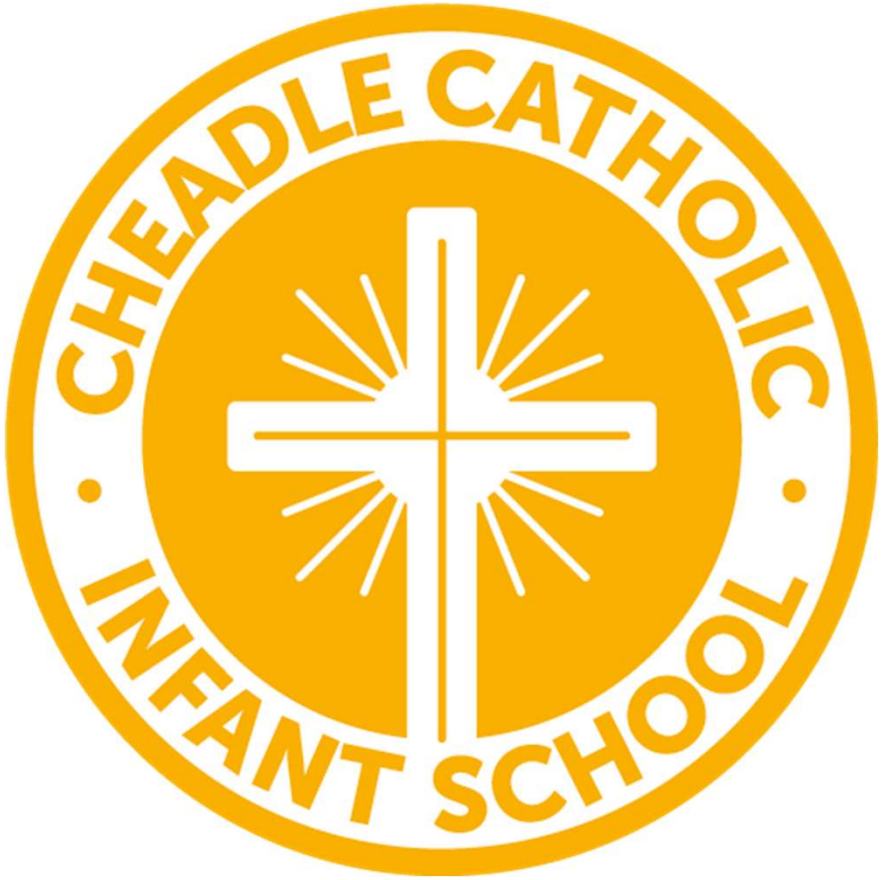


SCIENCE IN OUR SCHOOL

By Belinda Brennan-Sweeney

OUR VISION – *LOVE, RESPECT, SHINE*

At Cheadle Catholic Infant School we encourage our children to show love and respect for themselves and others and to shine brightly in all that they do.

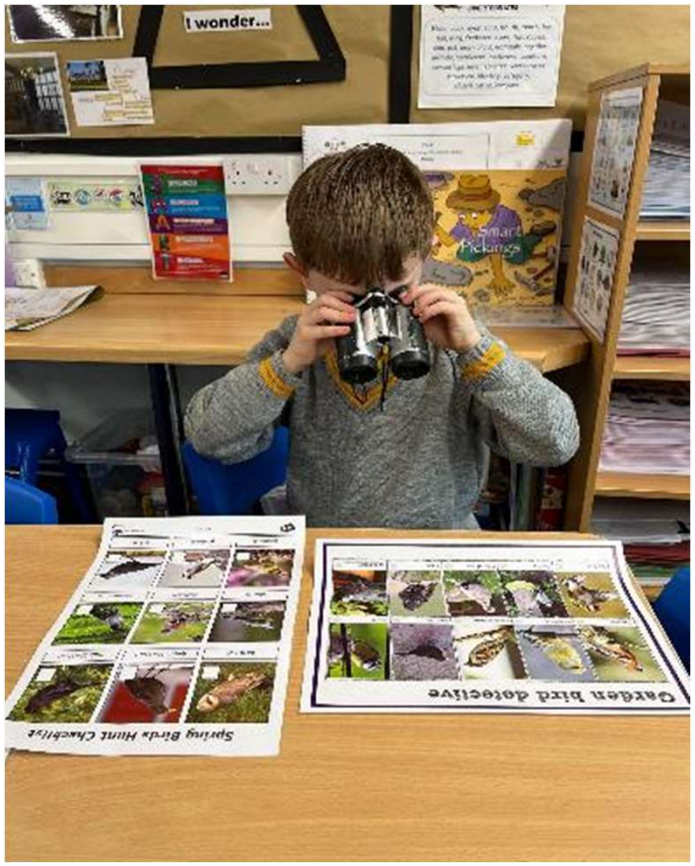
Science plays an important part in this because:

Science is a unique way of observing the world by watching, listening, observing, and recording that can inspire and motivate children. Science is like a mystery inviting anyone who is interested to become a detective and join in the fun. (Love)

Science is curiosity in thoughtful action about the world and how it behaves. It shapes the technology in society we live in. The teaching of science enables children to better understand the world they live in. (Respect)

At Cheadle Catholic Infant School, we provide opportunities for all children to develop a love of science as they engage in a variety of experiments, learning scientific skills, enhancing their scientific vocabulary and thinking like scientists. (Shine)

SCIENCE OVERVIEW



At Cheadle Catholic Infant School our vision is to give the children a Science curriculum which enables them to explore and discover the world around them, confidently, so that they have a deeper understanding of the world we live in.

Staff at Cheadle Catholic Infant School are responsible for providing a curriculum that is broad, balanced, flexible, stimulating, relevant, inclusive and well planned.

Our comprehensive curriculum has been designed with the needs and experiences of our children in mind. It has been developed in line with the EYFS framework and National Curriculum.

Our bespoke curriculum enables children to make a significant contribution to their school community and the wider world and supports and develops effective transition. It draws on the local environment and the children's own experiences and is unique to our school and its location.

Our Scheme of Work is rigorously delivered to ensure that all children are given the best possible chance to succeed and develop the skills and knowledge they will need to enjoy and achieve at the end of Key Stage 1 and beyond.

SCIENCE INTENT

To achieve our intent, the teaching of Science involves exciting, practical hands-on experiences that encourage curiosity and questioning. All of this equips our pupils with a breadth of knowledge and skills that are underpinned by our Mission statement.

We will inspire our children by giving them the opportunities to pursue their natural curiosity; promoting the experience of exploring and investigating scientific phenomena, in a range of contexts, to ensure a continually evolving knowledge and understanding of the world around them.

Our children will be encouraged to ask questions, take risks, experiment, reflect and learn from mistakes, in a safe environment; whereby they acquire and apply core skills which equip them for an ever-changing world.

Regular events take place to instil the curiosity of science from a young age, including visiting scientists, trips, Science weeks, cross-curricular events (i.e. with Forest School/Geography) and extra-curricular activities sent home when involved in a national event.

TOPICS COVERED IN SCIENCE

EYFS

- All about me
- Seasons
- Superheroes (materials)
- Mini beasts and growing plants
- Space
- The natural world (contrasting environments)

- Working Scientifically- throughout all year groups

Year 1

- My body and my senses
- Materials
- Polar places
- Plants and animals where we live
- On Safari (animals)
- Seaside summer holidays

