
- *Pattern seeking – Similarities and differences of the needs of 3 common animals.*
- *Observation over time – Create a minibeast habitat, observe changes over time.*
- *Identifying, classifying and grouping – Plant habitats.*

Key Scientist
David Attenborough (1926 -)
https://www.wwf.org.uk/get-involved/schools/calendar/a-life-on-our-planet-ks2

Key Vocabulary

Living Dead Never alive Survival Variety	Growth Sensitivity Variations Food chain Nutrition	Habitat Food web Microhabitat Organism Microhabitat	Movement Reproduction Characteristics Respiration

Start Small Dream Big

Botanist

Summer

Animals, including humans

- Notice that animals, including humans, have offspring which grow into adults
- Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Scientific enquiries

- *Identifying, classifying and grouping – adult animals and their offspring.*
- *Pattern seeking – What activities make our heart rate faster and slower.*
- *Identifying, classifying and grouping – healthy and unhealthy foods.*
- *Comparative and fair test – Impact of food on exercise (star jumps before and after dinner)*
- *Observation over time – soap and pepper investigation*

Key Scientist
Elizabeth Anderson (1836-1917)
BBC - History - Elizabeth Garrett Anderson

Key Vocabulary

Same as Year 1 and: Kitten Puppy Hygiene Energy	Tadpole Offspring Adult Air Species	Survival Nutrition Water Exercise Germs

Start Small Dream Big

<table>
<tr><th>Autumn</th><th>Spring</th><th>Summer</th></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td>Spring 2</td><td>Summer 2</td></tr>
<tr><td></td><td rowspan="2">Whole School Events –</td><td><u>Plants</u>
• Observe and describe how seeds and bulbs grow into mature plants
• Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Scientific enquiries
• Observation over time – planting a bulb (class)
• Observation over time – planting two seeds. One watered the other one not watered (class)
• Observation over time – planting a seed (individual)
• Observation over time – extreme conditions for growing conditions (too hot, too much water)
• Pattern seeking – Are there areas where plants grow more healthily?
• Pattern seeking – Do bigger seeds germinate more quickly?
• Comparative and fair test – What conditions does a plant need to grow and stay healthy.
• Secondary research – life cycle/different plants.

Key Scientist
Carolus Linnaeus (1879 – 1955)
Carolus Linnaeus - Biography, Facts and Pictures (famousscientists.org)</td></tr>
<tr><td>Key Vocabulary
Recap Year 1 and:
Squash
Bend

Twist
Stretch
Waterproof/not waterproof</td><td>Key Vocabulary
Year 1 Vocabulary and:
Seeds
Growth
Mature
Dispersal

Conditions
Bulbs
Nutrients
Germinate

Year 1 Vocabulary and:
Seeds
Growth
Mature
Dispersal</td></tr>
<tr><td>Start Small Dream Big</td><td>Start Small Dream Big</td><td>Start Small Dream Big</td></tr>
<tr><td>GlaxoSmithKline (Materials scientist) – GlaxoSmithKline - SchoolScience.co.uk</td><td></td><td>Zoo Lab (Zoo keeper) – ZooLab | Classroom Animal Encounters | Animal Therapy | United Kingdom (zoolabuk.com)</td></tr>
<tr><td colspan="3">Key Vocabulary – Working Scientifically
* to be used continually throughout the year.</td></tr>
<tr><td colspan="3">Answer
Question
Observe
Identify
Classify
Sort
Record
Compare
Describe</td></tr>
</table>

Autumn	Spring	Summer
Equipment	Group	Contrast

Lower Key stage 2 Science Long Term Plan

Year 3		
Autumn	**Spring**	**Summer**
Autumn 1 **Year 3 - Forces and magnets** **Autumn 2** **Year 3 - Light**	**Spring 1** **Year 3 – Animals including humans** **Spring 2** * science term spring 2	**Summer 1** **Year 3 – Rocks** **Summer 2** **Year 3 - Plants**

Year 4		
Autumn	**Spring**	**Summer**
Autumn 1 **Year 4 - Animals, including humans** **Autumn 2** **Year 4 - States of matter**	**Spring 1** **Year 4 - Sound** **Spring 2** * science term spring 2	**Summer 1** **Year 4 – Living things and their habitats** **Summer 1** **Year 4 - Electricity**

Working Scientifically Year 3 and 4 (to be completed throughout all topics within the year)
• 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.

