

SCAMBLESBY CHURCH OF ENGLAND PRIMARY SCHOOL

SCIENCE POLICY



“What I love about science is that as you learn, you don’t really get answers. You just get better questions.” – John Green

Our Vision:

At Scamblesby CE Primary School, our vision is to provide children with a Science curriculum that enables them to explore and discover the world around them. To accomplish this, we aim to provide lessons rooted in scientific enquiry with practical hands-on experiences that encourage a deeper understanding and curiosity with questioning.

We believe it is vital to promote and develop transferrable skills such as observation, communication and team work to evolve the whole child as a lifelong learner. Our objective is to provide lessons which consolidate prior knowledge, encourage deeper understanding and that are rooted in scientific vocabulary.

Science makes an increasing contribution to all aspects of life. Children are naturally fascinated by everything in the world around them and Science makes a valuable contribution to their understanding. Children learn by playing with things in their world. They pick up clues about what they see, touch, smell, taste and hear in order to make sense of it all. Eventually they come to conclusions which they match up with all the experiences they have had.

We encourage and help children to take a second, careful look at the world. By talking together children can be encouraged to explore and observe so that they can group objects and events and look for similarities and differences. They will need to measure and record the things they have found out in ways that make sense to them so that later they can talk to other people, (parents/carers/friends) about what they have discovered. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. Wherever possible science work will be related to the real world and everyday examples will be used.

Our Aims: *(linked to the national curriculum 2014)*

- to develop pupils’ enjoyment and interest in science and an appreciation of its contribution to all aspects of everyday life;
- to build on pupils’ curiosity and sense of awe of the natural world;
- to use a planned range of investigations and practical activities to give pupils a greater understanding of the concepts and knowledge of science;

- to introduce pupils to the language and vocabulary of science;
- to develop pupils' basic practical skills and their ability to make accurate and appropriate measurements;
- to extend the learning environment for our pupils via our environmental areas/outdoor learning and the locality;
- to promote a 'healthy lifestyle' in our pupils;
- to develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics;
- to 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;
- to equip the children with the scientific knowledge required to understand the uses and implications of science, today and for the future;
- To promote excitement and curiosity about science and their learning.

Whole School Long-Term Overview:

	Y1/2	Y3/4	Y5/6
AUTUMN	<i>Earth and Space and Seasonal Changes Light and Sound Electricity</i>	<i>Light Sound Electricity</i>	<i>Light Earth and Space</i>
SPRING	<i>Forces Materials Habitats and Living Things</i>	<i>States of Matter Materials Forces and Magnets</i>	<i>States of Matter Materials Rocks and Soils Forces and Magnets</i>
SUMMER	<i>Plants Animals and Humans Habitats and Living Things</i>	<i>Plants Animals and Humans Evolution Living Things and their Habitats</i>	<i>Plants Animals and Humans Evolution</i>

Organisation of the curriculum:

Our Science Curriculum Overview is based on Chris Quigley's Curriculum for Small Schools and it ensures that pre-requisite knowledge is considered and linked to new learning;

Units are sequenced so that knowledge and understanding builds on previous units and are revisited and developed each year, ensuring suitable provision of 'basic, advancing and deep' teaching and learning opportunities;

Prior learning is referenced at the start of new units so that foundations of learning are used, and Points of Progress Tasks (POP Tasks) are used to introduce each teaching session to revisit previous learning to develop spaced learning and memorisation of key concepts and knowledge.

Key concepts are interleaved throughout the curriculum so that they are regularly revisited.

Whole Song Medium-Term Overview:

Early years:

Science in the Foundation Stage is covered in the 'Understanding the World' area of the EYFS Curriculum. It is introduced indirectly through activities that encourage your child to explore, problem solve, observe, predict, think, make decisions and talk about the world around them.

Children explore creatures, people, plants and objects in their natural environments. They observe and manipulate objects and materials to identify differences and similarities. Children also learn to use their senses, for example feeling dough or listening to sounds in the environment. Children will be encouraged to ask questions about why things happen and how things work. Children will also be asked questions about what they think will happen to help them communicate, plan, investigate, record and evaluate findings.

