Science at Malin Bridge

'Science is the study of the world both living and non-living. Science helps discover how and why things happen the way they do through experiments and investigations.'

"Science is the skill of working together to discover the world around us." *Benji Y6*

Vision

Our vision for Science is to inspire a love for life long learning and interest in science. Our high quality science curriculum fosters children's natural curiosity and wonder about the world around them by asking questions making observation and exploring their environment . Our goal is to provide a science curriculum that develops the fundamental science concepts through experimental learning and practical experiments whilst embedding the skills and knowledge of science as a discipline.

Good is not enough if it can be better and better is not enough if it can be best.

AT MALIN BRIDGE PRIMARY OUR PUPILS...

Intent

For pupils to **remember key scientific facts** from the three science disciplines Biology, Chemistry and Physics.

Develop an understanding of how **scientists** approach making sense of the world around them

For pupils to develop skills to **work scientifically**.

Prepare pupils for **future scientific learning** and **careers** beyond Malin Bridge.

Scientific Concepts

The Science curriculum hinges around these 10 key scientific concepts.

The concepts have been carefully selected to ensure pupils not only remember scientific knowledge but are able to understand and develop skills and use their knowledge to work scientifically and understand science as a discipline.

Biology

- ANIMALS AND HUMANS
- HABITATS AND FOOD CHAINS
- PLANTS

Chemistry

- SOLID, LIQUIDS AND GASES
- MATERIALS

Physics

- OUR PHYSICAL WORLD
- FORCES
- ELECTRICITY AND MECHANISMS
- WAVES

WORKING SCIENTIFICALLY




Pupils develop their understanding of these concepts through meaningful examples and repeated exposure in a range of scientific contexts from EYFS to Y6, including the integrated resource. The 3D approach of the curriculum design ensures these concepts are revisited and built upon across other subjects areas in particular through *Design and Technology.* Elements of scientific knowledge and skills are reinforced, revisited and consolidated through some Design and Technology units. Over time pupils schemata will grow to develop a complex and rich understanding of these concepts.

*See the **Curriculum Booklet** for more information about the 3d curriculum.*

The breadth, depth and progression of Science at Malin Bridge has been captured within the *Science Subject Story.* This document details how the chosen Scientific areas of study, ensure all pupils develop a comprehensive understanding of the products and concepts of Science to be able to explain the material world around them.

SCIENCE AT MALIN BRIDGE

By the end of studying Science at Malin Bridge, children will be able to answer questions such as:

- Using your knowledge of **solids, liquids and gases**, explain what a reversible and irreversible change is. Use examples.
- Using your knowledge of **everyday materials**, justify the suitability of different materials for a particular use.
- Describe the similarities and differences between different **animals**, including **humans**.
- Using your knowledge of **habitats and food chains**, explain how the environment has impacted the development of animals.
- Using your knowledge of **our physical world**, how is Earth similar/different to other parts of our solar system?
- Using your knowledge of how **waves** travel, explain how sound is heard and light is seen.
- Describe how a range of **forces** affect the world around us.
- Describe the similarities and differences between different **plants**, including how they reproduce.
- Using your knowledge of **electricity** explain how a range of circuits work.
- Explain how **mechanisms** affect the forces required to act on objects.
- Using your knowledge of investigations describe of how you have worked scientifically and carried out experiments.

Breadth and Depth

All units across the curriculum ensure pupils explore Science through the repeated exposure of the key concepts: ***Plants; Solids, Liquids and Gases; Materials; Waves; Our Physical World; Forces; Animals and Humans; Habitats and Food Chains; Electricity and Mechanisms; Waves; Working Scientifically.*** This range of units ensures pupils can explore different aspects of the world around them through both substantive and disciplinary knowledge of all three scientific disciplines, Biology, Physics and Chemistry. The careful selection of which Science units will be taught where and when, develops pupils generative knowledge enabling them to learn more, do more and remember more. Each unit acts as a building block to ensure the knowledge and concepts learned directly build on previous units and lay the foundations for what pupils will go on to learn both within Malin Bridge and KS3. All Science units are aligned with the national curriculum and therefore enable children to meet the end of key stage attainment targets.