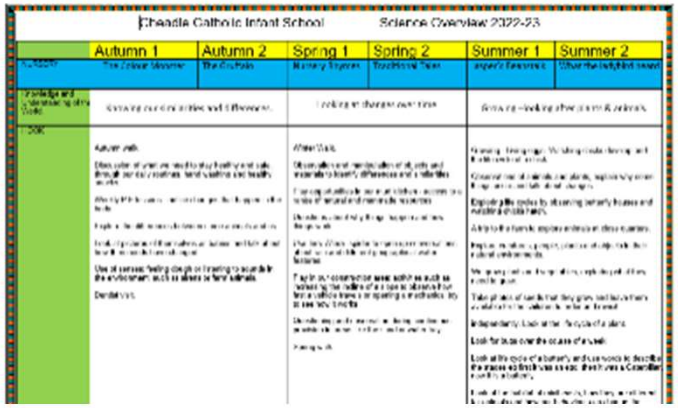
Throughout the year – Seasonal Change

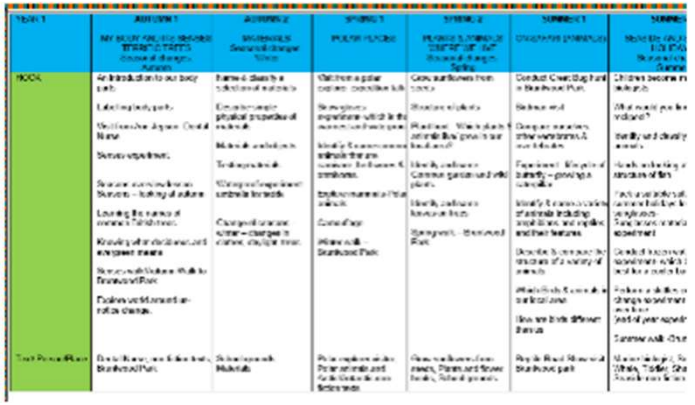
Year 2

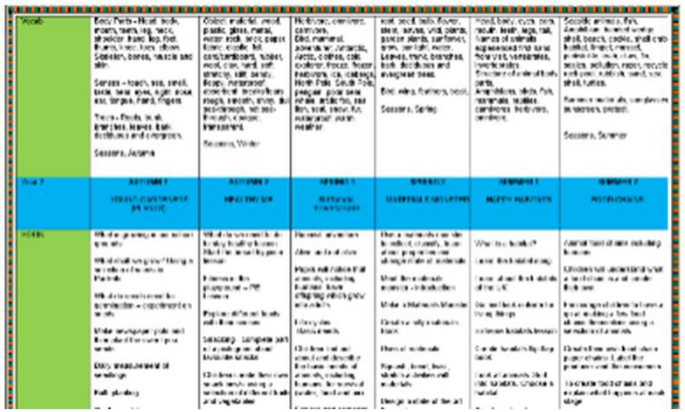
- Young Gardeners (plants)
- Healthy Me
- Animals (including humans) and Living Things
- Materials/ Squash, Bend, Twist and Stretch
- Happy Habitats
- Food Chains

PLANNING SCIENCE – WHOLE SCHOOL SUBJECT OVERVIEW

- The subject overviews layout the different aspects of each topic across the school year for each year group.
- This provides a complete view of what will be taught and when.







HOW IS LEARNING SEQUENCED ACROSS THE SCHOOL?

- Learning is sequenced based on suitability with the wider curriculum (what other topics are being taught in other subjects) and other factors such as the seasons. Eg, Nursery/Reception and Year 1 complete the 'plants' unit in the Summer term to coincide with seasonal changes. Year 2 complete their 'plants' topic in the Autumn term to compare change, all add progressive pedagogy to their previous knowledge.
- National Curriculum objectives and the Early Years Foundation Stage Statutory Framework form the basis of a bespoke curriculum at our school.
- As Science leader I have produced a bespoke scheme of work which lays out how science will be taught across the entire school.
- Progressive learning is identified in a yearly overview document.
- Progression is built in via:
  - Working scientifically- disciplinary knowledge
  - Prior and future learning- substantive knowledge
  - Vocabulary
- Medium term plans are written for each year group in every topic.
- Sequential weekly plans follow on from this.

WE FOLLOW THE NATIONAL CURRICULUM LEARNING OBJECTIVES AND THE EYFS STATUTORY FRAMEWORK TO PRODUCE A BESPOKE CURRICULUM.

Science Overview

Summer 2A – Polar Places

	Week 1	Week 2	Week 3	Week 4	Week 5	Weeks 6
Topic	Polar Places	Polar Explorer	Snow Gloves	Polar Animals	Animals	Camouflage
Science Polar Places	At the beginning of this topic, we use Google Earth to take children on a journey to a polar region, e.g. Antarctica. Introduce the topic using PowerPoint Slides 1–8. Give children access to video clips, posters, books, etc. about the polar regions.	As a primary source of information, an Arctic explorer visits the school and explains what an explorer needs for an expedition. Children then report their choices using secondary sources of information such as books and the Internet to further scientifically research what a polar explorer needs. Use PowerPoint Slides 9 to 11 to introduce the topic of clothing and explorers.	Children design gloves for their expedition and test gloves that are provided to see if they are warm and waterproof. We consider which materials would make the best snow gloves and discover the differences between waterproof and non-waterproof materials. Provide children with a wide variety of gloves, which they can explore by trying them on, discussing them with their classmates and classifying them, e.g.: Flexible: We can move our hands easily. Waterproof: Our hands stay dry Warm: Our hands stay warm.	In order to expand our knowledge of animals we look at polar animals – and categorise which are herbivore, carnivore or omnivore. For example, they learn how polar bears eat seals, and seals eat fish.	Using the ability to categorise we look scientifically at a variety of common animals we identify and classify a variety of common animals into herbivore, carnivore and omnivore.	We learn about animals camouflaging and perform a simple investigation: how do you know that an animal is camouflaged and how would you perform a test to check?
Activities	3.3.1 – Activity 1 – Polar Places	3.3.1 – Activity 2 – Planning a Polar Expedition	3.3.1 – Activity 7 – Snow Gloves	3.3.2 Activity 2 – Am I herbivore etc	3.3.2 Activity 3 – the Big Freeze	3.3.2 Activity 4 – Camouflage

A scheme of work and medium term plans are created for each individual topic across the whole school.

TOPIC: Polar Places

this topic combines different topics of the national curriculum: Animals, Materials, Changing Seasons, scientists

Most children should be able to:

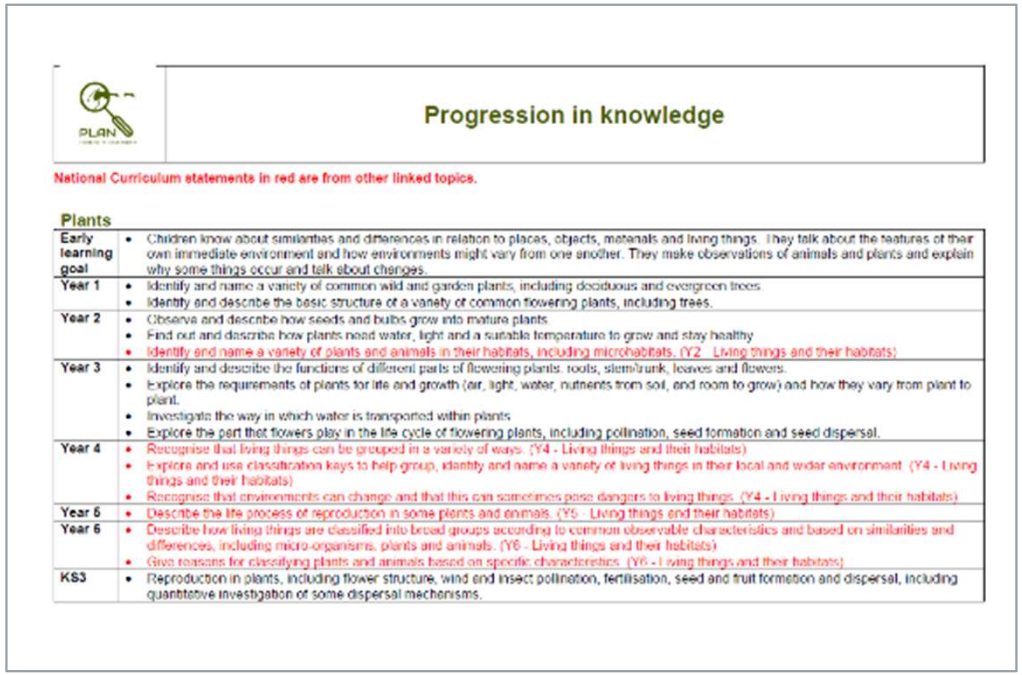
- choose clothes for an expedition explaining their choice.
- describe the materials and their properties.
- can sort materials using their senses
- use their senses to describe the properties of materials, e.g. rough, smooth.
- name some animals and can say if it has fur or feathers.
- sort the animals by their observable features and may say which eat other animals, e.g. polar bear.
- can say what animals eat, e.g. meat or plants.
- can name animals and describe where they live and what they eat.
- name a range of animals and can talk about obvious differences, e.g. beaks, legs, fins.
- sort animals into carnivore, herbivore and omnivore and can say what each animal eats.
- identify and classify materials, e.g. coat, scarf, and are able to say why they have been chosen, e.g. coat keeps me wa
- sort pictures into appropriate groups and explain their choices.
- identify materials clothing is made from.
- can identify, name and classify different materials into groups using their senses.
- know properties such as stretchy, bendy, waterproof.

