Barrow CEVC Primary School

Inspire, Create, Discover, Together

SCIENCE INTENT

Barrow CEVC Primary School

Inspire, Create, Discover, Together

INTENT

Science - Intent

At Barrow Primary School, we believe that a high-quality science education provides the foundations for understanding the world through the specific disciplines of Biology, Chemistry and Physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge, vocabulary and concepts, pupils are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They are encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Aims of the Science Curriculum

The national curriculum for science aims to ensure that all pupils:

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

Our Science curriculum is knowledge and vocabulary rich, ensuring children gain a deep understanding of fundamental scientific knowledge and concepts as well as embedding key science specific vocabulary and terminology (Tier 3 vocabulary). In addition, children are encouraged to develop their scientific curiosity and understanding by working scientifically.

Working Scientifically

Key Stage 1:

- Ask simple questions and recognise that they can be answered in different ways.
- Use simple equipment to observe closely.
- Perform simple tests.
- Identify and classify.
- Use his/her observations and ideas to suggest answers to questions.
- Gather and record data to help in answering questions.

Barrow CEVC Primary School

Inspire, Create, Discover, Together

INTENT

Lower Key Stage 2:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- Using straightforward scientific evidence to answer questions or to support their findings.

Upper Key Stage 2:

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

Spaced Retrieval Practice Approach

Our curriculum is delivered in modules, rotating through each subject area in Science, History, Geography, Computing, French, Art& Design and Design & Technology. All Science modules are identified using green boxes on our curriculum maps. Below is how our curriculum delivers (introduces and revisits) the National Curriculum expectations within and across year groups.

Barrow CEVC Primary School

Inspire, Create, Discover, Together

INTENT

Early Years

In Early Years, children are encouraged and guided to use investigation and exploration to develop their understanding of the world. Our curriculum is designed to enable children to make sense of their physical world and their community.
Children are encouraged to be scientists, to:

- Show curiosity and interest in the features of objects and living things
- Describe and talk about what they see
- Show curiosity about why things happen and how things work
- Show understanding of cause-effect relations
- Notice and comment on patterns
- Show an awareness of change
- Explain own knowledge and understanding, and ask appropriate questions of others
- Investigate objects and materials by using all of their senses as appropriate
- Find out about, and identify, some features of living things, objects and events they observe
- Look closely at similarities, differences, patterns and change
- Ask questions about why things happen and how things work

We are an Early Year Adopter school and follow the new framework to ensure that children develop a good understanding of the natural world around them, by:

- making observations and drawing pictures of animals and plants
- know some similarities and differences between the natural world around them and contrasting environments
- drawing on their experiences and what has been read in class
- understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Barrow CEVC Primary School

