



Keresforth Primary School

Science Policy

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Teaching Science

At Keresforth Primary we believe that the best science teaching fosters and develops pupils' curiosity in the subject whilst also helping them to fulfil their potential. For our pupils to achieve well in science, they need to acquire the necessary scientific knowledge and also be able to enjoy the experience of engaging and purposeful scientific enquiry in order to help them to answer scientific questions about the world around them.

The new National Curriculum 2014 states why we teach science in schools: 'A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics...Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena.'

We believe Science teaching at Keresforth Primary is good when:

- It is practical and engages the children
- The children are involved in 'hands on learning'
- Children feel able to question the 'how and why'
- There is a hook to draw the children in
- The outside environment is used as much as possible
- Children create their own questions
- Investigations are carried out for each unit of learning

- There are opportunities to apply their learning in other contexts
- There is a 'wow' factor to their learning

Through science in our school we aim to:

- Encourage the development of positive attitudes to science.
- Deliver the National Curriculum Science programmes in ways that are imaginative, purposeful, well controlled and enjoyable.
- Help in developing and extending the children's scientific concept of their world and encouraging them to ask deeper questions about the world around them.
- Deliver clear and accurate teacher explanations and skilful questioning. Providing guidance but at the same time allowing children the freedom to explore as independently as possible.
- Make strong, purposeful links between science and other subjects. Using ICT in a meaningful way to extend their learning (Data Loggers, video, photography and microscopes).
- Develop the use of scientific language, recording and techniques.
- Enable children to become effective communicators of scientific ideas, facts and data whilst becoming experts at analysing the data they collect.
- Develop the following skills of investigation – observation, measuring, predicting, hypothesising, experimenting, communicating and interpreting.

Objectives

In order to achieve this, our role as teachers is crucial, we need to:

- Stimulate an interest in the collection of materials for observation, investigation and ordering using the five senses for discovery and

awareness of themselves.

- To provide first-hand experience and encourage discussion around ideas and ways of using and finding out about tangible things.
- Widen pupils' vocabulary by the introduction of scientific language and encouraging the correct use of these words.
- Develop in pupils, over time, the ability to predict, estimate and develop their powers of questioning.
- Introduce pupils to different methods of recording so that over time they may learn how to record in the most suitable way what has been done and discovered.
- Develop in children the confidence and ability to form a conclusion, based upon evidence.

Aims

Through high-quality science teaching, we aim to help our pupils understand how major scientific ideas have played a vital role in society. Moreover, we aim to prepare our pupils for life in an increasingly scientific and technological world.

We aim to do this by:

- Delivering high quality, interesting and engaging science lessons
- Using scientific contexts to develop and consolidate cross curricular skills in English, Maths and Computer Science
- Developing and extending pupils' scientific knowledge and understanding
- Developing pupils' ability to work scientifically and involve pupils in planning, carrying out and evaluating investigations

- Developing pupils' scientific vocabulary and ability to articulate scientific concepts clearly and precisely

Teaching and Learning

At Keresforth Primary, teachers plan and deliver high-quality and engaging science lessons incorporating a range of teaching and learning styles. We will provide opportunities for pupils to:

- Learn about science, where possible, through first-hand practical experiences;
- Develop their research skills through the appropriate use of secondary sources;
- Work collaboratively in pairs, groups and/or individually;
- Plan and carry out investigations with an increasing systematic approach as they progress through the school;
- Develop their questioning, predicting, observing, measuring and interpreting skills;
- Record their work in a variety of ways e.g. writing, diagrams, graphs, tables;
- Read and spell scientific vocabulary appropriate for their age.
- Be motivated and inspired by engaging and interactive science displays which include key vocabulary and relevant questions.
- Learn about science using the outdoor learning environment.

The Science Curriculum

Planning for learning:

Long term planning is on a straight year group plan - **Appendix A**

Medium term planning will be done using the agreed school format. When planning a unit of work children should be given the opportunity to:

- Develop scientific skills from first- hand experience
- Develop attitudes appropriate to working scientifically
- Develop scientific concepts, starting from the view the children hold, giving them the opportunities to change their views and ultimately their understanding
- Apply scientific ideas to real life problems work co-operatively
- Explore their curiosity and understand the world about them
- Use safe and simple equipment
- Teaching strategies will include individual, group work and whole class teaching
- Full use will be made of the local environment and other environmental resources and where applicable school visits will be utilised to provide opportunity for enriching the scientific experiences of pupils
- Strategies will be adopted to ensure that all children have equal opportunities to access the science curriculum, regardless of gender, race, class, physical or intellectual ability
- Learning objectives clear with appropriate activities found to deliver them
- Range of strategies used to promote learning
- Use of assessments to inform curriculum planning
- High expectations and challenge

Resources

Practical science resources are based in 2 cupboards in the main store room off the hall, in addition to the shelving also in the PE store. The cupboards and shelves are labelled and divided into biology, chemistry and physics resources. There are also yellow, portable storage boxes with whole class resources for topics such as electricity and forces.