STATUTORY REQUIREMENTS	KEY QUESTIONS
• Identify and name a variety of animals including fish, amphibians, reptiles, birds and mammals. • Identify and name common animals that are carnivores, herbivores and omnivores. • Describe and compare the structure of a variety of common animals. • Describe the simple properties of a variety of everyday materials. • Compare and group together a variety of everyday materials on the basis of their simple properties.	• Why do you think people go on expeditions? • Where would you like to visit on an expedition? • What special things would you need to take with you? • How would you test gloves to find out which were best for a polar explorer to wear? • How do polar animals keep warm? • Which polar animal is the biggest? • Which polar animals would you like to see? Why? • Why are some polar animals white? • a polar bear is a carnivore, so why does it need to be camouflaged?

KEY CONCEPTS AND BIG IDEAS

In EYFS and Key stage 1 it is important that children encounter important concepts and ideas in an age-appropriate way. The science curriculum at our school is carefully designed to make sure that the concepts the children are introduced to set them up for success throughout our school and into Key Stage 2, creating a firm foundation for scientific understanding.

Key Concept	What it means	How will understanding of the concepts progress over time	Where it appears in our curriculum
Working Scientifically Note this is a threshold concept which once understood, modifies learners' understanding of a particular field and helps them to make progress.	'Working scientifically' involves the processes of science, including understanding the sorts of questions that are answered by science; the design of experiments; reasoning and arguing with scientific evidence; and analysing and interpreting data.	Thinking like scientists Types of scientists Types of scientific enquiry Choosing suitable experiments Presenting results and drawing conclusions	Year 1 – across every topic we introduce and reinforce the different types of scientific enquiry. See the scheme of work for more details. We also talk about polar explorers and marine biologists and in science week introduce other scientists Year 2 – year two extends scientific enquiry by getting children to choose appropriate types of enquiry and to be able to present their findings better
Animals	A living organism which can be grouped into different types – of which humans are one - and can move, breath, and reproduce and need to consume food to survive.	Identification of animals Classification of animals Humans as animals Requirements for growth and life Related senses	EYFS – all about me: my body, identifying animals, counting legs and where they live in a minibeast hunt, lifecycle of butterfly and frog. Year 1 – Carnivore, Herbivore, camouflage, polar animals, my body parts, Senses Sense experiment. Insects, reptiles, vertebrates and invertebrates. Classifying seashore animals. Year 2 – healthy me: exercise, food. Habitats and food chains Basic needs of animals. Birdwatching, minibeast hunt.
Plants	a living organism which can also be classified (such as trees, garden plants, wild plants), typically growing in a permanent site, absorbing water and substances.	From identification of trees and plants to planting seeds and bulbs and measuring growth. We need plants to keep us alive- they produce oxygen.	EYFS - Grow broad beans. What a plant needs to grow, label basic parts of a plant. Year 1 – trees, evergreen and deciduous. Structures of plants and trees, garden plants, wild plants. Year 2 – identifying plants in school grounds, planting and measuring seeds, growing bulbs.
Materials	Materials are the matter or substance that objects are made from. We use a wide range of materials daily for different objects and purposes depending on a material's properties.	Grouping objects according to the material they are made from Sorting materials according to their properties such as hard/soft objects Matching an object to the material it is made from Matching a material to a purpose Matching a material to a description	EYFS – test if objects float or sink, boat materials to build a boat. Year 1 – naming, objects and materials, properties, sorting: Children will differentiate between an object and what it is made from They learn to identify a range of different materials They will practise describing what the material is like (for example hard/soft or rough/smooth) Year 2 - Children explore the purpose and appropriateness of different materials for specific tasks. For example, which material would be best to make a pillow? Make a materials monster. Investigate how some materials can bend, stretch, twist and squash
Change	A process through which something becomes different. For example, seasonal change makes our environment different, animals and people change as they grow, material properties can change.	Seasonal change Properties of materials change due to heat, cold, being put in water	EYFS - lifecycle of a butterfly and frog. Year 1 – winter (change of clothes, length of daylight and changes to trees) Summer, materials properties. Year 2 – freezing and unfreezing food Squash, bend, twist and stretch materials

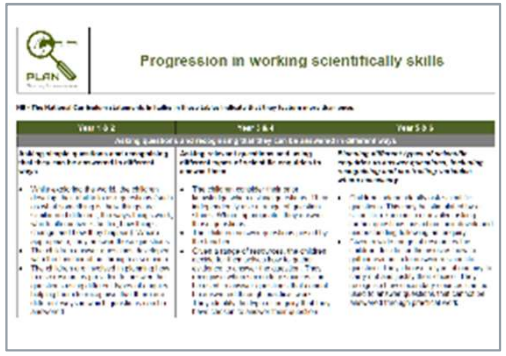


Progression in knowledge

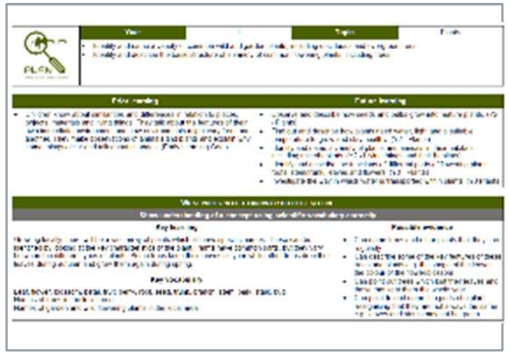
National Curriculum statements in red are from other linked topics.

Plants

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	• 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.
Year 2	• 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 name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)
Year 3	• 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. • 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.
Year 4	• Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats) • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats) • Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	• Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
Year 6	• 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. (Y6 - Living things and their habitats) • Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
KS3	• Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.



Progression in working scientifically skills



ENSURING SCIENCE PROGRESSION

- We use PLAN, which is a formal framework, to address:
  - Knowledge progression
  - Working scientifically progression
  - Common mis-conceptions
  - Choosing activities wisely
- PLAN provides the starting point for this and make it clear what pupils should have learnt and what they will learn next year.
- Additionally, we select suitable activities and include National Curriculum keywords in Knowledge Organisers that are used by all staff.
- We always check what the previous year learning should have been and address any gaps.
- We challenge the children to make sure they have understood it!
  - We plan first at a high level the different topics: and then use that to create the Schemes of Work and medium-term plans. This ensures full coverage, coherence and progression from year to year.

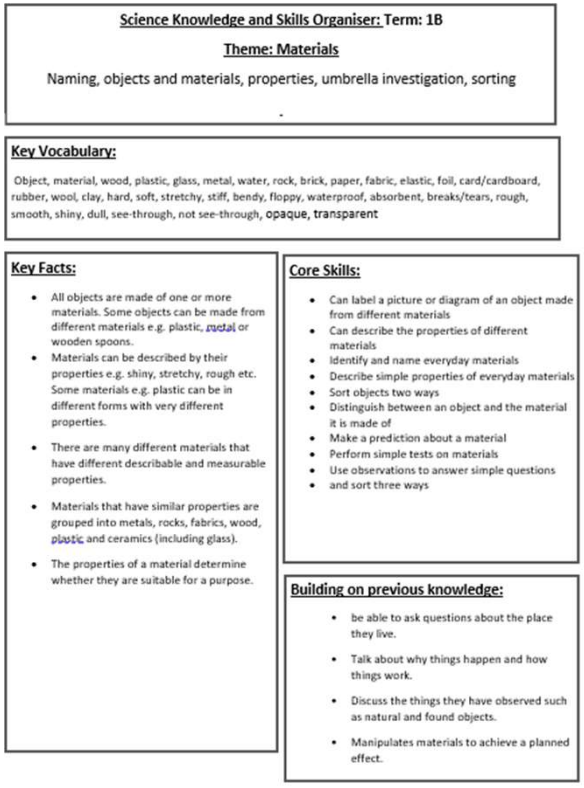
PROGRESSION OF VOCABULARY AND KNOWLEDGE

Clear Knowledge Organisers

- Outline how each topic is built upon in each year group.
  - Teachers have a clear understanding of what has been covered in previous year groups from the knowledge organiser.

Topic Cover Sheets

- Children are able to see what vocabulary they need to learn in their topic cover sheets.
- These are also displayed in classrooms on the science display.



Science Knowledge and Skills Organiser: Term: 1B

Theme: Materials

Naming, objects and materials, properties, umbrella investigation, sorting

Key Vocabulary:

Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through, opaque, transparent

Key Facts:

- All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons.
- Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties.
- There are many different materials that have different describable and measurable properties.
- Materials that have similar properties are grouped into metals, rocks, fabrics, wood, plastic and ceramics (including glass).
- The properties of a material determine whether they are suitable for a purpose.