CURRICULUM CYCLE
KS1

YEAR B	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
KS1 Skills Sheets	**PETS** Topic Story	**MYTHICAL CREATURES** Topic Story	**GREAT FIRE OF LONDON** Teacher CPD Topic Story	**THE BRILLIANCE OF BREAD** Topic Story	**WEATHER** Topic Story	**ANCIENT GREECE** Teacher CPD Topic Story
Primary Focus	Art (Sculpture/collage)	Design Technology	History	Design Technology (Food)	Geography	Humanities
Secondary Focus			Geography	History	Science	Art (collage - mosaic)
English Links	My Elephant The hungry caterpillar Pet Poetry Room on the broom	Police Report/Wanted Poster Snow Dragon	Diary News Report	Instructions - Bread	Y1— Tree Seasons Y2— book Study Rapunzel	Theseus and the Minotaur - Narrative & Instructions
Science Subject Story & Glossary	Lifecycles	Materials	Forces - Friction	Health Food	Solids, Liquids, Gases - Weather	Plants
Religious Education Subject Story & Glossary	Christianity: Jesus as a friend Was it always easy for Jesus to show friendship? Discovery RE	Christianity: Christmas Why do Christians believe God gave Jesus to the world? Discovery RE	Christianity: Jesus's Teachings Is it possible to be kind to everyone all of the time? Discovery RE	Christianity: Easter How important is it to Christians that Jesus came back to life after his crucifixion? Discovery RE	Judaism: The Covenant How special is the relationship Jews have with God? Discovery RE	Judaism: Rites of Passage What is the best way for a Jew to show commitment to God? Discovery RE
Physical Education Subject Story & Glossary Fitness Games	Walking & Running	Dance Hopping, Jumping, Landing and Skipping	Balance— Gymnastics	Throwing and Catching	Athletics Bike Skills	Multiskills
Computing	**Year 1** - None **Year 2** - What is a computer? (1,2,5) Algorithms and debugging (1,2,4,5)	**Year 1** - Improving Mouse Skills (1-3) Algorithms unplugged (1,2,4,5) **Year 2** - None	**Year 1** - None **Year 2** - Data Handling (1,3,5) Programming 2: Scratch3r (1,2,4,5)	**Year 1** - Creating Media (1,2,3) Programming Beebots (1,3,4,5) **Year 2** - None	**Year 1** - None **Year 2** - Creating Media: Stop Motion (All sessions)	**Year 1** - Skills Showcase Rocket to the Moon (All sessions) **Year 2** - None
Music			Nursery Rhymes and Europe B		Around the World B	
Citizenship Sheffield Citizenship SoW Online safety Sheffield Online safety SoW	Belonging and Identity: Families B Fa4, Fa5	Diversity and Inclusion: Community C2 Anti-racism lesson 5	Health and Wellbeing: Staying Healthy P1, P2, P3	Belonging and Identity: Conflict Resolution Fr2 Anti-racism lesson 6	The Online World: Fake News and Bias Os4 Anti-racism lesson 7	Belonging and identity: Identities G1, C3 Anti-racism lesson 8
		C2— What is the internet?			N2— Scary News C3— Accepting Messages	

Knowledge in Science

Knowledge in Science is built around three subject disciplines **Biology, Physics and Chemistry**. Each discipline builds up the pupils Scientific **concepts** and **procedures** to be able to explain the material world around them. Within the Science curriculum both, **substantive** and **disciplinary** knowledge are intentionally deployed in combination with each other to ensure pupils not only know the scientific facts but they also understand the evidence for the facts and are able to use these to work scientifically.

Substantive knowledge…

Is the key conceptual and procedural facts including understanding of laws, theories, concepts and models of science in order to explain the material world.

Disciplinary knowledge…

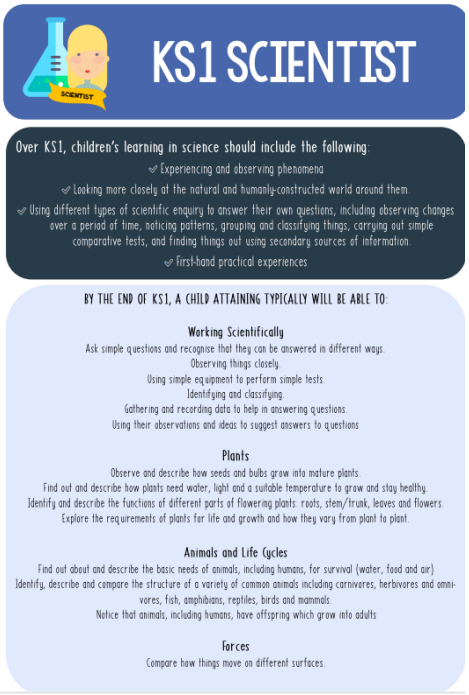
Is the practises of science and how scientific knowledge is generated and grows over time: this includes knowledge of methods; apparatus; measurements; data analysis and how scientists develop scientific explanations. This involves, but is ***not*** exclusively the practical application of experiments.