Year Three Science Long Term Plan

Autumn

Year 3 - Forces and magnets

- 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.

Scientific enquiries

- *Comparative & fair test – friction investigation*
- *Comparative & fair test – paper clip and magnet experiment*
- *Identifying, classifying and grouping – magnetic and non-magnetic.*
- *Comparative & fair test – keys experiment*

Key Scientist

William Gilbert (1544-1603)

https://www.famousscientists.org/william-gilbert/

Key Vocabulary

Magnetic	Compare	Push
Force	Poles	Pull
Magnets	North	Resistance
Repel	Materials	
Attract	South	

Start Small Dream Big

Forces and Motion Workshop (Physicist)

Forces and Motion Workshops for Schools - We list them here. Take a look. (educationalworkshops.co.uk)

Spring

Year 3 - Animals, including humans

- 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.

Scientific enquiries

- *Identifying, classifying and grouping – Food groups.*
- *Secondary research – Food groups.*
- *Secondary research – diets of average person, body builder and marathon runner.*
- *Secondary research – different joints (hinge, glide, ball and socket)*

Key Scientist

Adelle Davis (1904-1974)

Davis, Adelle (1904–1974) | Encyclopedia.com

Key Vocabulary

Incisor	Producer	Stomach
Canine	Predator	Intestine (Sm + LG)
Food chain	Prey	Rectum
	Consumer	Scavenger
	Oesophagus	Consumer

Start Small Dream Big

Noisy Toys - (Acoustician) - Shows (noisytoys.org)

Summer

Year 3 - Rocks

- 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.

Scientific enquiries

- Identifying, classifying and grouping - Rocks and their type.
- Comparative and fair test - Permeability and durability of rocks
- Secondary research – Rock types

Key Scientist

Mary Anning (1799-1847)

Who was the fossil hunter Mary Anning? - BBC Bitesize

Key Vocabulary

Appropriate Key Stage 1 vocabulary and:	Crumbly	Soils
Rocks	Crystals	Organic
Appearance	Sedimentary	Matter
Magma	Fossils	Igneous
Permeable	Lava	Metamorphic
	Impermeable	Sediment
		Density

Start Small Dream Big

Rocks and Fossils Workshop (paleontologist) - Palaeoquest - Fossil, Workshop, Rocks

Autumn

Year 3 - Light

- recognize that they need light in order to see things and that dark is the absence of light
- notice that light is reflected from surfaces
- recognize that light from the sun can be dangerous and that there are ways to protect their eyes
- recognize 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.

Spring

Whole School Events –

Summer

Year 3 - Plants

- 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

<table>
<tr><th>Autumn</th><th>Spring</th><th>Summer</th></tr>
<tr>
<td colspan="3">Scientific enquiries
• Identifying, classifying and grouping – natural, manmade or not light sources.
• Identifying, classifying and grouping – reflective materials or not
• Comparative and fair test – design, make and test a badge.
• Pattern seeking – UV lights
• Identifying, classifying and grouping – opaque, transparent and translucent.
• Comparative and fair test – opaque puppet and the shadow it casts.