The children will then build on this knowledge in the units of work that follow in KS1 and KS2.

Key Stage 1:

The principal focus of science teaching in Key Stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They are encouraged to be curious and ask questions about what they notice. They are helped to develop their understanding of scientific ideas by 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. They begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways.

Most of the learning about science is done through the use of first-hand practical experiences, but there are also some use of appropriate secondary sources, such as books, photographs and videos.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1. To aid the use of scientific vocabulary, knowledge organisers and vocabulary booklets will be used alongside each topic.

Key Stage 2:

In Lower Key Stage 2 children broaden their scientific view of the world around them.

They do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar

environments, and by beginning to develop their ideas about functions, relationships and interactions.

They ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.

They draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Children should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

In Upper Key Stage 2, children develop a deeper understanding of a wide range of scientific ideas.

They do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.

They encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates.

They also begin to recognise that scientific ideas change and develop over time.

They select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information.

Pupils draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. Children should read, spell and pronounce scientific vocabulary correctly.

In the first session of each unit of work, knowledge organisers are introduced, which summarise key concepts, knowledge and vocabulary, and they are then referred to during the course of the unit of work as part of spaced learning.

An example is provided below:

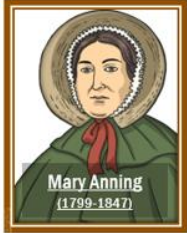


Rocks and Soil

Scamblesby CE Primary School:

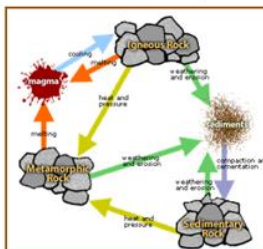


Mary's family lived at the beach and would spend lots of time trying to find shells and fossils that they could sell. Later, when Mary was 12 years old, she discovered a gigantic fossil hiding in the rocks. Unfortunately, her discovery was stolen by a male palaeontologist and she wasn't well-known until well after her death.



Mary Anning
(1799-1847)

Types of Rocks and the Rock cycle



Igneous



Basalt Granite

Igneous rock is formed by molten lava cooling.

Metamorphic



Marble Slate

Metamorphic rock is formed through heat and pressure.

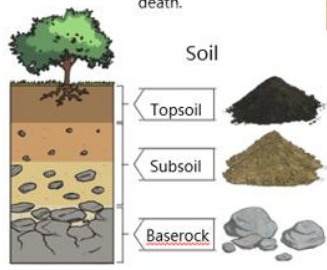
Sedimentary



Sandstone Chalk

Sedimentary rock is formed by compressing sediments.

Soil



Topsoil
Subsoil
Baserock

The Fossilisation Process

An animal dies. It gets covered with sediments which eventually become rock.



More layers of rock cover it. Only bones, shells and teeth remain.



Over thousands of years, sediment might become a cast fossil. Bones become minerals.



Changes in sea level take place over a long period.



After erosion takes place, eventually the fossil is exposed.



Lessons are structured around Powerpoints which provide opportunities for revisiting prior knowledge, accessing POP tasks and structure each session's teaching and learning.

An example is provided below:

SCANLEIGH C.E. PRIMARY SCHOOL

SCIENCE – Exploring Forces

Date: w.c. 13th March 2023

LO: To know the factors that can increase and decrease friction, air resistance and water resistance



SCANLEIGH C.E. PRIMARY SCHOOL

POP!

Tell us about Isaac Newton.
What is gravity?
What is friction?
What do forces actually 'do'?
Imagine a world without forces...



1. What did we learn in our last session? [Recap of knowledge].

Year 5 Forces
Science Knowledge Organiser

Knowledge Skills Vocabulary

Forces and motion

Can I explain that...
Can I identify the...
Can I recognise that...

What is Friction?