Inspire, Create, Discover, Together

INTENT

Reception Long Term Plan 21-22

Barrow CEVC Primary School

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
General Themes	Marvellous Me!	Do Cows Drink Milk? Celebrations!	Will You Read Me A Story?	Are We There Yet?	Wonderful Wildness!	Under The Sea!
Understanding the World RE / Festivals	Understanding the world involves guiding children to **make sense of their physical world and their community**. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.					
Our RE Curriculum enables children to develop a positive sense of themselves and others and learn how to form positive and respectful relationships. They will begin to understand and value the differences of individuals and groups within their own community. Children will have opportunity to develop their emerging moral and cultural awareness.	• identifying their family. Commenting on photos of their family, naming who they can see and of what relation they are to them. I can describe people who are familiar to me • Show interest in the lives of other people who are familiar to me • I can recognise that people have different beliefs and celebrate special times in different ways • Can talk about what they do with their family and places they have been with their family. Can draw similarities and make comparisons between other families. Name and describe people who are familiar to them. • I can show an interest in different occupations and ways of life • I can draw a simple map • I can talk about things I have observed such as animals • I show care for living things (pets) • I can ask questions about aspects of my familiar world such as the place where I live or the natural world REFLECTION TIME DAILY	• Guy Fawkes: compare and contrast character from stories, including figures from the past: looking at clothes • I can talk about significant events in my own experience • I can talk about why things happen: making bread • I can recognise and describe special times or events for family or friends REFLECTION TIME DAILY	• Use images, video clips, shared texts and other resources to bring the wider world into the classroom. Listen to what children say about what they see • Listen to children describing and commenting on things they have seen whilst outside, including plants and animals. • Celebrate Chinese New year • Recognising that people have different beliefs • Respecting difference Talk about lives of people around us • Talk about experiences at different points in the year (class calendar for each month) • Changing seasons: winter • ice experiments • Knowing there are different countries in the world (China) • I have explorTed: google earth • I understand the effects of changing seasons on the world around me REFLECTION TIME DAILY	• Similarities and differences between countries/environments • Maps of our journey to school/looking on Google Earth features of local environment, maps of local area comparing places on Google Earth: how are they similar/different? • Sea & Land • Naming human and physical features in the environment. • Space • I can describe special events • How things work/move • Reduce, reuse, recycle REFLECTION TIME DAILY	• Growth & Change: frog life cycle • I can show care and concern for living things in the environment • I can start to develop an understanding of growth, decay and changes over time • I can talk about some of the things I have observed such as plants, animals, natural and found objects • Growth & Change: chick life cycle • I can understand the key features of the life cycle of a plant and animal • I can tell you what a plant needs to grow (growing the beanstalk) REFLECTION TIME DAILY	Learn about what a palaeontologist is and how they explore really old artefacts. Introduce Mary Anning as the first female to find a fossil. • Materials: Floating / sinking – boat building Metallic / non-metallic objects • Seaside long ago – Magic Grandad compare and contrast past and present • Share non-fiction texts that offer an insight into contrasting environments. • Listen to how children communicate their understanding of their own environment and contrasting environments through conversation and in play. • I can draw information from a simple map • I can talk about ways in which I can look after the environment • Pirate maps (maps of school to find treasure) • Reduce, reuse, recycle REFLECTION TIME DAILY
Emmanuel Project	What makes every single person unique and precious? Which people are special and why? Being special: where do we belong? Belonging to their family. Which stories are special and why? Diwali Harvest Festival	Why do Christians perform nativity plays at Christmas? What times are special and why? Which stories are special and why? Christmas Bonfire Night Remembrance Sunday	Why is the word 'God' so important to Christians? What times are special and why? Chinese new year Shrove Tuesday	Why do Christians put a cross in the Easter garden? What times are special and why? Which stories are special and why? Easter & Mothering Sunday What places are special and why? Church at Easter	How can we help others when they need it? What is special about our world? Awe and wonder: growth and change of animals	How can we care for our wonderful world? What is special about our world? What is special about our world? Summer Solstice Fathers Day

EYFS to KEY STAGE ONE

Barrow CEVC Primary School

Inspire, Create, Discover, Together

INTENT

Specific Area of Learning	ELG's	How this is achieved in EYFS	Science KS1	
			Year 1	Year 2
Understanding the World	**ELG 2** **Managing Self** · Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. **ELG 14** **The Natural World** · Explore the natural world around them, making observations and drawing pictures of **animals** and plants	· Discussions at snack time of the importance of healthy food choices. · During lunch time discussions. · Through stories and circle time discussions. E.g The story – Now wash your hands and Funnybones. · P.E lessons that encourage getting dressed and undressed independently. · Naming body parts through songs – Heads, shoulders, knees and toes. · **RSE link** – Correct naming of body parts. · Talking about pets at home. · Exploring minibeasts and recording our observations. ·	Animals, including humans	
	ELG 14 **The Natural World** · Explore the natural world around them, making observations and drawing pictures of **animals and plants.**	· Going on walks to observe the local environment and to compare and learn about the seasons. · Taking photos to compare seasons and discuss. · Planting seeds and plants · Looking after the EYFS garden. · Creating bug hotels	Plants	
			Seasonal changes	Living things and their habitats.
	ELG 14 **The Natural World** · Understanding some important processes and changes in the natural world around them, including seasons and changing states of matter.	· Growing plants from bulbs and seeds. · Making boats to explore best materials. · Water tray activities to explore water, ice, and materials that float and sink. · Testing the best material for	Everyday materials	Uses of everyday materials