Key Scientist
Albert Einstein (1879 – 1955)
https://www.twinkl.co.uk/teaching-wiki/albert-einstein#:~:text=Einstein%20discovered%20the%20idea%20that,lots%20of%20branches%20of%20science.</td>
<td></td>
<td>• investigate the way in which water is transported within plants
• explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Scientific enquiries
Observation over time – tomato, cactus and cress in sand and compost.
• Observation over time – onions test.
• Observation over time – celery/carnations in coloured water.
Key Scientist
Carolus Linnaeus (1879 – 1955)
Carolus Linnaeus - Biography, Facts and Pictures (famousscientists.org)</td>
</tr>
<tr><td colspan="3">Key Vocabulary</td><td></td><td colspan="2">Key Vocabulary</td></tr>
<tr>
<td>Light
Dark
Reflected/reflection
Surface</td>
<td>Sun
Shadows
Translucent
Patterns
Emit
Pupil
Retina</td>
<td>Opaque
Transparent</td>
<td></td>
<td>Key Stage 1 Vocabulary and:
Transportation
Pollination
Seed dispersal
Seed formation
Stigma</td>
<td>Life cycle
Stem
Roots
Function
Nutrients
Anther</td>
</tr>
<tr><td colspan="3">Start Small Dream Big</td><td>Start Small Dream Big</td><td colspan="2">Start Small Dream Big</td></tr>
<tr><td colspan="3">Optical Scientist</td><td></td><td colspan="2">Botanist</td></tr>
<tr><td colspan="6">Key Vocabulary – Working Scientifically
* to be used continually throughout the year.</td></tr>
<tr><td colspan="3">Revisit Year 1/2 vocabulary and:
Measure
Investigate
Compare
Fair test
Conclusions</td><td colspan="3">Predictions
Evidence
Improve
Construct
Interpret</td></tr>
<tr><td colspan="3">Interpreting and gathering data
* not all applicable to every lesson or unit of work.</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="6">Tally charts
Tables
Pictographs
Bar graphs</td></tr>
</table>

Year Four Science Long Term Plan

Autumn	Spring	Summer
Year 4 - Animals, including humans • 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. *Scientific enquiries* • *Secondary research – role of teeth in digestive system.* • *Secondary research – role of tongue in digestive system.* • *Observation over time – eggs in different liquids.* • *Identifying, classifying and grouping – animal groups.* • *Identifying, classifying and grouping – animal food chains.* ***Key Scientist***	**Year 4 - Sound** • identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds travel through a medium to the ear • find patterns between the pitch of a sound and features of the object that produced it • find patterns between the volume of a sound and the strength of the vibrations that produced it • Recognise that sounds get fainter as the distance from the sound source increases. *Scientific enquiries* • *Pattern seeking – tuning forks in water.* • *Comparative & fair test – rice and drums.* • *Comparative & fair test – earmuff investigation* • *Pattern seeking – using a range of instruments to investigate the range of sounds they make.* • *Comparative & fair test – water xylophone* ***Key Scientist*** *Alexander Graham Bell (1847 – 1922)* *https://www.bbc.co.uk/bitesize/topics/zxwxvcw/articles/z4vp7nb?scrlybrkr=cdb7c3f3*	**Year 4 - Living things and their habitats** • recognise that living things can be grouped in a variety of ways • explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • Recognise that environments can change and that this can sometimes pose dangers to living things. *Scientific enquiries* • *Identifying, classifying and grouping – animal groups* • *Identifying, classifying and grouping – animals into environments* • *Secondary research – refer to progression document* ***Key Scientist*** *David Attenborough (1926 -)* *https://www.wwf.org.uk/get-involved/schools/calendar/a-life-on-our-planet-ks2*
Key Vocabulary	**Key Vocabulary**	**Key Vocabulary**
Key Stage 1 Vocabulary and: Diet Survive Carbohydrates Protein Joints/Hinge/gliding Protection Esophagus Teeth Support Stomach Mouth Intestine Hydro skeleton Dairy	Vibrations Sound wave Travel Ear Distance Sound source Pitch Volume Loudness Amplitude Frequency Wave Amplitude Decibel Frequency Medium Soundproof Vacuum	Classification Mini beasts Vertebrate Microorganisms Characteristics Group Keys Plants Environment Changes Endangered species Dangers
Start Small Dream Big	**Start Small Dream Big**	**Start Small Dream Big**
School Nurse **NHS online workshop** **Zoo Lab (Zoo keeper) -** ZooLab | Classroom Animal Encounters | Animal Therapy | United Kingdom (zoolabuk.com)	**GlaxoSmithKline (Materials scientist) -** GlaxoSmithKline - SchoolScience.co.uk	**Zoo Lab (Zoo keeper) -** ZooLab | Classroom Animal Encounters | Animal Therapy | United Kingdom (zoolabuk.com)
Autumn	**Spring**	**Summer**
Year 4 - States of matter • compare and group materials together, according to whether they are solids, liquids or gases • observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)	**Whole School Events –**	**Year 4 - Electricity** • identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers

- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Scientific enquiries

- *Identifying, classifying and grouping – Solids, liquids and gases.*
- *Secondary research – Different melting and freezing points.*
- *Observation over time – How long to melt chocolate, crayons and ice over a heat.*
- *Observation over time – Water cycle in a bag*
- *Comparative and fair test – Salt and ice investigation.*

Key Scientist
John Dalton (1766-1844)
John Dalton Facts for Kids (kiddle.co)

Key Vocabulary

Recap appropriate KS1 Vocabulary and	Heat	Solid
Condensation	Cool	Liquid
Evaporation	Melt	Gas
Precipitation	Freeze	Temperature
Water cycle	Particles	Properties
	Celsius	

- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- recognize that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- Recognize some common conductors and insulators, and associate metals with being good conductors.

Scientific enquiries

- *Identifying, classifying and grouping – mains, battery, wind up, force*
- *Comparative and fair test – Materials as conductors or insulators*

Key Scientist
Alessandro Volta (1745-1827)
Alessandro Volta - Students | Britannica Kids | Homework Help

Key Vocabulary

Electricity	Bulbs	Insulator	Magnetic
Circuits	Switches	Attract	Non-magnetic
Series	Buzzers	Repel	Poles
Voltage	Lamp	Forces	North
Cells	Conductor	Materials	South
Wires	Mains	Battery	Generator

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School Nurse
NHS online workshop
Zoo Lab (Zoo keeper) – ZooLab | Classroom Animal Encounters | Animal Therapy | United Kingdom (zoolabuk.com)

Start Small Dream Big

Start Small Dream Big

Electricity safety (Fire brigade)
Electricity Buzz Wire (Electrical engineer) – Electricity Buzz Wire — STEMworks

Key Vocabulary – Working Scientifically
*** to be used continually throughout the year.**

Revisit Year 1/2 vocabulary and:
Measure
Investigate
Compare
Fair test
Conclusions

Predictions
Evidence
Improve
Construct
Interpret

Interpreting and gathering data* not all applicable to every lesson or unit of work.

Tally charts
Tables
Pictographs
Bar graphs

Upper Key Stage 2 Long Term Plan

Year 5		
Autumn	**Spring**	**Summer**
Autumn 1 **Year 5 – Properties and changes of changes of materials** **Autumn 2** **Year 5- forces**	**Spring 1** **Year 5 – Animals including Humans** **Spring 2** * science term spring 2	**Summer 1** **Year 5 – Living things and their habitats** **Summer 2** **Year 5 – Earth and Space**

Year 6		
Autumn	**Spring**	**Summer**
Autumn 1 **Year 6 – Living things and their habitats** **Autumn 2** **Year 6 – Light**	**Spring 1** **Year 6 – Electricity** **Spring 2** * science term spring 2	**Summer 1** **Year 6 - Evolution and inheritance** **Summer 2** **Year 6 – Animals including humans**

Working Scientifically Year 5 and 6 (To be complete during every topic)
• planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • Identifying scientific evidence that has been used to support or refute ideas or arguments.

Year Five Long Term Plan

<table>
<tr><th>Autumn</th><th>Spring</th><th>Summer</th></tr>
<tr><td><u>Year 5 – Properties and changes of materials</u>
• compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
• know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
• use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
• give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
• demonstrate that dissolving, mixing and changes of state are reversible changes

Scientific enquires
• Identifying, classifying and grouping – durability, transparency, conductivity and magnetism.
• Comparative test – Dissolving a solid into a liquid.
• Identifying classifying and grouping – solids, liquids and gases.
• Comparative and fair test – best materials for switch, cup and pan.

Key Scientist
Ruth Benerito (1916-2013)
Ruth Benerito - Kids | Britannica Kids | Homework Help</td><td><u>Year 5 – Animals including humans</u>
• Describe the changes as humans develop to old age.

Key Scientist
Charles Darwin (1809-1882)
KS2: Charles Darwin – The biggest name in Victorian science - BBC Teach</td><td><u>Year 5 – Living Things and their habitats</u>
• describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
Describe the life process of reproduction in some plants and animals.