Push Pull

3. Important Vocabulary.

Forces and motion

Force Motion Gravity
Push Pull Weight
Friction Newtons
Drag Equal
Resistance Unequal
Streamlined Float
Sink
Submerge
Displacement
Upthrust

2. What are we learning today? [Our new knowledge].

TYPES OF FORCE

FRICION FORCE GRAVITY FORCE APPLIED FORCE SPRING FORCE
DRAG FORCE NORMAL FORCE MAGNETIC FORCE ELECTRIC FORCE

AIR RESISTANCE
WATER RESISTANCE
FRICITION

4. Today's learning / activity.

We will be working in one of three groups.

- Group 1 will be studying the effects of friction;
- Group 2 will be studying the effects of air resistance;
- Group 3 will be studying streamlining and water resistance.

You will be devising your own investigations to explore aspects of these scientific processes.

All stages of the process will be recorded on tapestry and the planning process will be formulated in your groups.

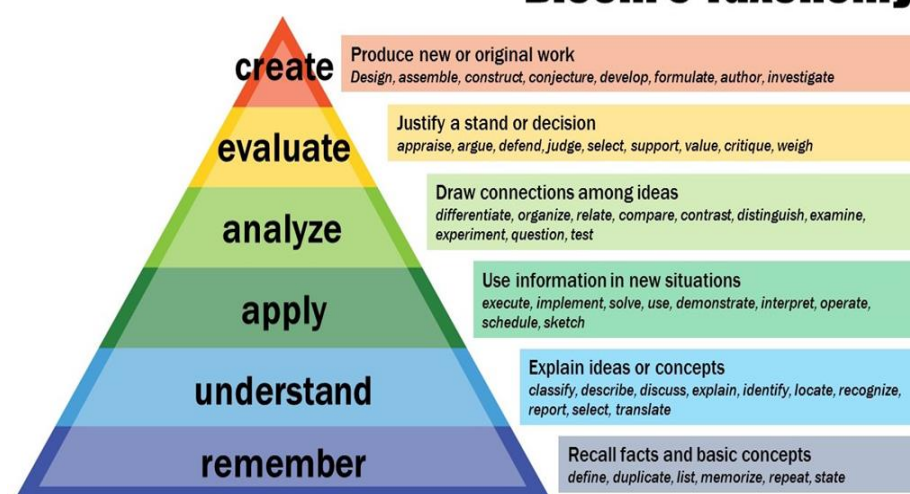
When Resistance is in action!

Progression:

Our curriculum is progressive: topics are revisited every year, giving opportunities for children to achieve on a Basic, Advancing and Deep level of understanding. In Y1, Y3 and Y5, as the children start their journey through each Milestone, the expectation is for the children to achieve Basic and Advancing levels of understanding and

knowledge, while in Y2, Y4 and Y6, there are opportunities for the children to achieve a Deep level of understanding and knowledge.

Our science curriculum uses Bloom's Taxonomy's progression of skills and understanding to extend knowledge and application:



Focus On...

To illustrate this, the 'Plants' Unit of Work demonstrates how the Success Criteria for each Milestone is based on Basic, Advancing and Deep responses:

MILESTONE 1: Y1/2: Plants (Summer Term)				
Understand plants: This concept involves becoming familiar with different types of plants, their structure and reproduction.				
- Identify and name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen. - Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers. - 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.				
Vocabulary Flower, stem, roots, stalk, seeds, bulbs, pollen, trunk, leaves, deciduous, evergreen, sycamore, oak, pine, holly, trees, bushes, moss, vegetables, fruit, life cycle, oxygen, sunlight,				
1	To know a range of plants and trees and their characteristics, including if they are deciduous or evergreen	Why might someone want to plant fir trees? Which different trees can be found around the school? SC: I know the name of trees which are evergreen and which are deciduous. (B) SC: I know the similarities and differences between deciduous and evergreen trees and can think of some ways to categorise plants. (A) SC: I can suggest a garden design for someone who likes privacy and bright autumn colours. (D)	Share Knowledge Organiser 'Gardener's World' activity. Design gardens for different needs – all year privacy, bright colours, children...	
2	To know the basic structure of a flowering plant and the purpose of each part.	What two purposes do roots have? Why are petals brightly coloured? SC: I know the names of parts of flowering plants and I can describe the structure of each part of a flowering plant. (B) SC: Taking a selection of (real) different flowering plants, I know what are the structural features (A) SC: I can explain why roots are always at the bottom of a plant and why they are the first thing to grow. (D)	Art – Collage opportunity	
3	To know why plants need sunlight, water and a suitable temperature to grow effectively	What happens if a plant does not get watered enough? Is sunlight important for a plant to grow healthily? SC: I know what plants need to stay healthy. (B) SC: I know how to recognise plants that have been exposed to insufficient temperature, light, water or space. (A) SC: I can devise a way of proving that plants need certain conditions for growth.	Link back to 7 life processes. Investigation about different requirements for plants to grow	

Milestone 2: Y3/4: Plants (Summer Term)

Understand plants

This concept involves becoming familiar with different types of plants, their structure and reproduction.

- Identify and describe the functions of different parts of flowering plants: roots, stem, 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 role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Vocabulary Root, stem, leaves, nutrients, soil, transported, life cycle, pollination, seed dispersal, anther, stigma, style, ovary, stamen, sepal, ovule

Session	Learning Objective	Learning Question / Success Criteria	Lesson Outline
1	to know and describe the functions of different parts of flowering plants	What are the different parts of plants and what are their functions? SC: I can name and explain the function of roots, stems, leaves and flowers. (B) SC: I can identify ideal conditions for plant growth. (A) SC: I can explain the importance of leaves for plants' growth and survival. (D)	Share Knowledge Organiser Start experiment to explore best conditions for growth, set up and record as a class over the coming weeks. Children to write plan and fair test, set up observation sheets. Complete this as a class. Watch the following and discuss: https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-what-do-plants-need-to-survive/zkw2qwx https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-parts-of-a-plant/zvdkpg https://www.youtube.com/watch?v=UPBMG5EYydo Basic: label plant and write functions. Children to draw their own or use a diagram. Advancing: Explain how leaves are important in creating food for a plant. Prove or disprove that roots act like straws.
2	to know how water is transported in plants	How is water transported in plants? SC: I know that roots and stems transport water and nutrients to the rest of the plant. (B) SC: I can demonstrate that water is transported through stems using food colouring. (A) SC: I can conduct an investigation to compare water transportation in different plants. (D)	Watch: https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-how-does-water-get-from-the-roots-to-the-leaves/zdtfjhw Set up experiment using white flowers, celery and food colouring. Children to write up experiments in books – what do they predict will happen? with a labelled diagram. Advancing: Can you change the colour of celery? Prove it. Children to carry out experiment independently.
3	to know the life cycle of flowering plants	What is the life cycle of a flowering plant? SC: I can sequence the life cycle of a flowering plant. (B) SC: I can name the processes involved in the life cycle of a flowering plant. (A) SC: I can name, label and annotate a diagram of the flower of a plant and explain how new plants can be made. (D)	Lesson 1: parts of a flower – dissect to look and then children to draw and label or make/use flower parts and photograph. Watch: https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-the-anatomy-of-the-flower/zjmhkmn Advancing: Compare the parts of two different flowers Lesson 2: Life cycle of flower – practical session on pollination – act out the process – Watch: https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-what-is-pollination-and-how-does-it-work/zv4df4j Basic: children to draw and label the process. Advancing: Suggest reasons why people are worried about the falling number of bees in the UK. Explain why a flower that is not pollinated will not reproduce.

MILESTONE 3: Y5/6 Plants (Summer Term)

Understand plants

This concept involves becoming familiar with different types of plants, their structure and reproduction.

Relate knowledge of plants to studies of evolution and inheritance.

Relate knowledge of plants to studies of all living things

Describe the life process of reproduction in some plants and animals.