Both substantive knowledge and disciplinary knowledge are further divided into the Procedural and Conceptual knowledge.

	Substantive	Disciplinary
Conceptual *I know…*	**Liquids expand when heated for example, the liquid inside a thermometer.**	**Thermometers are used for measuring temperature and have a built in degree of uncertainty.**
Procedural *Know how to … and be able to…*	**Draw a particle diagram for a liquid**	**Use a thermometer to measure the temperature of a solution**

Skills Sheets

The skills sheets detail the **disciplinary knowledge** often referred to as 'Working Scientifically'. These include what a child who is attaining typically, should **be able to do procedurally and conceptually by the end of each phase**. They also include the key vocabulary which children should be able to use.



KS1 SCIENTIST

Over KS1, children's learning in science should include the following:

- Experiencing and observing phenomena.
- Looking more closely at the natural and humanly-constructed world around them.
- Using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information.
- First-hand practical experiences.

BY THE END OF KS1, A CHILD ATTAINING TYPICALLY WILL BE ABLE TO:

Working Scientifically

Ask simple questions and recognise that they can be answered in different ways.
Observing things closely.
Using simple equipment to perform simple tests.
Identifying and classifying.
Gathering and recording data to help in answering questions.
Using their observations and ideas to suggest answers to questions.

Plants

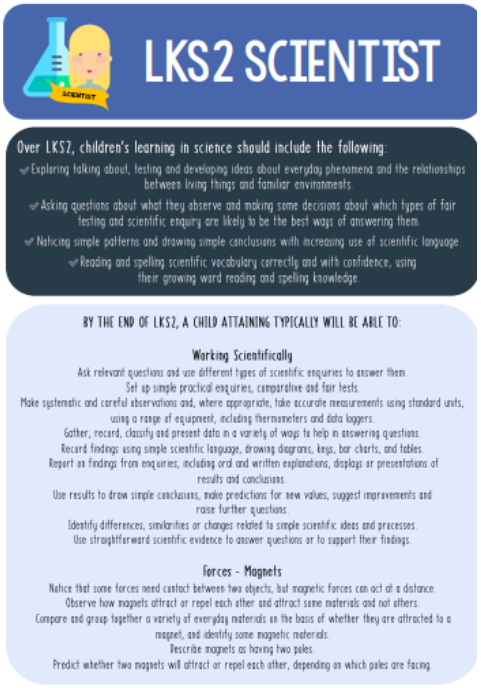
Observe and describe how seeds and bulbs grow into mature plants.
Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.
Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.
Explore the requirements of plants for life and growth and how they vary from plant to plant.

Animals and Life Cycles

Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
Identify, describe and compare the structure of a variety of common animals including carnivores, herbivores and omnivores, fish, amphibians, reptiles, birds and mammals.
Notice that animals, including humans, have offspring which grow into adults.

Forces

Compare how things move on different surfaces.



LKS2 SCIENTIST

Over LKS2, children's learning in science should include the following:

- Exploring talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments.
- Asking questions about what they observe and making some decisions about which types of fair testing and scientific enquiry are likely to be the best ways of answering them.
- Noticing simple patterns and drawing simple conclusions with increasing use of scientific language.
- Reading and spelling scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