Core Skills:

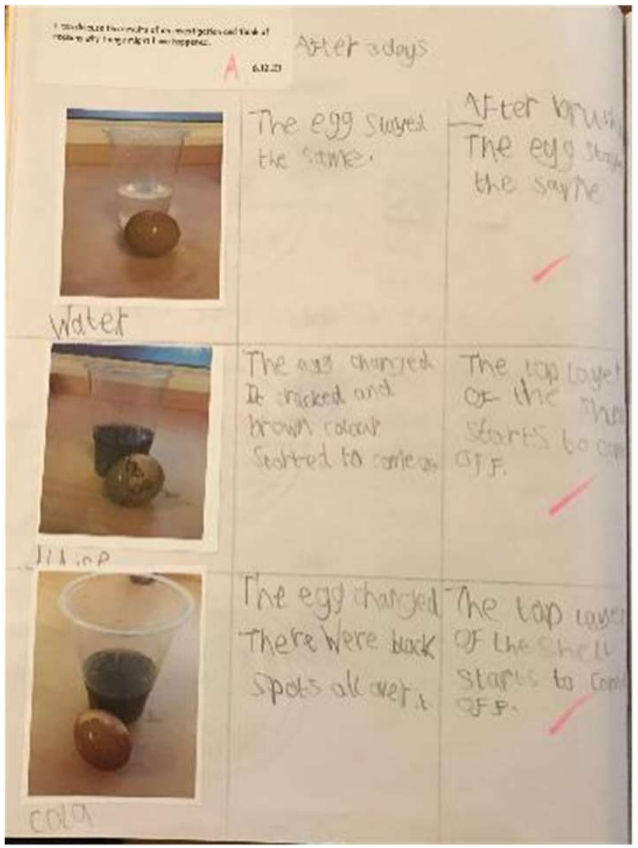
- Can label a picture or diagram of an object made from different materials
- Can describe the properties of different materials
- Identify and name everyday materials
- Describe simple properties of everyday materials
- Sort objects two ways
- Distinguish between an object and the material it is made of
- Make a prediction about a material
- Perform simple tests on materials
- Use observations to answer simple questions and sort three ways

Building on previous knowledge:

- be able to ask questions about the place they live.
- Talk about why things happen and how things work.
- Discuss the things they have observed such as natural and found objects.
- Manipulates materials to achieve a planned effect.

PROGRESSION OF WORKING SCIENTIFICALLY

- Throughout Cheadle Catholic Infant School, children will explore the 5 types of scientific enquiry types which builds on their subject-knowledge and working scientifically skills:
- Fair and Comparative Testing
- Pattern Seeking
- Changes Over Time
- Secondary Sources
- Identifying, Classifying and Grouping.
- 'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group and this is embedded within lessons and focuses on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions.



ENSURING COVERAGE OF SCIENTIFIC SKILLS ACROSS THE YEARS

Examples of how this is planned can be seen here – ensuring coverage of working scientifically skills across the year groups and within each activity.

Example – What type of gloves keep hands warm -

	Ask scientific questions	**Plan an enquiry**	**Observe closely**	**Identify and classify**	**Take measurements**	**Gather results**
Classification						
Research	Google What factors might affect warmth? Thickness? Type of material?					
Comparative Fair Test		Sort gloves into thick material and thin material Do a test Then sort into wool or cotton and repeat the test?	Put hands into ice bucket for 30 secs and		On a sticker put the type of gloves and what the warmth was like	
Observation over time						
Pattern seeking	Do thickness and material make gloves warmer?			Kids say "very warm" "quite warm" or "cold" or "very cold" gloves		Put stic a chart four sq saying warm, cold, very cold etc

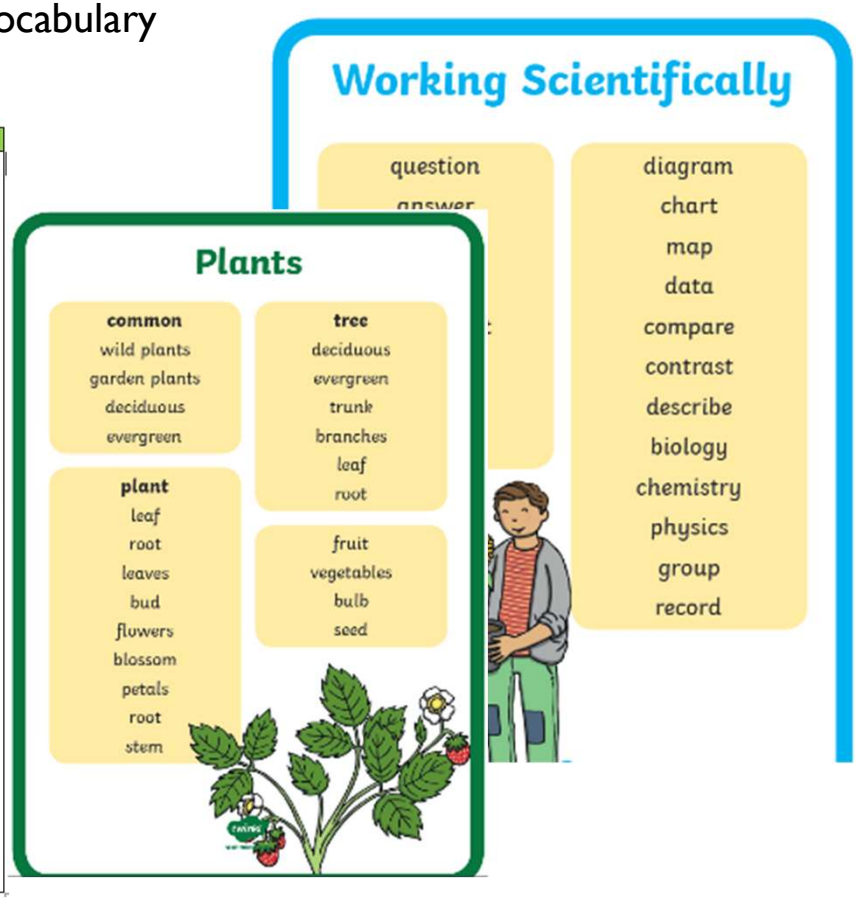
Year 1

Topic	Developing skills in comparative tests	Identifying and Classifying	Observing over time	Develop Children's skills in Pattern Seeking	Develop children's skills in 'research'	Devise a test
1A My Body	Is our sense of taste better when we can't smell? Are our eyes the sense we use most in school? Tally sheet	What are the names for all the parts of our bodies? Food tasting – what are bitter, sweet etc	How does my height change over the year? What happens to leaves on deciduous and coniferous trees over time?	Can you recognise deciduous and coniferous trees by their leaves? Is there a pattern to how fruits taste? Eg, all sweet (food tasting)	Do all animals have the same senses as humans?	
1B Materials	Which materials are the most waterproof? Which materials are the most absorbent?	identify, sort and group materials based on their properties? We need to choose a material to make an umbrella. Which materials are waterproof? Which materials will float and which will sink?	If we drop water onto cloth what happens in the end?	Object Challenge Activity Sheet. What have all the objects got in common? Is there a pattern in the types of materials that are used to make objects in a school?	How is an umbrella made? Which materials can be recycled?	Model how to test to see if something is waterproof, transparent or opaque or absorbent
2A Polar Places	Snow gloves – which are the most flexible and warm	Sort different pictures of places and classify them Sort clothes into useful and non useful clothes Sort animals into herbivores and carnivores	If you leave your hands in ice longer do they get colder?	Is there a pattern in what are useful clothes for a polar expedition? (eg, woolly) What types of animals need to be camouflagued?	What does a polar explorer need for an expedition?	How would you test which gloves are the warmest? How could we test whether animals are camouflaged in school grounds
2B Plants and animals where I live	Which are the most common wild plants in the school grounds?	Identify garden plants Identify wild plants Identify birds	How does my sunflower change each week?	Is there a pattern in where we find moss growing in the school grounds? (Plant hunt)	How are the animals in Australia different to the ones that we find in Britain? At home? What are the most common British plants and where can we find them?	

OTHER MATERIALS WE USE EG, WORKING SCIENTIFICALLY POSTERS AND VOCAB POSTERS

Vocabulary list for EYFS and KS1 to help class teachers signpost key vocabulary to the children and ensure progression and repetition across school.