Scientific enquiry resources are also located on trolleys and above the shelves in the main store off the hall.

Individual teachers are responsible for ensuring that children know how to use equipment correctly, that it is treated with respect and that it is returned in good working order to its storage place.

They are also responsible for informing the subject-leader of any consumables or breakages that need replacing and of any materials which we need and do not have available.

Assessment, recording and reporting

- Children's achievements and attainment will be identified through colour coded highlighting of the topic's objectives and working scientifically objectives. These then build up to build a picture of the child's attainment in science.
- Marking and feedback will be as in the marking and feedback policy but incorrectly spelt scientific vocabulary should be identified.
- Knowledge organisers are used to assess children's understanding and address any misconceptions they may have. They are used to help understand specific vocabulary for each topic.

Environmental Awareness

At Keresforth we realise the importance of teaching our pupils to care for the environment. The school will continue to recycle waste paper and ink cartridges. Our extensive school grounds provide areas where children can study minibeasts and habitats, including a pond. They are taught the importance of their impact on the environment and can use the area for studying plants, ponds and other micro habitats.

Equal Opportunities

At Keresforth we work to ensure that all children have the opportunity to gain scientific knowledge and understanding regardless of gender, race, class, physical or intellectual ability. We will ensure that expectations do not limit pupils' achievements and that assessments do not involve any cultural, social, linguistic or gender bias.

Health and Safety

- The teacher should be clear as to the purpose of the work and ensure that any testing that needs to be carried out complies with the Health and Safety procedures and has been practised prior to the lesson.
- Safety hazards should be pointed out to the children at the beginning of any work.

Science Appendix A

Y 1	Animals, including humans	Everyday materials	Plants	Seasonal changes	
	- 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	- 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	- 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.	- Observe seasonal changes and the weather associated with each season - Understand how day length varies. - Find out which areas have the same season as us and where in the world things are not the same. - Explore how places in the Southern Hemisphere	

	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	group together a variety of everyday materials on the basis of their simple physical properties.		re have the opposite season to us.	
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	and label the basic parts of the human body and say which part of the body is associated with each sense.				
Y 2	Uses of everyday materials Identify and compare the suitability of a variety of everyday materials, including wood,	Animals, including humans Notice that animals including humans have offspring which grow into adults	Living things and their habitats Explore and compare the differences between things that are living, dead,	Plants - Observe and describe how seeds and bulbs grow - Find out and describe how plants	

	metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out the shape of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	- Find out 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.	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	need water, light and suitable temperatures to grow and stay healthy.	
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			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		
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			name different sources of food		
Y 3	Light - recognise that they need light in order to see things and that dark is the absence of light. - Notice that light from the sun can be dangerous and that there are ways to protect their eyes. - Recognise that shadows are formed	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	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 magnet	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	Animals, including humans - identify that animals, including humans, need the right types and amount of nutrition/exercise, 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

	when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change. •	• recognise that soils are made from rocks and organic matter. •	s 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.	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.	support, protection and movement.
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			• Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing.		
Y 4	Sound • identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from	States of Matter • compare and group materials together, according to whether they are solids, liquids or gases	Electricity • identify common appliances that run on electricity • construct a simple series electrical	Living things and their habitats • Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys to	Animals, including humans • Describe the simple functions of the basic parts of the digestive system in humans. • Identify the different

	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	• 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.	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	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.	types of teeth in humans and their simple functions. • Construct and interpret a variety of food chains, identifying producers, predators and prey.
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	source increases.		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.		
Y 5	Forces • Explain that	Properties and changes of materials	Living things and their	Animals, including humans	Earth and Space

	unsupported objects fall towards the Earth because of a 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,	- 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	habitats - Describe the differences in the lifecycles of a mammal, an amphibian, an insect and a bird. - Describe the life processes of reproduction in some plants and animals	Describe changes as humans develop to old age.	- 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
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	allow a smaller force to have a greater effect.	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			across the sky.
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		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			
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		associate d with burning and the action of acid on bicarbon ate of soda.			
Y 6	Animals, including humans - Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. - Recognise the impact of diet,	Living things and their habitats Describe how living things are classed into broad groups according to common, observable characteristics and based on similarities and differences including	Evolution and inheritance Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions	Light - Recognise that light appears to travel in straight lines. - Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye - Explain that we see things	Electricity - Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. - Compare and give reasons for variations in how

	exercise, drugs and lifestyle on the way their bodies function. • Describe the ways in which nutrients and water are transported within animals, including humans.	micro-organisms and plant and animals. • Give reasons for classifying plants and animals based on specific characteristics.	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	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.	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.
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			that adaptat ion may lead to evolutio n.		
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