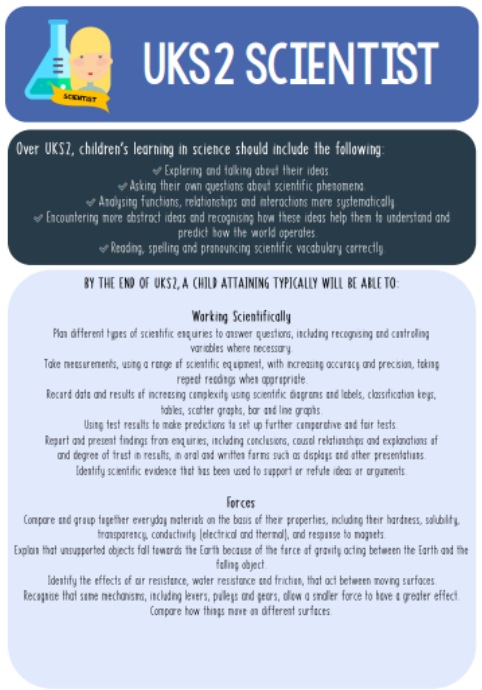
BY THE END OF LKS2, A CHILD ATTAINING TYPICALLY WILL BE ABLE TO:

Working Scientifically

Ask relevant questions and use different types of scientific enquiries to answer them.
Set up simple practical enquiries, comparative and fair tests.
Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
Gather, record, classify and present data in a variety of ways to help in answering questions.
Record findings using simple scientific language, drawing diagrams, keys, bar charts, and tables.
Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
Identify differences, similarities or changes related to simple scientific ideas and processes.
Use straightforward scientific evidence to answer questions or to support their findings.

Forces - Magnets

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.



UKS2 SCIENTIST

Over UKS2, children's learning in science should include the following:

- Exploring and talking about their ideas.
- Asking their own questions about scientific phenomena.
- Analysing functions, relationships and interactions more systematically.
- Encountering more abstract ideas and recognising how these ideas help them to understand and predict how the world operates.
- Reading, spelling and pronouncing scientific vocabulary correctly.

BY THE END OF UKS2, A CHILD ATTAINING TYPICALLY WILL BE ABLE TO:

Working Scientifically

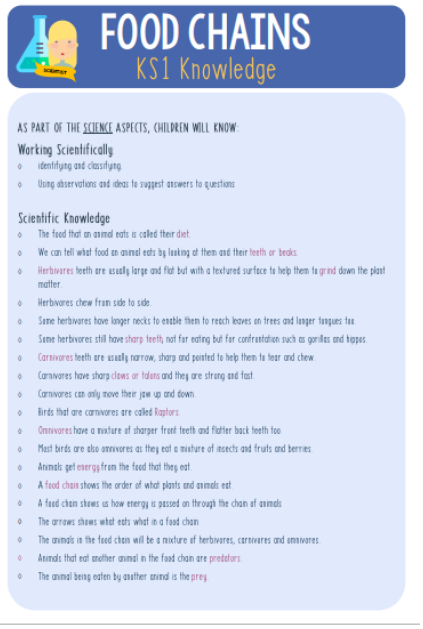
Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
Record data and results of increasing 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.
Report and present 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.
Identify scientific evidence that has been used to support or refute ideas or arguments.

Forces

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.
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.
Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
Compare how things move on different surfaces.

Knowledge Sheets

The knowledge sheet details the precise **substantive knowledge** *(both procedural and conceptual)* that pupils will be taught. The knowledge sheets also provide specific **'Working Scientifically'** and **'Experiment'** information to ensure the substantive knowledge is taught through meaningful contexts and in combination with disciplinary Knowledge.



FOOD CHAINS
KS1 Knowledge

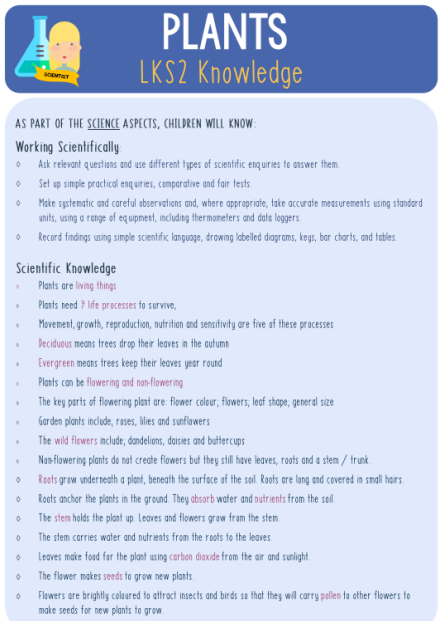
AS PART OF THE SCIENCE ASPECTS, CHILDREN WILL KNOW:

Working Scientifically

- identifying and classifying.
- Using observations and ideas to suggest answers to questions