Science	Working Scientifically	Materials	Change	Plants	Animals inc Humans
Vocab	**Year 1:** Identify, classify, sort, Group, record, compare, contrast, Research, investigate, scientific enquiry comparative and fair test, observation, measurements, equipment, secondary sources **Year 2:** Plan, variables, Measurements, Accuracy, scientific diagrams, labels, keys, tables, graphs, predictions, further comparative and fair test, report and present conclusions, explanations, evidence, identify, classify, describe patterns, measurements	**EYFS:** Pull, Push, material, magnetic, not magnetic, waterproof, not waterproof, float, sink **Year 1:** Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through, opaque, transparent **Year 2:** Names of materials, objects, properties, uses of materials, opaque, transparent, translucent, reflective, non-reflective, flexible, rigid, Shape, push/pushing, pull/puling, twist/twisting, squash/squashing, bend/bending, stretch/stretching	**EYFS:** Seasons, spring, summer, autumn, winter, weather **Year 1:** Seasons, spring, summer, autumn, winter, windy, sunny, overcast, snow, rain, weather, daylight, day length, temperature, clothing, , sun safety, caterpillar/butterfly, spawn/tadpole/frog, reduce, reuse, recycle **Year 2:** changes relating to animal lifecycle and humans, reproduction, growth, child, young/old stages (examples baby/toddler/child/ teenager/adult)	**EYFS:** grow, stem, leaf, root, soil, sunlight, water, plant, bean, seed **Year 1:** grow, Leaves, root, seed, bulb, flower, stem, blossom, petal, fruit, berry, stalk, bud, wild, garden, tree, deciduous, evergreen, trunk, branch, bark, trunk, branch, soil, sunlight, water, plant names, tree names. **Year 2:** Leaves, trunk, branch, root, seed, bulb, flower, stem, wild, garden, deciduous, evergreen, observe, growth, compare, record, temperature, predict, measure, diagram, germinate, warmth, sunlight	**EYFS:** mini beast, life cycle, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly) **Year 1:** Body parts neck, shoulder, hand, leg, foot, knee, toes, elbow, Senses: touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue, sight, hearing, Animal structure, amphibians, mammals, reptiles, fish, bird, carnivores, herbivore, omnivore **Year 2:** Offspring, reproduction, growth, exercise, heartbeat, breathe, respire, healthy, diet, living, dead, never been alive, basic needs, food, food chain, germs, nutrition, excrete, shelter, move, feed, habitat, microhabitat, ocean, forest, woodland, prey, predator, consumer, producer, environment.



OUR RATIONALE DOCUMENT SUMMARISES THE OVERALL PLAN AND DESCRIBES WHAT WE DO

This comprehensive and bespoke curriculum has been designed with the needs and experiences of our children in mind and ensures that all children are given the best possible chance to succeed and develop the skills and knowledge they will need to enjoy and achieve at the end of Key Stage 1 and beyond. It draws on local inspiration and the children's own experiences and is unique to our school.

This Rationale accompanies the school science policy and explains in more detail the activities undertaken during each year group and the reasons for doing them, and where necessary relates this to the National Curriculum.

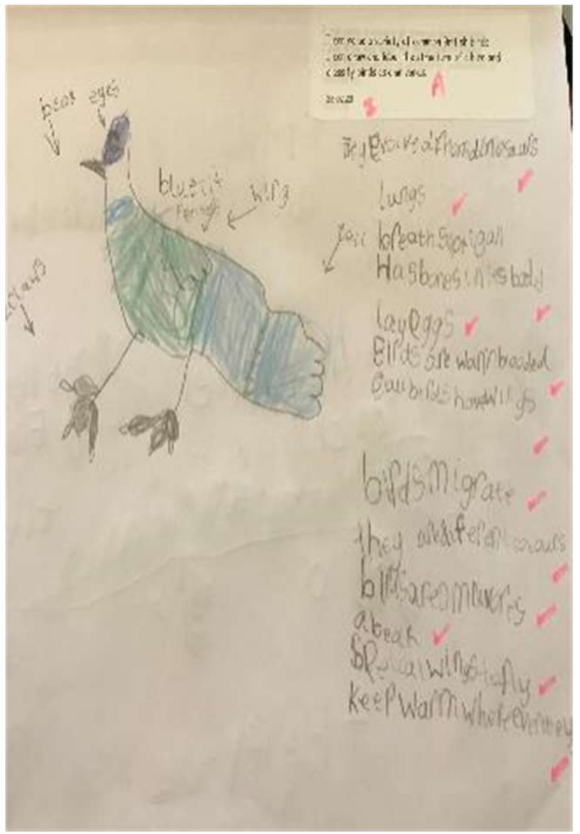
The document is designed to be read to gain an insight into what children will do on a weekly basis and how our science program will grow their scientific knowledge and vocabulary.

In Year 1 our approach matches that of the National Curriculum and in each term we look scientifically at the relevant season.

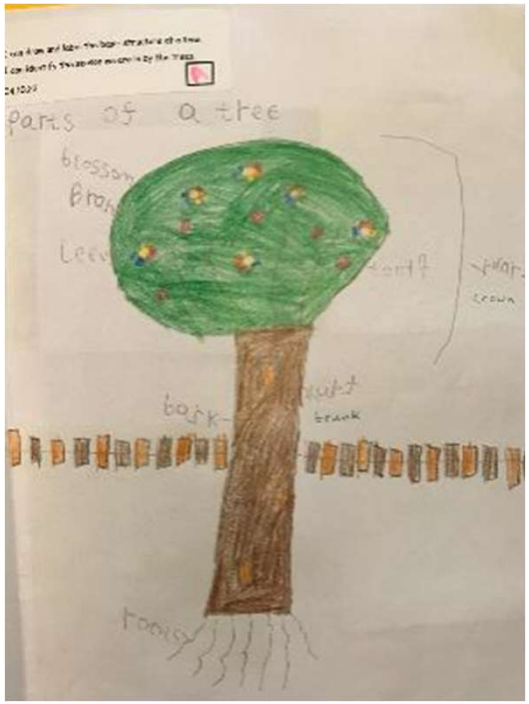
'Seasonal Change' is covered every term and **'Working Scientifically'** is covered throughout each topic.

<u>Autumn</u>

The first half of autumn involves looking at the features of autumn and comparing it to the summer just passed.



This document can be found in full on the school website.



HOW ARE LESSONS STRUCTURED?

- In each lesson we start with the learning intention, prior learning and ask "Can you still…?"
- We have a whole class teaching activity for each lesson with a follow up independent activity.
- We have a stretch and challenge extension exercise before the plenary "Can you now…"?

Foundation Planning

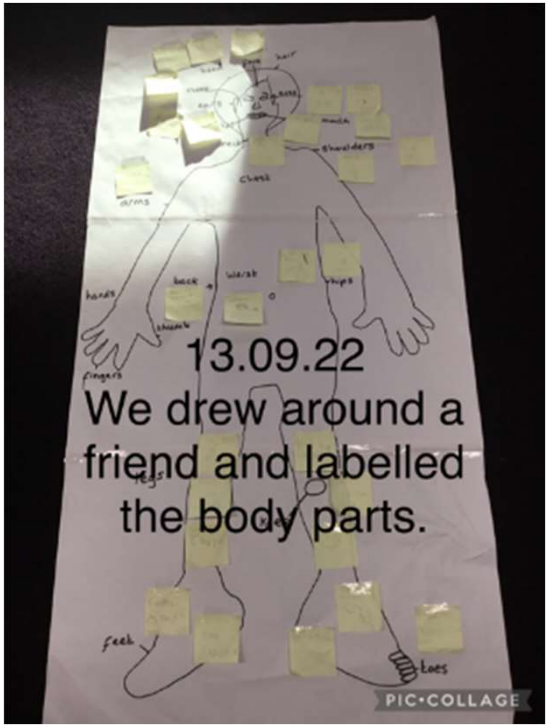
Week: 3 Week Beginning: 9th March Year group: 1

SEND: PP: EAL: Most able:

Subject	Learning Intention	Prior Learning Can you still...?	Whole Class/ Main teaching activity	Follow -up activity	SEND	Stretch and challenge	Plenary Can you now..?
Science Mon	Identify and describe the basic structure of a variety of common flowering plants.	Can you remember what a plant needs to grow? Recap What plants needs to grow. Go through and discuss what a plant needs and ask why?	Powerpoint, staff- (I WILL GET THESE UP FOR YOU). How to grow a flower. (Twinkle) -Children to then plant sunflower seeds (TA). Lesson presentation- planting beans- powerpoint (Twinkle) Discuss questions and equipment. I can plant a seed. I can describe how to plant a seed.	In science books children to stick in order sheet growing a flower- how to plant a seed and also what happens when it grows.	To be supported by 1:1	6 box sheet, children to draw and write six instructions of how to plant a seed and grow it.	Children to say what they did to plant a seed. What have you found out about plants today?
Science Tues	To identify and name a variety of common wild and garden plants, including trees. To identify and	Read Plant Fact cards. Then Plant Challenge cards. Can the children answer questions relevant to the	Children to go on a nature walk around the school grounds and fill in sheet- Scavenger Hunt (With TA)	Title in Science books- Which Plants and Animals live here? Children to draw and label the plants and animals they	To be supported by 1:1	Can you name the flowers and birds you saw?	Children to say what they saw and compare between groups.