Key Scientist
David Attenborough (1926 -)
https://www.wwf.org.uk/get-involved/schools/calendar/a-life-on-our-planet-ks2</td></tr>
<tr><td>Key Vocabulary
Recap appropriate LKS2 Vocabulary and:
Transparency
Conductivity
Thermal
Filtering
Reversible & irreversible changes
New Materials
Chemical changes
Solution
Evaporate
Boiling
Mixing
Separation
Soluble
Sieve
Magnetic
Solubility
Dissolving
Saturated</td><td>Key Vocabulary
Life cycle
Toddler
Baby
Teenager
Adolescent
Adult
Infant</td><td>Key Vocabulary
Appropriate Key Stage 1 vocabulary and:
Life cycles
Fur
Size
Feathers
Leaves
Flowers
Bird
Bulbs
Seeds
Amphibian
Mammal
Insect
Reproduction</td></tr>
<tr><td>Start Small Dream Big
GlaxoSmithKline (Materials scientist) - GlaxoSmithKline - SchoolScience.co.uk</td><td>Start Small Dream Big
Electricity safety (Fire brigade)
Electricity Buzz Wire (Electrical engineer) - Electricity Buzz Wire — STEMworks</td><td>Start Small Dream Big
Zoo Lab (Zoo keeper) - ZooLab | Classroom Animal Encounters | Animal Therapy | United Kingdom (zoolabuk.com)</td></tr>
<tr><td>Autumn</td><td>Spring</td><td>Summer</td></tr>
</table>

Year 5 – Forces

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- Recognize that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Scientific enquires

- Secondary research – Effects of gravity on different planets
- Comparative and fair test – Air resistance
- Pattern seeking – Streamlining shapes
- Comparative and fair test – car/shoe friction investigation
- Identifying, classifying and grouping – pulley, lever or gear.

Key Scientist

Sir Issac Newton (1544-1603)

Isaac Newton: The man who discovered gravity - BBC Teach

Key Vocabulary

Year 3 vocabulary and: Gravity Air resistance Water resistance Load Fulcrum	Friction Levers Pulley Gears Buoyancy Streamlined Mechanism	Newton Opposing Streamline Effort

Start Small Dream Big

Forces and Motion Workshop (Physicist)

Forces and Motion Workshops for Schools - We list them here. Take a look. (educationalworkshops.co.uk)

Whole School Events –

Start Small Dream Big

Year 5 – Earth and Space

- 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

Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Scientific enquires

- Secondary research – planets and length of years.
- Secondary research – significant events around the moon.
- Secondary research – earth, moon and sun spherical.
- Pattern seeking – size of planet and how long it takes to move around the sun.

Key Scientist

Nicolaus Copernicus (1473-1543)

Science KS2: The work of Nicolaus Copernicus - BBC Teach

Key Vocabulary

Recap some of the appropriate Key Stage 1 Vocabulary and: Solar system Moon Sun Sphere/spherical	Rotation Day/night Planets Earth Orbit	Stationary Axis Mercury, Venus, Jupiter, Saturn, Uranus, Neptune. Geocentric and heliocentric.

Start Small Dream Big

Life Centre Science @ Home (astronomer) – Life Online Archive - Centre For Life

Key Vocabulary – Working Scientifically
*** to be used continually throughout the year.**

Revisit Year 3/4 vocabulary and: Plan Variables Measurements Accuracy	Precision Scientific diagrams Classification Graphs	Data Predictions Conclusion Relationships	Support Identify Patterns Quantitative measurements