Describe how living things are classified into broad groups according to common observable characteristics.

Give reasons for classifying plants and animals based on specific characteristics.

Vocabulary Root, stem, sepal, ovule, ovary, style, stigma, flower, anther, filament, stamen, 7 life processes (movement, nutrition, sensitivity to heat / light, respiration, reproduction, excretion, growth),

Learning Objective	Learning Question / Success Criteria	Lesson Outline
To know the function of parts of flowering plants, requirements of growth, water transportation in plants,	How do plants demonstrate the 7 life processes (movement, nutrition, sensitivity to heat / light, respiration, reproduction, excretion, growth) SC: I know the 7 life processes. (B)	Share knowledge organiser; 'Email an Alien' explanation Demonstration and research, and interactive posters / leaflets / extended

life cycles and seed dispersal.	SC: I can make comparisons between the 7 life processes and how they relate to different plants, animals and humans. (A) SC: I can explain and elaborate the 7 life processes to a specific audience. (D)	writing about the parts and function of plants, inc. seed dispersal
To know the processes of plant reproduction	How are new plants created? SC: I can draw and describe plant reproduction. (B) SC: I can demonstrate and explain sexual and asexual reproduction in plants. (A) SC: I can relate the reproduction of plants to the reproduction of insects. (D)	Discussion and research about seed dispersal, and the process of pollination and germination; Children produce comic strip / presentation (YouTube tutorial-style) about how plants reproduce and 3D flowers with annotations
To know how to classify plants based on specific characteristics.	How can well-chosen criteria help us name plants? SC: I can use a branching diagram to identify and name a plant. (B) SC: I know how to use a branching diagram in reverse to describe a plant's characteristics. (A) SC: I can create a branching diagram to classify a range of plants. (D)	Branching database diagrams to classify and sort plants
To know that plants need sunlight, water and suitable conditions to grow effectively	Does it matter where I place my indoor plants? SC: I know how the 7 life processes relate to successful plant growth. (B) SC: I can suggest which variables to change to identify conditions needed for successful plant growth. (A) SC: I can change variables to affect plant growth, and use measurements to compare results and produce detailed conclusions. (D)	Investigation which compares location and watering of plants – compare and contrast and assess variables in action.

Equal Opportunities and SEN. Racism and Inclusion:

All children have equal access to the science curriculum and its associated practical activities. At Scamblesby CE Primary School, we ensure that all children, irrespective of gender, learning ability, physical disability, ethnicity and social circumstances, have access to the whole curriculum and make the greatest possible progress. Where appropriate, work will be adapted to meet pupils' needs and, if appropriate, extra support given. More able pupils will be given suitably challenging activities. Gender and cultural differences will be reflected positively in the teaching materials used. Differentiation will be by resources provided, level of support given or by outcome.

Marking:

Much of the work done in science lessons is of a practical or oral nature and, as such, recording will take many varied forms thus making formal marking different. It is, however, important that written work is marked regularly and clearly, as an aid to progression and to celebrate achievement. When appropriate, pupils may be asked to self-assess or peer assess their own or other's work. The Scamblesby CE Primary School's Marking Policy must be followed when marking written work. Tapestry is used to record photographs and videos and shared and celebrated with classes and families, as well as a means to assess pupils' progress and to provide examples for lesson studies by staff.

Displays:

Classroom displays play a vital part in effective science provision across the school. Displays contain knowledge organisers and key information and vocabulary and mirror the medium term plans by chronicling each session's learning objectives and activities. Displays are referred to during teaching sessions and celebrate examples of high quality work by the pupils.

Assessment:

At the end of each unit of work, children are presented with a selection of POP tasks (Points of Progress Tasks), taken from the Chris Quigley Small Schools Curriculum.

At the end of each unit of work, children are assessed against the appropriate Milestones for that subject, using Teacher Assessment and responses Rising Stars Diagnostic Tests, as well as through reference to Y2 and Y6 National Curriculum expectations. These provide teachers and the subject leader with accurate assessments to assess attainment and progress.