WHAT DOES A SCIENCE LESSON LOOK LIKE AT OUR SCHOOL?

1. Can you still? Recall previous learning through quiz, discussion, Online safety question/scenario.
2. Introduce new learning- Including new vocab (My turn, your turn).
3. Paired work, group work, whole class collaboration.
4. Recording new learning in a range of ways.
5. Mini plenaries.
6. 'Sticky learning' – checking pupil's sense of ideas in relation to what they already know.



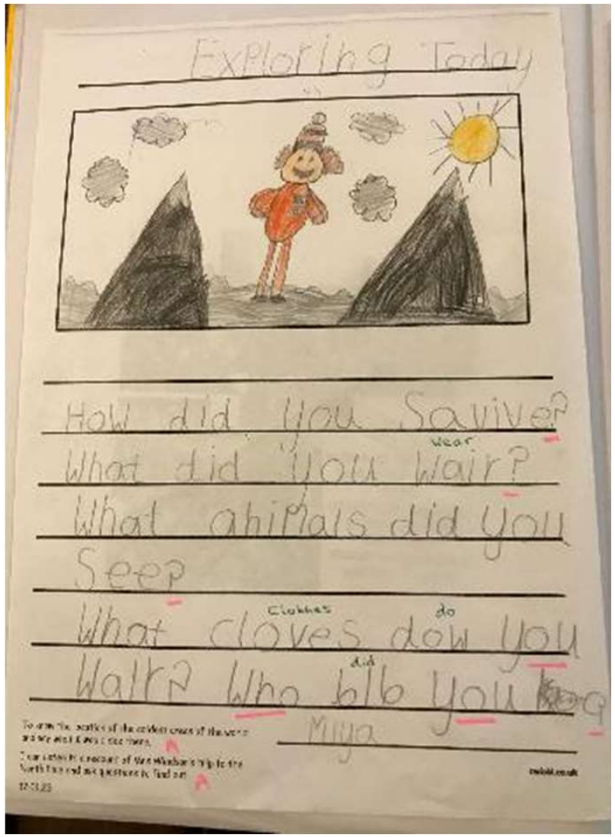
IMPACT

- At Cheadle Catholic Infant School, we recognise the importance of science in every aspect of daily life. As one of the core subjects taught in primary schools, we give the teaching and learning of science the prominence it requires.

- The scientific area of learning is concerned with increasing pupils' knowledge and understanding of our world, and with developing skills associated with science as a process of enquiry. It will develop the natural curiosity of the child, encourage respect for all living things, their habitats and the physical environment providing opportunities for critical evaluation of evidence.

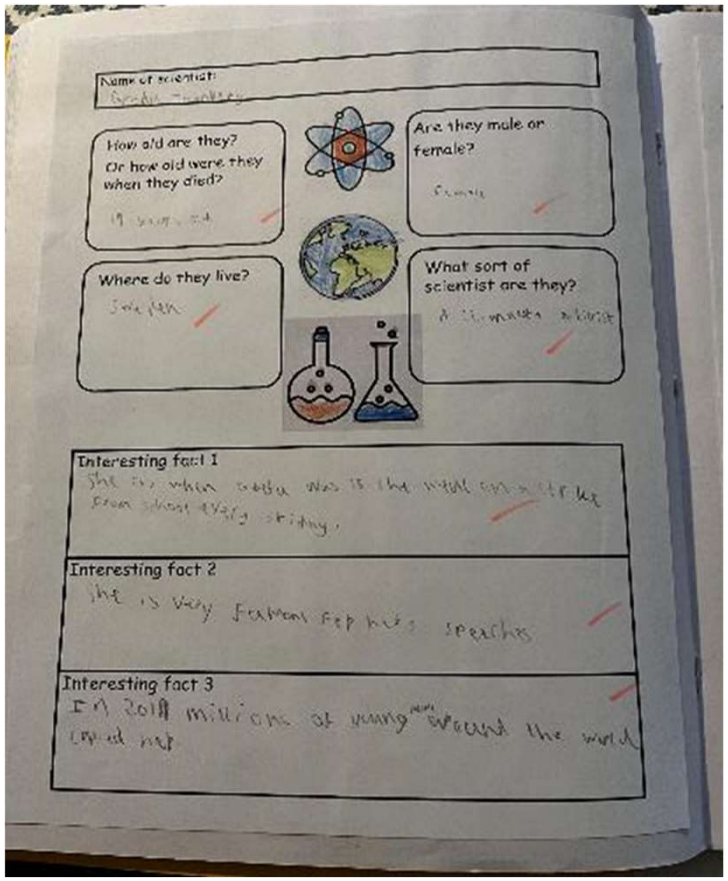
- We endeavour to ensure that the science curriculum we provide will give children the confidence and motivation to continue to further develop their skills into the next stage of their education and life experiences. We consider and make use of 'Science Capital' as a conceptual tool to help develop our pupils' aspirations and involvement in science. Moreover, we aim to prepare our pupils for life in an increasingly scientific and technological world.

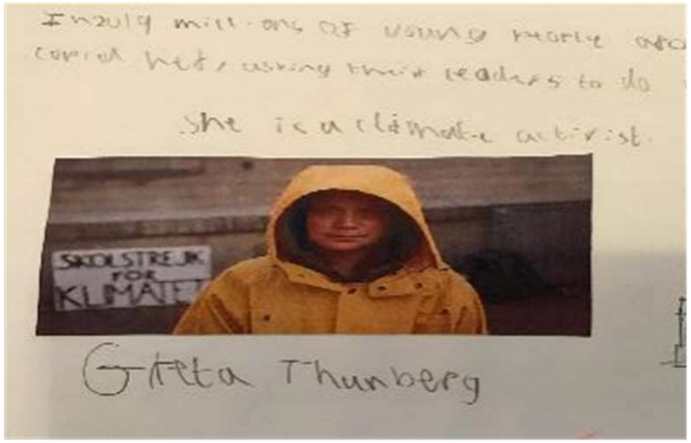
- To achieve this it involves exciting, practical hands on experiences that encourage curiosity and questioning. We will inspire our children by giving them the opportunities to pursue their natural curiosity and promoting the experience of exploring and investigating scientific facts in a range of contexts. This will ensure a continually evolving knowledge and understanding of their world.



ENSURING CULTURAL CAPITAL OF SCIENCE

- We develop curiosity of the world through activities and experiences such as a visit from a Polar explorer, the Wonder Dome, visitors with animals and using the local environment at Bruntwood park for hands on learning.
- Children actively take part in activities that are well planned out, choosing from different sources that are suitable for the year group.
- Thinking scientifically and expanding vocabulary – so that children aren't just given science knowledge and facts. This develops lifelong skills and types of enquiry in everything we do.
- We encourage science to be seen equally within genders and ethnicity – for example, female scientists, black scientists. Diversity is presented within the resources that we use.





INCLUSION – PROVIDING AN INCLUSIVE CLASSROOM FOR ALL

We endeavour to cater for individual needs, providing in-depth learning for all children:

- By treating each of our pupils as equals.
- By valuing diversity and celebrating differences whether it be differences in a child's culture, language, socioeconomic status, gender, religion, disabilities or needs.
- By promoting a "Can do" attitude to learning.
- By promoting a sense of community which requires the development of positive relationships between all people, teachers, pupils and their families.
- By accepting all learners abilities, interests, skills and talents.
- By creating a pupil-centred approach where a child can be actively involved in the learning process.
- By collaborating with appropriate professional personnel to share knowledge, skills, best practice, specialist equipment, or resources wherever possible to enhance a child's learning environment.

HOW CAN WE MAKE SCIENCE ACCESSIBLE TO CHILDREN WITH SEND AT OUR SCHOOL?

We know that children with SEND can find the retention of facts difficult.

We have created a reflective document to explain the strategies in place to support all children including those who have been identified as having Special Educational Needs/Disabilities.