Year Six Science Long Term Plan

Autumn 1	Spring 1	Summer 1
Year 6 – Living Things and their habitats • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • Give reasons for classifying plants and animals based on specific characteristics. *Scientific enquires* • Identifying, classifying and grouping – animal groups. • Secondary research – Linnaeus and his classification system. • Observation/pattern seeking – growth of bacteria. ***Key Scientist*** *David Attenborough (1926 -)* https://www.wwf.org.uk/get-involved/schools/calendar/a-life-on-our-planet-ks2	**Year 6 – Electricity** • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. • Use recognised symbols when representing a simple circuit in a diagram. *Scientific enquires* • Identifying, classifying and grouping – working and non-examples of circuits. • Observation – What will happen with bulb or buzzer in different circuits. ***Key Scientist*** *Alessandro Volta (1745-1827)* Alessandro Volta - Students | Britannica Kids | Homework Help	**Year 6 - Evolution and inheritance** • recognize that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • recognize 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 may lead to evolution. *Scientific enquires* • Secondary research – different forms of fossilisation. • Secondary research – Alfred Russel Wallace. • Secondary research – Charles Darwin. ***Key Scientist*** ***Charles Darwin (1809-1882)*** KS2: Charles Darwin – The biggest name in Victorian science - BBC Teach
	Key Vocabulary	**Key Vocabulary**
Appropriate prior vocabulary and: Deciduous Non deciduous Skin/damp Scales Eggs Asexual Fertilise Metamorphosis Reproduce Gestation Life Cycle	**Year 4 vocabulary and:** Neutrons Protons Electrons Resistance Appliances Mains Wires Bulbs Current Battery Buzzer Switch Conductor Insulator	Fossils Adaptation Evolution Characteristics Ancestor Reproduction Genetics Variation Biome Inherited Environmental Mutation Extinct
Start Small Dream Big	**Start Small Dream Big**	**Start Small Dream Big**
Life Centre Science @ Home (astronomer) - Life Online Archive - Centre For Life	**Electricity safety (Fire brigade)** **Electricity Buzz Wire (Electrical engineer) -** Electricity Buzz Wire — STEMworks	**Biological Diversity (Biodiversity scientist) -** Biological Diversity - Hands On Science (hands-on-science.co.uk)
Autumn 2	**Spring 2**	**Summer 2**
Year 6 - Light • 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. *Scientific enquires* • Identifying, classifying and grouping – natural, chemical and man-made light sources	**Whole School Events –**	**Year 6 – Animals including humans** • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • recognize the impact of diet, exercise, drugs and lifestyle on the way their bodies function • Describe the ways in which nutrients and water are transported within animals, including humans. *Scientific enquires* • Secondary research – blood vessels/blood • Identifying, classifying and grouping – food groups. ***Key Scientist***

<table>
<tr><th>Autumn 1</th><th>Spring 1</th><th>Summer 1</th></tr>
<tr><td>

- Pattern seeking – Is reflection the same with different surfaces?
- Observation – refraction investigations
- Secondary research – periscope
- Identifying, classifying and grouping – opaque, translucent and transparent

Key Scientist
Issac Newton (1642-1727)
Science KS2: Discovering the work of Sir Isaac Newton - BBC Teach

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Daniel Hale Williams (1858-1931)
Science: Scientists and Inventors: Daniel Hale Williams Year 6 Lesson Pack 6 (twinkl.co.uk)

</td></tr>
<tr><td>Key Vocabulary</td><td></td><td>Key Vocabulary</td></tr>
<tr><td>

LKS2 Vocabulary and:
Refraction
Periscope
Reflected rays
Incident rays
Angle of incident
Refraction
Visible spectrum
Prism
Optic nerve
Ciliary muscle
Cornea
Iris

</td><td></td><td>

Appropriate Lower Key Stage 2 Vocabulary and:
Heart
Valves
Vein
Blood Drugs
Artery
Life style
Blood vessels
Capillaries
Involuntary muscle
Plasma
Drug/Alcohol
Nutrients
Food groups

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<tr><td>Start Small Dream Big</td><td>Start Small Dream Big</td><td>Start Small Dream Big</td></tr>
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Optical Scientist

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School Nurse
NHS online workshop
Zoo Lab (Zoo keeper) - ZooLab | Classroom Animal Encounters | Animal Therapy | United Kingdom (zoolabuk.com)

</td></tr>
<tr><td colspan="3">Key Vocabulary – Working Scientifically
* to be used continually throughout the year.</td></tr>
<tr><td colspan="3">

Revisit Year 3/4 vocabulary and:
Plan
Variables
Measurements
Accuracy
Precision
Scientific diagrams
Classification
Graphs
Data
Predictions
Conclusion
Relationships
Support
Identify
Patterns
Quantitative measurements

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