An example of Milestone 1: (Y1/2) Light, Sound, Forces and Electricity

[illegible]

An example of Milestone 2: (Y3/4) Light, Sound, Forces and Electricity

[illegible]

An example of Milestone 3: (Y5/6) Light

LIGHT: MILESTONE 3	Names																			
Understand 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 eyes.																				
Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes.																				
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.																				

END OF KS1:

NAME:

Working at the expected standard

Working scientifically

The pupil can, using appropriate scientific language from the national curriculum:

- ask their own questions about what they notice
- use different types of scientific enquiry to gather and record data, using simple equipment where appropriate, to answer questions:
 - observing changes over time
 - noticing patterns
 - grouping and classifying things
 - carrying out simple comparative tests
 - finding things out using secondary sources of information
- communicate their ideas, what they do and what they find out in a variety of ways.

Working at the expected standard

Science content

The pupil can:

- name and locate parts of the human body, including those related to the senses [year 1], and describe the importance of exercise, a balanced diet and hygiene for humans [year 2]
- describe the basic needs of animals for survival and the main changes as young animals, including humans, grow into adults [year 2]
- describe the basic needs of plants for survival and the impact of changing these and the main changes as seeds and bulbs grow into mature plants [year 2]
- identify whether things are alive, dead or have never lived [year 2]
- describe and compare the observable features of animals from a range of groups [year 1]
- group animals according to what they eat [year 1], describe how animals get their food from other animals and/or from plants, and use simple food chains to describe these relationships [year 2]
- describe seasonal changes [year 1]
- name different plants and animals and describe how they are suited to different habitats [year 2]
- distinguish objects from materials, describe their properties, identify and group everyday materials [year 1] and compare their suitability for different uses [year 2].

Year 3:

NAME:

End of Year Expectations



Science

Year 3

Scientific Enquiry

Ask relevant questions, using 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, taking 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, drawings, labelled 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.

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.

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

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.

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.

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 describe magnets as having two poles.

Predict whether two magnets will attract or repel each other, depending on which poles are facing.

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

Light

Recognise that they need light in order to see things and that dark is the absence of light.

Notice that light is reflected from surfaces.

Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.

Recognise that shadows are formed when the light from a light source is blocked by a solid object.

Find patterns in the way that the size of shadows change.

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.

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.

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 ($^{\circ}\text{C}$)
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

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.

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 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
- Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- Recognise some common conductors and insulators, and associate metals with being good conductors.

End of KS2:

Working at the expected standard

Working scientifically

The pupil can, using appropriate scientific language from the national curriculum:

- describe and evaluate their own and others' scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources
- ask their own questions about the scientific phenomena that they are studying, and select the most appropriate ways to answer these questions, recognising and controlling variables where necessary (i.e. observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, and finding things out using a wide range of secondary sources)
- use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate
- record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- draw conclusions, explain and evaluate their methods and findings, communicating these in a variety of ways
- raise further questions that could be investigated, based on their data and observations.

Science content The pupil can:

- name and describe the functions of the main parts of the digestive [year 4], musculoskeletal [year 3] and circulatory systems [year 6]; and describe and compare different reproductive processes and life cycles in animals [year 5]
- describe the effects of diet, exercise, drugs and lifestyle on how the body functions [year 6]
- name, locate and describe the functions of the main parts of plants, including those involved in reproduction [year 5] and transporting water and nutrients [year 3]