In doing this, we will ensure that all children are engaged in their learning and given the best possible chance to achieve their potential.

Our four key strategies for teaching are:

Strategy 1- Repeated learning

- Schemes of work overlap so children are revisiting work from previous years.
- Quizzing- to remember previously taught learning/vocab/skills.

Strategy 2- Collaborative learning

- Group work
- Paired work- mixed ability
- Whole class collaboration

Strategy 3- Recording in different ways

- I-pad work
- Photographs
- Photographs with scribed pupil voice

Strategy 4- Duration of activities

- Lessons are broken down into short, concise activities
- Information is presented in small chunks

CHALLENGE AND ADAPTIVE TEACHING

CHALLENGE: We challenge our children to think and question deeply. Children complete 'stretch and challenges' once they have finished their main activity.

- In the scheme of work time has been taken to identify key opportunities for challenge.
- Opportunities for deeper understanding are identified through an understanding of where learning is going in the future and application and reflection of key knowledge.
- Wider curriculum opportunities applied: writing in up scientific links to Literacy, computing units.

EAL:

- Independent challenges are accessible and practical.
- Children can evidence their work through pictures/videos/ voice recordings that they have recorded independently.
- Regular recapping of vocab using the Science working wall to revise and revisit.
- Use of sentence stems and scaffolds for written work.
- One to one or group support during introductions.
- When the children are completing their work and independent challenges they have adult support or are put with an appropriate partner.

LINKING LEARNING AND REMEMBERING LEARNING

- **Vocabulary and concepts recapped regularly:** Use of working walls to refer to vocabulary and key concepts on a regular basis.
- **Assessment strategies:** , end of unit assessments, quizzes used to recap each unit.
- **Sticky learning:** School visits, hands on investigations, DEAL strategies, active learning techniques.
- **Revisiting and remembering more overtime:**
  - *Class discussions* 'last year, you learnt… and this year you'll… before next year when you study…'.
- **Early Years –** previously taught practical activities are then used as independent challenges in future lessons.
- **KS 1- Quizzes:** High challenge and low threat.

ASSESSMENT - MEASURING PROGRESS, KNOWLEDGE, SKILLS AND CHALLENGE

In KS1 assessment sheets are completed by the class teacher at the end of each unit. This highlights children that are working towards the expected standard and working at the expected standard in science.

In the Early Years year groups, assessment sheets are completed by the class teacher. In the Early Years a child's progress can be assessed by the outcome of the work they have produced in their learning journey/display work.

Teachers also complete an assessment sheet at the end of the year to highlight children that are on track or have not met the science national curriculum objectives.

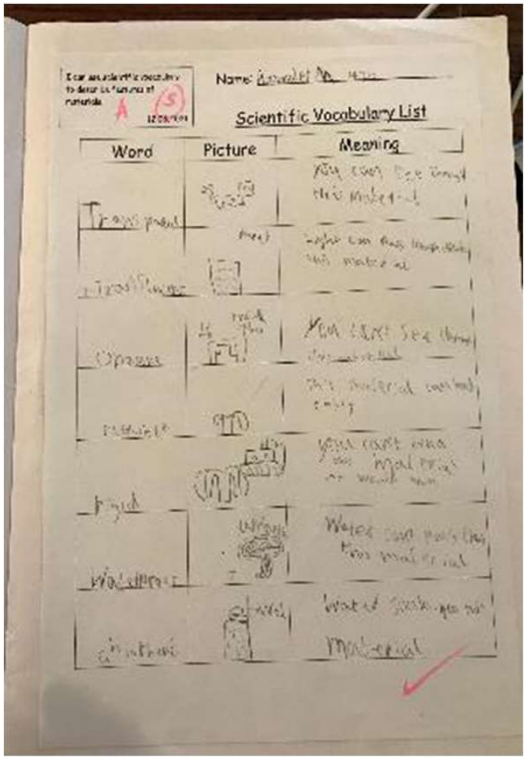
This data enables changes to be applied where patterns emerge in specific working scientifically areas or with specific learning objectives.

Tools used weekly as formative assessment include:

- Teacher Questioning – Open and closed questions.
- Assessment by outcomes- the evidence will be recorded in the child's science book.

In line with our school assessment policy all teachers in science must:

- Assess against the key skills for that particular year group. Class teacher to highlight areas on key skill progression sheet within assessment file.
- End of year assessments for each child showing whether the child has achieved expected, below or above aged related expectations within the subject area.

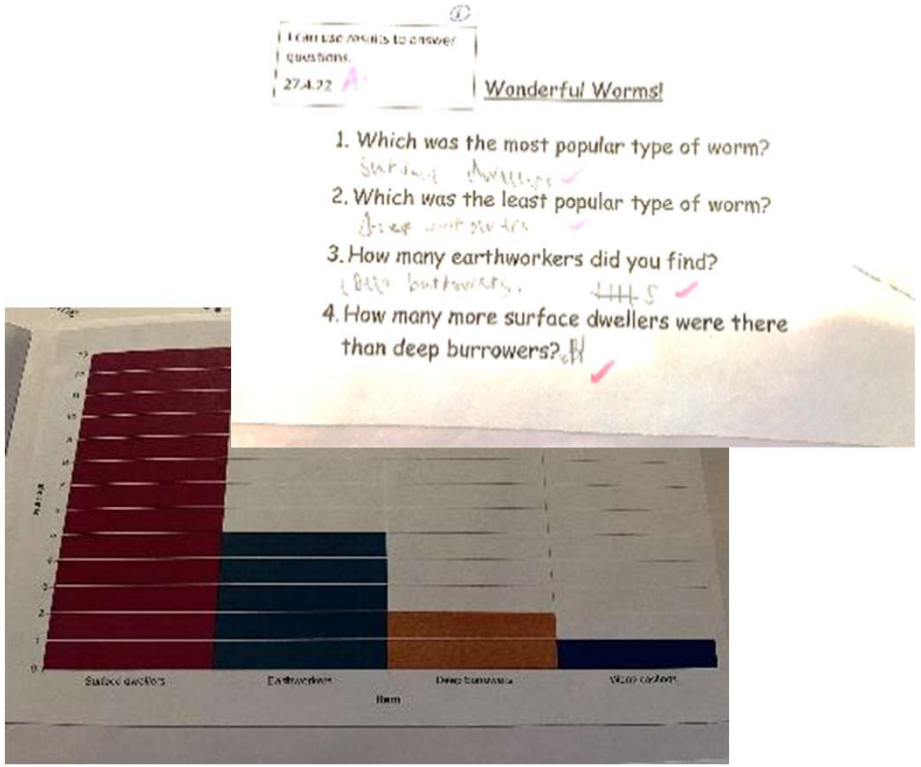


SUBJECT EVALUATION

Regular subject monitoring is used to ensure open dialogue between subject leaders and class teachers.

How do I find out about what's going well and what needs to improve:

- Subject leader days
- Book looks
- Learning walks
- Classroom observations
- Teacher voice
- Discussions with the school headmistress and school advisor
- Pupil voice



PUPIL VOICE

Pupil voice activities with Year 1 and 2 children showed that the children were understanding and retaining the information they were being taught.

During pupil voice discussions, children were asked to talk me through their learning journey or science book at the work they have produced during their time in school.

Children's attitudes were very positive. They were enjoying learning about science and the way that it was being taught.