Scientific Knowledge

- The food that an animal eats is called their diet.
- We can tell what food an animal eats by looking at them and their teeth or beaks.
- Herbivores teeth are usually large and flat but with a textured surface to help them to grind down the plant matter.
- Herbivores chew from side to side.
- Some herbivores have longer necks to enable them to reach leaves on trees and longer tongues too.
- Some herbivores still have sharp teeth, not for eating but for confrontation such as gorillas and hippos.
- Carnivores teeth are usually narrow, sharp and pointed to help them to tear and chew.
- Carnivores have sharp claws or talons and they are strong and fast.
- Carnivores can only move their jaw up and down.
- Birds that are carnivores are called Raptors.
- Omnivores have a mixture of sharper front teeth and flatter back teeth too.
- Most birds are also omnivores as they eat a mixture of insects and fruits and berries.
- Animals get energy from the food that they eat.
- A food chain shows the order of what plants and animals eat.
- A food chain shows us how energy is passed on through the chain of animals.
- The arrows shows what eats what in a food chain.
- The animals in the food chain will be a mixture of herbivores, carnivores and omnivores.
- Animals that eat another animal in the food chain are predators.
- The animal being eaten by another animal is the prey.



PLANTS
LKS2 Knowledge

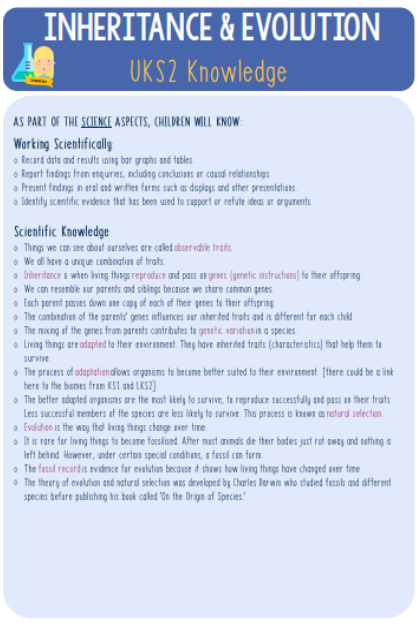
AS PART OF THE SCIENCE ASPECTS, CHILDREN WILL KNOW:

Working Scientifically

- Ask relevant questions and use different types of scientific enquiries to answer them.
- Set up simple practical enquiries, comparative and fair tests.
- Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- Record findings using simple scientific language, drawing labelled diagrams, keys, bar charts, and tables.

Scientific Knowledge

- Plants are living things.
- Plants need 7 life processes to survive,
- Movement, growth, reproduction, nutrition and sensitivity are five of these processes.
- Deciduous means trees drop their leaves in the autumn.
- Evergreen means trees keep their leaves year round.
- Plants can be flowering and non-flowering.
- The key parts of flowering plant are: flower colour; flowers; leaf shape; general size.
- Garden plants include; roses, lilies and sunflowers.
- The wild flowers include; dandelions, daisies and buttercups.
- Non-flowering plants do not create flowers but they still have leaves, roots and a stem / trunk.
- Roots grow underneath a plant, beneath the surface of the soil. Roots are long and covered in small hairs.
- Roots anchor the plants in the ground. They absorb water and nutrients from the soil.
- The stem holds the plant up. Leaves and flowers grow from the stem.
- The stem carries water and nutrients from the roots to the leaves.
- Leaves make food for the plant using carbon dioxide from the air and sunlight.
- The flower makes seeds to grow new plants.
- Flowers are brightly coloured to attract insects and birds so that they will carry pollen to other flowers to make seeds for new plants to grow.



INHERITANCE & EVOLUTION
UKS2 Knowledge

AS PART OF THE SCIENCE ASPECTS, CHILDREN WILL KNOW:

Working Scientifically

- Record data and results using bar graphs and tables.
- Report findings from enquiries, including conclusions or causal relationships.
- Present findings in oral and written forms such as displays and other presentations.
- Identify scientific evidence that has been used to support or refute ideas or arguments.