Barrow CEVC Primary School

Inspire, Create, Discover, Together

INTINT

SCIENCE National Curriculum Expectations KS1	Year 1		
	Autumn	Spring	Summer
Plants • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees.	Introduce Revisit	Revisit	Revisit
Animals, including humans • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Introduce	Introduce and Revisit	Revisit
Everyday materials • distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on the basis of their simple physical properties.			Introduce
Seasonal changes • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies.	Introduce		Revisit

Barrow CEVC Primary School

Inspire, Create, Discover, Together

INTENT

CUSPA

SCIENCE National Curriculum Expectations KS1	Year 2		
	Autumn	Spring	Summer
1. Living things and their habitats • explore and compare the differences between things that are living, dead, and things that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including micro- habitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.	Introduce Revisit		Revisit
Plants • observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.		Introduce	Revisit
Animals, including humans • notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.			Introduce
Uses of everyday materials • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Introduce Revisit		

Barrow CEVC Primary School

Inspire, Create, Discover, Together

INTINT

CUSPA

SCIENCE National Curriculum Expectations Year 3	Year 3		
	Autumn	Spring	Summer
3. Plants • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • 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.			Introduce
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.	Introduce		
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.	Introduce Revisit		
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 an opaque object • find patterns in the way that the size of shadows change.		Introduce	
Forces and magnets • compare how things move on different surfaces • notice that some forces need contact between two objects, but magnetic forces can act at a distance • observe how magnets attract or repel each other and attract some materials and not others • compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials • describe magnets as having two poles • predict whether two magnets will attract or repel each other, depending on which poles are facing.		Introduce	

SCIENCE National Curriculum Expectations Year 4	Year 4		
	Autumn	Spring	Summer
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.	Introduce		
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.		Introduce	
States of matter • compare and group materials together, according to whether they are solids, liquids or gases • observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.			Introduce
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.			Introduce
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.	Introduce		

Barrow CEVC Primary School

Inspire, Create, Discover, Together

INTENT

CUSPA

SCIENCE National Curriculum Expectations Year 5	Year 5		
	Autumn	Spring	Summer
Living things and their habitats Pupils should be taught to: • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in some plants and animals	Introduction Revisit		
Animals, including humans Pupils should be taught to: • describe the changes as humans develop to old age		Introduce	
Properties and changes of materials Pupils should be taught to: • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • demonstrate that dissolving, mixing and changes of state are reversible changes • explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda			Introduce
Earth and space Pupils should be taught to: describe the movement of the Earth and other planets relative to the sun in the solar system describe the movement of the moon relative to the Earth describe the sun, Earth and moon as approximately spherical bodies use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky		Introduce Revisit	
Forces Pupils should be taught to: • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effects of air resistance, water resistance and friction, that act between moving surfaces • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect			Introduce

Barrow CEVC Primary School

Inspire, Create, Discover, Together

INTENT

SCIENCE National Curriculum Expectations Year 6	Year 6		
	Autumn	Spring	Summer
Living things and their habitats Pupils should be taught to: • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • give reasons for classifying plants and animals based on specific characteristics	Introduce		
Animals including humans Pupils should be taught to: • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function (Summer) • describe the ways in which nutrients and water are transported within animals, including humans (Summer)		Introduce	Introduce water transport
Evolution and inheritance Pupils should be taught to: • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution			Introduce
Light Pupils should be taught to: • recognise that light appears to travel in straight lines • use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	Introduce		
Electricity Pupils should be taught to: • associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • use recognised symbols when representing a simple circuit in a diagram		Introduce	