Year 1

- "It is interesting because I am learning new things"
- "I love it because it is fun"
- "Science is very good because we do experiments"
- "I wish we could do more science"

Year 2

- "I enjoy science because you can watch how things change"
- "I enjoy it because I am learning new things"
- "It is interesting because I learn about the world around me"
- "My mum is a scientist and I want to be one when I'm older too"

Pupil Voice – Year 1

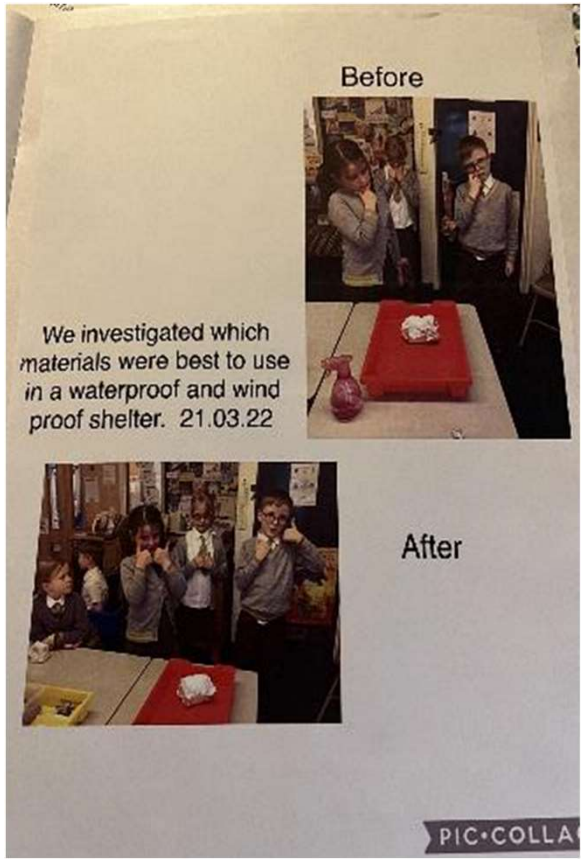
Year Groups	Key knowledge concept questions	Subject discipline skills questions	Questions about End Points (include previous year group/phase)	Questions around vocabulary (which words would you like them to remember and talk about)
Body	How do taste work? (i.e. taste buds sending signals to the brain) Oliver- there are dots on your tongue that make you taste things. Eva- taste buds are what make you taste.	How did we find out which foods were children's favourites? (taste test?) Jasper – We did a fruit tasting test and did a tally of which was our favourite fruit.	What are the five senses and which parts of the body do they relate to? Issy- Taste- tongue Smell- nose Sight-eyes Feel- hands Hearing-ears	How do we use Sight, sound, touch, taste, smell? Various- Sight- by looking around Sound- hearing music Touch- feel things like a cat Taste- Eating or drinking Smell- you use your nose to smell things like your dinner
Materials	Choose which material you would choose for a ring, a jumper, a ball, a door, a window?	What are the different types of materials? How can we find out if one material is better than another for something? What experiment did we do about absorbent materials? Do you know what type of experiment it was?	Describe the simple physical properties of a variety of everyday materials. (wood, sponge etc)	What do these words mean? waterproof, absorbent, rough, smooth, shiny, dull, see-through, not see-through, Opaque

PUPIL VOICE – YEAR 2

Year 2				
Plants	What happens when something germinates? (Germinate: This is when a seed begins to grow, using its stored food, and put out roots and shoots.) It means it has started to grow. It's when the seed starts to grow. The seed changes.	Do seeds grow quicker inside or outside? Outside It depends what flower they are. It needs air, time, soil, sunlight and water. What is the most common plant on the school grounds, and how did we find out? Grass- because it is everywhere. We walked across the school fields and looked in the Forest garden. Daisies grow a lot in the summer- I've seen those all over the school field. Trees are common.	Can you observe and describe how seeds and bulbs grow into mature plant what happens? They need Water Sunlight and Air Food They gominate and get bigger. We see storks, leaves, petals. The seed shell cracks, the root comes down and the shoot comes up. The leaves start to grow and then a flower. It then dies. The seeds drop out and the growing process starts again.	What do you know about Trees? Evergreen trees grow all year. Holly, Conifer, Christmas tree, Fir trees are Evergreens. Deciduous trees are oak, horse chestnut, sycamore. They lose their leaves.

Body	Why is exercise important to animals? (keeps animal's bodies in good condition and increases survival chances.) So we stay healthy and fit. So we don't die early. How do we keep healthy? Have lots of sleep. Eat lots of fruit and vegetables. Do exercise. Do not have devices on at night-time. Wash your hands.	What different parts of the body are improved by different exercises? Shoulders Heart Muscles Legs arms	Describe the basic needs of animals, including humans, for survival (water, food and air) Air Water food	What do we mean by Offspring, reproduction, growth? When you have a baby Babies turn to toddlers You grow when you are healthy You get bigger when you grow

Materials	Why is a water bottle made of plastic? because it is transparent allowing you to see the drink inside and waterproof so that it holds the water, flexible so it won't break easily. If it was glass it would hurt you if it broke It is strong and waterproof Metal- it is not light, you can-not see through it.	Why are clothes and furniture made from materials they are? What's the pattern? Clothes- You can't wear glass. Metal and plastic is not soft. Wood is not comfortable and very hard to put on. Clothes are fabric and wool. They need to be flexible. Furniture- Wood- it needs to be strong, like for a bookcase.	Tell me about the suitability wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses? wood-bookcase metal- pipe plastic- water bottle brick- houses rock- pavements paper- school books cardboard- boxes	What do we mean by: Rigid materials are stiff and hard to bend. Elastic materials are able to stretch then go back to their original shape. Flexible materials can bend easily. Transparent means you can see through it. Rigid- you can't bend it and it is not flexible.



SCIENCE – CHILDREN'S BOOKS AND OUTCOMES

Non-negotiables for the presentation of science and children's expectations.

- **Cover sheets** for each science unit containing prior key vocabulary.
- **Date and learning objective** evident in children's work.
- **Presentation and outcomes consistent across year groups:** Classes are presenting learning in the same format and with the same high expectations to challenge children and ensure high quality presentation.

Broad, rich and balanced science curriculum evident through children's learning.

Sequential learning throughout lessons and progression is evidenced in books.

Vocabulary emphasis: children are using vocabulary within their written work and spoken in classroom discussions.

Planning for investigations is developing across the year groups.

STRENGTHS

- Unique, bespoke scheme of work.
- Children have a love of science.
- Clear progression from Nursery – Year 2.
- 'Can you still?' to start every KS1 lesson.
- SEND strategies for learning.
- Stretch and challenges.
- Key concepts clearly mapped out.
- Key vocabulary clearly mapped out.
- Children get lots of enrichment activities to bring the curriculum to life.
- The children are well prepared for Science in KS2.

Bespoke scheme of work: Clear coverage across each unit. Carefully planned to ensure the development of skills. The scheme of work is followed carefully.

Progression for assessment: Vocabulary and objectives are clear for staff to form judgements. Assessment procedures are in place to aid this process.

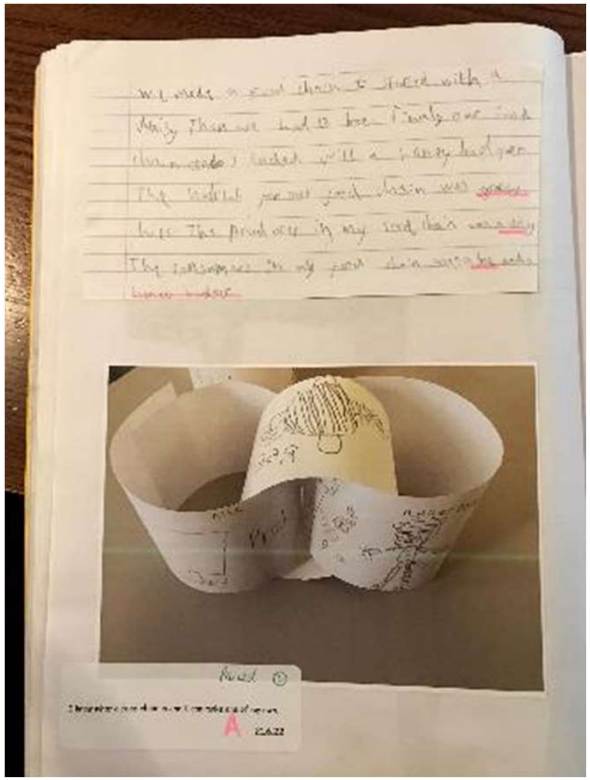
Engaging lessons: These are driven by a quality scheme of work and high-quality teaching and learning. Subject leader is easily accessible for guidance and planning mis-conceptions.

Our curriculum reflects the world we live in and includes a diverse range of events and people. Explanation of key vocabulary ensures the world around them makes sense.

Children build on previous learning through the careful planning so that they are not learning about people or events in isolation.

Children are given the opportunity to revisit key knowledge repeatedly to ensure long term retention of facts.

NEXT STEPS



Develop children's understanding of what Science is. Promote children's curiosity with engaging activities and inclusive planning.

Develop children's understanding of the key concepts. Continue to develop working scientifically skills and scientific enquiry.

Support staff development and feedback latest guidance from courses and meetings.

Introduce TAPS assessment for working scientifically and the understanding of enquiry skills.

To refine assessment techniques to make data more accurate and more useful to improve outcomes across school.

Evidencing- ensuring all class evidence books are up to date and show examples of children's learning and pupil voice.

To add even more opportunities for cultural capital, events within close proximity to school.

To prioritise the learning of vocabulary, utilising whole school methods such as 'my turn, your turn', word of the week.