Scientific Knowledge

- Things we can see about ourselves are called observable traits.
- We all have a unique combination of traits.
- Inheritance is when living things reproduce and pass on genes (genetic instructions) to their offspring.
- We can resemble our parents and siblings because we share common genes.
- Each parent passes down one copy of each of their genes to their offspring.
- The combination of the parents' genes influences our inherited traits and is different for each child.
- The mixing of the genes from parents contributes to genetic variation in a species.
- Living things are adapted to their environment. They have inherited traits (characteristics) that help them to survive.
- The process of adaptation allows organisms to become better suited to their environment. [there could be a link here to the biomes from KS1 and LKS2]
- The better adapted organisms are the most likely to survive, to reproduce successfully and pass on their traits. Less successful members of the species are less likely to survive. This process is known as natural selection.
- Evolution is the way that living things change over time.
- It is rare for living things to become fossilised. After most animals die their bodies just rot away and nothing is left behind. However, under certain special conditions, a fossil can form.
- The fossil record is evidence for evolution because it shows how living things have changed over time.
- The theory of evolution and natural selection was developed by Charles Darwin who studied fossils and different species before publishing his book called "On the Origin of Species."

Investigations

An element of *working scientifically* includes children carrying out investigations. **'Investigation'** is the umbrella term used to encompass the **experiments** as well the **scientific experiences** children have within science lessons. The *Investigations at Malin Bridge* document outlines the clear definition between experiments and experiences to ensure pupils develop their **substantive** and **disciplinary knowledge** through purposeful and engaging activities as well as practical scientific experiments. Having a clear definition and criteria and a detailed *investigation map* for all phases across school ensures conceptual and procedural knowledge progression can be consistent, revisited and advanced upon each year.

SCIENCE INVESTIGATIONS

Scientific Investigations is the umbrella term used to encompass all of the scientific activities provided within Science lessons. These involve the process of exploring scientific knowledge and concepts through various methods and will take the form of both science experiments and science experiences.

SCIENCE EXPERIMENT

An experiment is the process of finding an answer to a question using various research methods. The purpose of an experiment is to build knowledge through observation and experimentation, gather data and to draw conclusions and find explanations. Within all phases, an experiment will involve some or all of the following criteria;

- Prediction;
- Variables
- Equipment
- Method
- Results
- Conclusion.

These will be presented either in written form, verbal form, or through teacher demonstration. The same terminology and process will be consistent across all phases.

RECORDING SCIENCE EXPERIMENTS

Scientific experiments, where age appropriate, should be written up following the set proforma. There is no expectation for all the experiments to be written up in full by the children, some elements may be written by the teacher, carried out as a guided write or presented verbally or pictorially. Each phase will focus an acquiring and mastering the recording of specific experiment criteria to embed all of these skills by the end of Year 6.

- EYFS focus - All criteria through exploration and discussion.
- KS1 Focus - Prediction and Conclusion
- LKS2 Focus - Variables and Results
- UKS2 Focus - Method, Equipment and Variables

SCIENCE EXPERIENCES

Science experiences are practical activities that enhance science lessons to deepen scientific knowledge and allow opportunities to explore and observe scientific concepts. Science experiences are activities that don't have to involve the experiment criteria. For example: *tinkering with circuits; dissecting flowers; observing the lifecycle of a butterfly or creating a fruit solar system.*

SCIENCE INVESTIGATION MAPPING

CYCLE A	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
FS2	Woodland Woodland Habitats	Animals Exploring Biomes	Dinosaurs	Wizard School Lighting up a wand	Farm Growing beans/Chick and duck lifecycle	Hot/Cold Melting ice Blowing bubble domes
KS1	Animals	Electricity Building a simple circuit Debugging circuits	Food Chains Food chain stacking cups and concertina booklets	Habitats Make a habitat Penguin water proofing / Polar Bear blubber	Senses and Hygiene Making bubble bath Growing mould on bread Germ experiment	STEM
LKS2	Rocks Making rocks out of chocolate Sifting soil samples to test for permeability	Teeth / Food Chains Explore teeth types with stones and grinding.	Plants Water Transportation Investigate what is needed for cress seeds to grow well	Habitats	Materials Investigate conductivity in a circuit Testing magnets and materials Testing paper and strength using weights and a Newton meter.	STEM
UKS2	Lifecycles and Classification Investigating eggs Making yeast grow	Space Fruit solar system Phases of the moon demonstration Chocolate buttons test	Inheritance and Evolution Bird beak challenge Marshmallow monsters Natural selection - balls	Light Light alleys Periscope Making shadows bigger	STEM– materials and reactants Message detective–chromatography Fruit volcanoes & Crushing cans Prevent a nail from rusting Pickled apples– decay	Diet and Exercise Exploring food labels

**EXPERIMENTS

EXPERIMENT
KS1 - example

WHICH MATERIAL CREATES THE MOST FRICTION?