Continued on the next page

- use the observable features of plants, animals and micro-organisms to group, classify and identify them into broad groups, using keys or other methods [year 6]
- construct and interpret food chains [year 4]
- describe the requirements of plants for life and growth [year 3]; and explain how environmental changes may have an impact on living things [year 4]
- use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved [year 6]; and describe how fossils are formed [year 3] and provide evidence for evolution [year 6]
- group and identify materials [year 5], including rocks [year 3], in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties [year 5]
- describe the characteristics of different states of matter and group materials on this basis; and describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle [year 4]
- identify and describe what happens when dissolving occurs in everyday situations; and describe how to separate mixtures and solutions into their components [year 5]
- identify, with reasons, whether changes in materials are reversible or not [year 5]
- use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects [year 6], and the formation [year 3], shape [year 6] and size of shadows [year 3]
- use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard [year 4]
- describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source [year 4]
- describe the effects of simple forces that involve contact (air and water resistance, friction) [year 5], that act at a distance (magnetic forces, including those between like and unlike magnetic poles) [year 3], and gravity [year 5]
- identify simple mechanisms, including levers, gears and pulleys, that increase the effect of a force [year 5]
- use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it; and use recognised symbols to represent simple series circuit diagrams [year 6]
- describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system; and explain the apparent movement of the sun across the sky in terms of the Earth's rotation and that this results in day and night [year 5].

Monitoring:

The monitoring of science is completed in the following ways:

- Analysing the pupils' work;
- Talking with the pupils alongside their work;
- Learning walks;
- Discussions with teachers and looking at short, medium term plans and the classroom environment;
- Looking at curriculum overviews to see teacher coverage;
- Talking to children about science and how it can impact on them in future career choices.

Links with other curriculum areas:

Science pervades every aspect of our lives and we will relate it to all areas of the curriculum. We will also ensure that pupils realise the positive contribution of both men

and women to science and the contribution from those of other cultures. We will not only emphasise the positive effects of science on the world but also include problems, which some human activities can produce. Science is closely linked to the Maths curriculum especially with the measuring, collecting and recording of data. The children are expected to use/ transfer their skills from other subjects such as English and History. ICT links are also developed when at all possible.

Spiritual, Moral and Cultural Development and PSHE:

At Scamblesby CE Primary School, we believe that Science can make an important contribution to these areas of a child's development. The science curriculum helps children to link their experiences and environment to that of the wider world.

Science is using evidence to make sense of the world, it helps us understand our relationship with the world around us (how the physical world behaves, the interdependence of all living things). Making new discoveries increases our sense of awe and wonder at the complexities and elegance of the natural world. For scientists, this is a spiritual experience and drives us onwards in our search for understanding. Children discuss the morals behind science, scientific discoveries and inventions need to be used responsibly, and decisions made based on evidence (not prejudice). As teachers, we encourage pupils to be both open minded (generating a hypothesis) and critical (demanding evidence) and to use their understanding of the world around them in a positive manner. Scientists share ideas, data, and results (for further testing and development by others) Sharing and discussion is a key principle of the scientific method. We encourage pupils to work together on scientific investigations and to share results (to improve reliability).

In Science lessons, we explore and celebrate research and developments that take place in many different cultures, both past and present. We explore how scientific discoveries have shaped the, beliefs, cultures and politics of the modern world.

Risk Assessments:

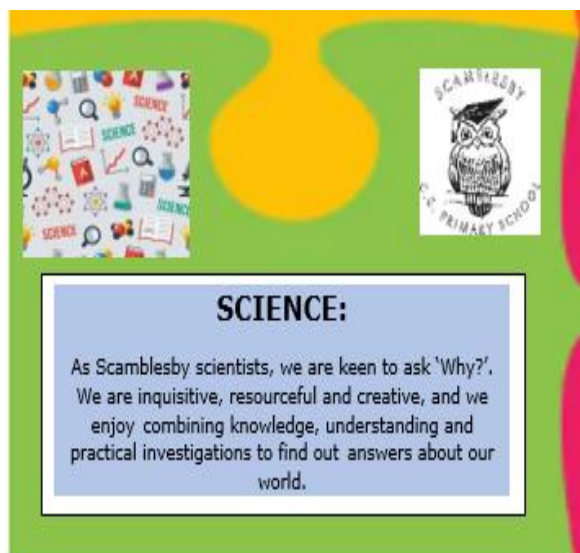
Pupils will be taught to use scientific equipment safely when using it during practical activities. Class Teachers and Teaching Assistants will check equipment regularly and report any damage, taking defective equipment out of action. Science equipment must be returned and stored safely.