Prediction - What do I think will happen?

I think...

I think this because...

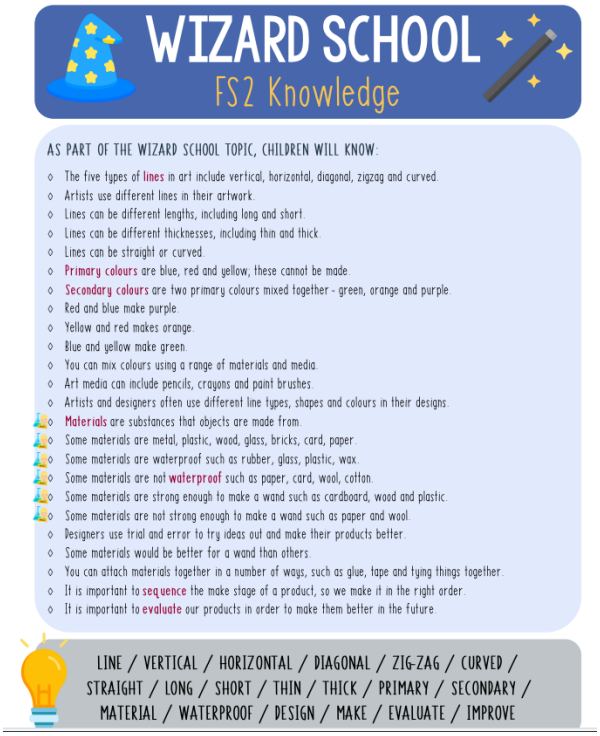
Variables - What will change? What will stay the same? How can we make it fair?

- ☑ I will change the material on the ramp
- ☑ I will measure the distance the car travels from the same starting point.
- ☑ I will keep the same car and same height of ramp

Equipment - What will we need?

- ☑ Materials - sandpaper/carpet/bubble wrap/wood/tinfoil/cardboard
- ☑ Car
- ☑ Ramp
- ☑ Pencil and stickers
- ☑ Tape measure

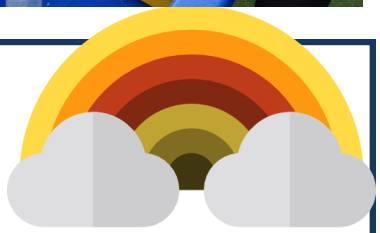
Experiments include the following criteria: **Prediction; Variables; Equipment; Method; Results and Conclusion.** However, each phase focusses specifically on a key areas to master to ensure pupils leave Malin Bridge secure in their conceptual and procedural knowledge of carrying out a scientific experiment. The experiment documents for each phase provide a detailed example of what a recorded experiment looks like with consistent supporting images and vocabulary.



Science in the Early Years

Pupils in FS1 (Nursery) and FS2 (Reception) participate in Science activities through a combination of teacher led activities as well as activities and experiences providing within the continuous provision. The continuous provision provides the opportunity to reinforce their knowledge through exploration and meaningful play to support them to progressing towards the *Early Learning Goal Knowledge and Understanding of the World and Communication and Language*. The scientific aspects and knowledge to be taught within each topic within EYFS, is identified on the knowledge sheets to ensure the development and progression of scientific knowledge and concepts.

Adaptations for SEND



The science curriculum remains ambitious and aspirational for all pupils with SEND and the focus is on adapting how the scientific knowledge, concepts and language are delivered and accessible for all. There is a focus on pre-teach, communicate in print resources and knowledge organisers for new vocabulary, knowledge and concepts with extra opportunities for discussion and Kagan work to ensure time is given to process new learning. The collaboration of teachers and special educational needs staff ensures pupils' individual needs are met whilst maintaining an effective educational experience.

See the **SEND** booklet for more information.

Y4 Science Assessment Guidance

Key Questions

Materials

Describe the properties of some materials. What does electrical conductor and insulator mean? Can you give some examples of them both? What are renewable and non renewable energy sources? Why is sustainability important?

Solids Liquids and Gases - Water Cycle

What are the 3 states of matter on earth? What are states of matter made up of? Describe the differences between he particles in Solids, liquids and gases. How do stages change from one stage to another? How have scientists used their knowledge of states f matter to discover the stages of the water cycle?

Digestion

Where do plants and animals et their energy from? How can food contribute to our bodies being healthy? Why do we need to eat a balanced and healthy diet? What are the benefits of the different food groups for our bodies? How does the body di-gest food? What organs are involved in the process and what do they do?

Working Scientifically

Describe some labelled diagrams you have used in science lessons. What is the purpose of a results table? Why do scientists make predictions? Describe some measurements you have taken and what equipment you used. Why did you choose that equipment? Describe an experiment you have undertaken. What do you understand about variables and fair testing?

Year 4 Attainment Target

Children attaining typically will broaden their scientific view of the world around them through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and will begin to develop their ideas about functions, relationships and interactions.

Biology: *Pupils will be able to identify parts and functions of a flowering plant and understand what they need to survive. Be able to describe how water is transported in plants and the process of pollination. Pupils will be able to understand the important of nutrition and healthy balanced lifestyle. Pupils will that living things can be grouped in a variety of ways and understand how to use classification keys. They will be able to explain how environments can change and how this affect living things. They will have an understanding of the digestive system in humans and know the functions of teeth. Pupils will be able to interpret food chains and use appropriate vocabulary associated with them.*

Y4 Science Assessment Guidance

Chemistry: *Pupils will be able to compare and group different kinds of rocks and describe how fossils are formed. They will recognise that soils are made from organic matter. and compare a group of everyday materials and recognise some common insulators and conductors. Pupils will be able to explain how states of matter can be changed and how this links to the water cycle.*

Physics: *They will be able to identify how sounds are made associating this with vibrating, how sound travels and patterns between pitch and volume. They will be able to observe how magnets attract and repel each other . Pupils will be able to recognise the components of a simple circuit and understand how a complete circuit works including how circuits are presented in diagrams.*

Working Scientifically: *Pupils will raise questions about the world around them and make some decisions about the most appropriate type of scientific enquiry. They will be able to recognise what a simple fair test is and why its necessary. They will be able to talk about grouping, sorting and classifying and use simple keys. They will be able to look for patterns and decide what data to collect , what observations to make and know types of equipment that can be used. They will be able to take measurements using equipment and record information in simple tables. They will be able to analyse results identify patterns and draw simple conclusions. They will be able to make predictions and find ways to improve what they have already done. They will be able to refer to secondary sources to answer questions and use relevant scientific language to discuss their ideas and communicate their finings in a variety of ways.*

Key Vocabulary

Children working at ARE should be able to use the following vocabulary confidently and consistently:

ROOTS, STEM, TRANSPORT, LIFE CYCLE, POLLINATION, NUTRITION, DIGESTIVE SYSTEM, CANINES, MOLARS, PRODUCERS, PREDATORS, ATTRACT, REPEL, CONDENSATION, EVAPO-RATION, VIBRATION, CIRCUIT, CHANGES IN STATE, FOSSILS

Children working at a PITA 3 will be able to do the majority of the above statements with support.

For children working above PITA 4, please see the Y5 attainment targets.

For children working below a PITA 3, please see the Y3 attainment targets.

Assessment: *The Impact*

To help staff make a **summative assessment** of pupils scientific knowledge, there are year group Science Assessment Guidance sheets. These outline the substantive, and disciplinary knowledge that a child is expected to achieve by the end of each school phase. They also include appropriate concept questions to support teachers to assesses how well pupils can explain their understanding of the Science as a discipline. The assessment sheet details an attainment descriptor of what a typical attaining child should be ato achieve by the end of each year. These, along with the knowledge sheets and skills sheets, help teachers to make their judgement.

A range of **formative assessment** strategies are used to help teachers to reshape the learning to meet the needs of all pupils in their class and ensure the pitch of the lesson is appropriate.

See the Responsive Teaching section and the Impact section of the Curriculum booklet for more information.

Other booklets for consideration

Curriculum / EYFS/ DT

Appendices

(available on request)

Science Subject Story

Science Skills and Knowledge Sheets

Science Investigation Document and Mapping

Malin Bridge Primary School

Chorus Education Trust