When undertaking out of school activities, all health and safety guidelines will be complied with. Before undertaking a field trip, teachers are required to visit the proposed area of study and fill in a risk assessment form. Class teachers, with the support of the Educational Visits Co-ordinator, will upload their risk assessments using EVOLVE package. Staff are also encouraged to fill out the evaluation of trips using EVOLVE to ensure we are providing accurate feedback of field trips.

Any educational visits must follow the health and safety guidelines as above. In science we endeavour to provide as many experiences as possible for the children, this may include trips or visitors into the academy. We will also have a week of science activities where the whole academy is involved.

Pupil Voice / Pupil Subject Champions:

At Scamblesby CE Primary School, we take the voice and views of the children very seriously and strive to involve them in the teaching and learning process to aid understanding and develop a sense of ownership of their learning. Science, in common with the other curriculum subjects across the school, is represented by two Y5/6 subject champions, whose responsibilities include joining the Science Subject Leader with learning walks, discussing the subject with children across the school and ensuring that the opinions of the children are represented and discussed. The Science Subject Champions are given details of how the subject looks in our school, and contributed a 'pupil vision statement' for our curriculum jigsaw.





SCAMBLESBY CE PRIMARY SCHOOL: SCIENCE SUBJECT CHAMPION



As Scamblesby scientists, we are keen to ask 'Why?' .
We are inquisitive, resourceful and creative,
and we enjoy combining knowledge, understanding
and practical investigations
to find out answers about our world.

Working scientifically

- Work scientifically**
This concept involves learning the methodologies of the discipline of science.

Biology

- Understand plants**
This concept involves becoming familiar with different types of plants, their structure and reproduction.
- Understand animals and humans**
This concept involves becoming familiar with different types of animals, humans and the life processes they share.
- Investigate living things**
This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes.
- Understand evolution and inheritance**
This concept involves understanding that organisms come into existence, adapt, change and evolve and become extinct.

Chemistry

- Investigate materials**
This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.

Physics

- Understand movement, forces and magnets**
This concept involves understanding what causes motion.
- Understand the Earth's movement in space**
This concept involves understanding what causes seasonal changes, day and night.
- Investigate light and seeing**
This concept involves understanding how light and reflection affect sight.
- Investigate sound and hearing**
This concept involves understanding how sound is produced, how it travels and how it is heard.
- Understand electrical circuits**
This concept involves understanding circuits and their role in electrical applications.

Working scientifically Work scientifically This concept involves learning the methodologies of the discipline of science.	Biology Understand plants This concept involves becoming familiar with different types of plants, their structure and reproduction. Understand animals and humans This concept involves becoming familiar with different types of animals, humans and the life processes they share. Investigate living things This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes. Understand evolution and inheritance This concept involves understanding that organisms come into existence, adapt, change and evolve and become extinct.	Chemistry Investigate materials This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.	Physics Understand movement, forces and magnets This concept involves understanding what causes motion. Understand the Earth's movement in space This concept involves understanding what causes seasonal changes, day and night. Investigate light and seeing This concept involves understanding how light and reflection affect sight. Investigate sound and hearing This concept involves understanding how sound is produced, how it travels and how it is heard. Understand electrical circuits This concept involves understanding circuits and their role in electrical applications.
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Careers and Aspirations:

At the start of all science lessons, children will be reminded of what the subject is that is being taught. During each science unit, the children will also have the opportunity to research famous scientists past and present. Children will also have an opportunity to discuss the careers that involve a scientific background and the opportunity during 'Aspirations week' to find out more.

Review:

The Science policy is reviewed on a regular basis as part of our ongoing curriculum monitoring programme unless national initiatives deem it necessary to review it earlier.

Signed:

..... – Headteacher

Date:

..... - Chair of Governors

Date: