

Generic INTENT

Vision		Mission
*An inspirational, stimulating and well-resourced environment *A safe and secure school at the heart of the community *Inquiry, independence and enthusiasm for learning		*Preparing all children for life *A high quality professional team *Taking pride in all our achievements *High standards of behaviour Where every child counts
Excellent teaching gives children the life chances they deserve...Enjoyment is the birthright of every child. The most powerful mix is the one that brings the two together. Children learn better when they are excited and engaged – but what excites and engages them best is truly excellent teaching. Education is for all, not the few. All children have the right to be the best they can be. We foster a love of learning and the development of the well-rounded child.		
Preparing Children for Life We believe that we are preparing children for 21 st Century life. We aim for them to be independent thinkers, confident learners and global citizens, equipped to live and work in and contribute to the global economy.		
<u>Aims and Objectives</u> <u>At William Barnes Primary School, we believe that children deserve:</u> <ul style="list-style-type: none"> To be set appropriate and stimulating learning challenges To be taught well and be given the opportunity to learn in ways that maximise the chances of success To be given quality feedback which highlights successes and areas for improvement. To have adults working with them to tackle the specific barriers to progress they face. <u>It is also our aim that :</u> <ul style="list-style-type: none"> Children develop a lasting love of all aspects of learning which will aid and enhance their further education and life. Children are given the opportunity to experience the widest variety of the written and spoken word possible - a vocabulary rich curriculum and school experience. This includes trips to pantomimes, art galleries and orchestral concerts. Children develop a healthy lifestyle this is supported by Active Learning, The Daily Mile, Wake and Shake and a robust healthy eating policy. 		
<u>Knowledge and Skills</u> As a school, we believe in the equal relationship between knowledge and skills in our curriculum. We believe that: <ul style="list-style-type: none"> Knowledge can be declarative (to know that) or Procedural (to know how). Both these forms are important and that Declarative knowledge is turned into Procedural knowledge through action and the act of applying. Skills can be Procedural knowledge as a result of the application of Declarative knowledge. Skills can be linked to dispositions and behaviours. In short, skills often procedural knowledge and are linked intrinsically to declarative knowledge. We prefer to see the debate laid out as: <div style="text-align: center;"> Knowledge → Comprehension → Application → Evaluation </div>		
<u>Global Community</u> We aim to equip our children for living in, and contributing to, a secure, transformative and sustainable world.		<u>Parents</u> “For all children, the quality of the home learning environment is more important for intellectual and social development than parental occupation, education and income. What parents do is more important than who parents are.” (EPPE)

INTENT

Vision and Mission

At William Barnes the science policy operates within the wider context of the school vision and mission statement.

Current Practice

Science is a core subject in the National Curriculum. This policy outlines the purpose, nature, management and assessment of science as taught in William Barnes Primary School.

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 and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Aims

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.

Objectives

- To develop investigative skills through asking question and deciding how to find answers.
- To develop the means of obtaining and presenting evidence articulately.
- To develop curiosity and a questioning attitude towards evidence and results.
- To enhance personal and social skills by co-operating with peers during practical activities and the sharing and discussing of ideas or results.
- To use the process of “raising and attempting to answer questions, collating information, communication of findings to put a formative frame work of understanding on our world”

OVERVIEW

Science Objectives 2014 Curriculum

Year Group	Autumn 1	Autumn 2
1	Animals including Humans: <ul style="list-style-type: none"> Identify, name draw and label the basic parts of the human body and say which part of the body is associated with each sense. 	Seasonal Changes: <ul style="list-style-type: none"> Observe changes across the four seasons. Observe and describe weather associated with the season and how day length varies. <i>(started in Aut 2 – but runs throughout the year).</i>
2	Living Things and their Habitats: <ul style="list-style-type: none"> 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. 	
3	Rocks: <ul style="list-style-type: none"> 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. 	Light: <ul style="list-style-type: none"> 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.
4	Electricity: <ul style="list-style-type: none"> 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. 	Animals including Humans: <ul style="list-style-type: none"> 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.
5	Properties and Changes of Materials: <ul style="list-style-type: none"> 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. 	Earth and Space: <ul style="list-style-type: none"> 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.
6	Light: <ul style="list-style-type: none"> Recognise that light appears to travel in straight lines & use the idea that light travels in straight lines to explain that 	Evolution and Inheritance <ul style="list-style-type: none"> Recognise that living things have changed over time and that fossils provide information about living things that inhabited

	<p>objects are seen because they give out or reflect light into the eye</p> <ul style="list-style-type: none"> 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. 	<p>the Earth millions of years ago</p> <ul style="list-style-type: none"> 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.
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Year Group	Spring 1	Spring 2
1	Everyday Materials: <ul style="list-style-type: none"> 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. 	Animals including Humans: <ul style="list-style-type: none"> Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets. 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
2	Uses of Everyday Materials: <ul style="list-style-type: none"> 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. 	
3	Animals including Humans: <ul style="list-style-type: none"> 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. 	
4	State of Matter: <ul style="list-style-type: none"> 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. 	
5	Forces: <ul style="list-style-type: none"> 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. 	
6	Animals including Humans: <ul style="list-style-type: none"> 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. Describe the ways in which nutrients and water are transported within animals, including humans. 	Electricity <ul style="list-style-type: none"> 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.

Year Group	Summer 1	Summer 2
1	Plants: <ul style="list-style-type: none"> 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. 	
2	Plants: <ul style="list-style-type: none"> 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. 	Animals including Humans: <ul style="list-style-type: none"> 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.
3	Plants: <ul style="list-style-type: none"> 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. 	Forces and Magnets: <ul style="list-style-type: none"> 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.
4	Sound: <ul style="list-style-type: none"> 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. 	Living things and their habitats: <ul style="list-style-type: none"> 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.
5	Animals including Humans: <ul style="list-style-type: none"> Describe the changes as humans develop to old age. 	Living Things and their Habitats: <ul style="list-style-type: none"> 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.
6	Living Things and Their Habitats: <ul style="list-style-type: none"> 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. 	

World	World	
30-50 months	40-60 months	ELGs are an end of Foundation Stage assessment. They may be used during the year as a prediction of EYFS attainment.
<ul style="list-style-type: none"> Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. Can talk about some of the things they have observed such as plants, animals, natural and found objects. Talks about why things happen and how things work. Developing an understanding of growth, decay and changes over time. Shows care and concern for living things and the environment. 	<ul style="list-style-type: none"> Looks closely at similarities, differences, patterns and change. 	<p><u>Expected</u> Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.</p> <p><u>Exceeding</u> Children know that the environment and living things are influenced by human activity. They can describe some actions which people in their own community do that help to maintain the area they live in. They know the properties of some materials and can suggest some of the purposes they are used for. They are familiar with basic scientific concepts such as floating, sinking, experimentation.</p>

IMPLEMENTATION

How We Teach

Statement of Current Practice

1. Long and medium term planning is created by class teachers and overseen by the Science Leader.
2. To create long/medium term plans teachers refer to a variety of published schemes including QCA, Scholastic and 365 Science Lessons. Twinkl is also used for the basis of some medium and long term planning and weekly planning as well.
3. Weekly planning follows an agreed proforma.
4. Teachers break down the broad learning objectives in the curriculum into smaller, lesson by lesson learning intentions. Success Criteria are then devised for and by the children.
5. Teacher's planning is given to the Headteacher at the beginning of a term/week.
6. Teacher's plan cross curricular links using the Connected Curriculum planning document.
7. Staff are encouraged to use a "hands on" practical approach to science and children are continually encouraged to think logically, test ideas fairly and be prepared to analyse their results especially when the unexpected happens.
8. The Leader is available to help with ideas for planning (medium or short term), to help with information regarding the location or provision of equipment and methods of recording.
9. The Leader organises a Science Week on a 2 year cycle to ensure a high profile of Science is maintained. (*March 2015, March 2017, March 2019*).
10. The school promotes STEM subjects by working with a polar explorer and being part of the Enthuse project for 2020/21.

Reading/Vocabulary/Oracy

We believe reading to be the very bedrock for learning. Reading development is considered at every learning opportunity and opportunities for developing the reading practice of children and parents are constantly being updated. We are constantly evaluating new and existing strategies for encouraging home reading.

Time is given to vocabulary development within all subjects and children are encouraged to question new vocabulary at any opportunity. As stated before, we run our own Oracy Project, which supports the catch up process for young children with a vocabulary gap.

Support

There are regular staff meetings for the science Leader to update staff.
The coordinator liaises with other coordinators in the pyramid.
The school has participated in the Polar exploration scheme
The school is part of the Enthuse STEM pyramid project for 2020/21
The school has the science dome every two years for the whole school

Parents

At William Barnes Primary School, we believe that parents and teachers working together is highly beneficial to long term quality learning.

Parents are invited in for activities in Family Learning Weeks and for Science week.

IMPACT

Assessment

Summative assessment

Assessment

Staff are encouraged to annotate planning to show which children have exceeded the learning intention and those who have not achieved the learning intention. At the end of each unit children take a quiz to assess their knowledge which can be used to decide whether a child is exceeding, at ARE or working towards ARE for that particular unit of study. Teachers complete tracking of National Curriculum 2014 objectives on Educator Online and use this and the outcomes of the quizzes to inform their judgements at the end of every term. The judgements at the end of each term are then used to determine an overall judgement for the end of year and this is recorded in Educator.

Teachers use AfL strategies to monitor children progress in lessons and over time. All teachers are required to report on every child's achievements and progress in science in the form of an end of school year report. Assessment in Year 6 may take the form of sample testing.

Formative Assessment

AFL strategies are embedded across the school and several strategies/beliefs apply to the ongoing assessment of science.

Personalised intervention time is given as immediate feedback to individuals requiring it as well as to Pupil Premium children in dedicated time.

The use of visualisers for immediate, within lesson feedback is used throughout the school.

Random questioning in science lessons is used to support assessment of understanding and to promote engagement.

When marking work, teachers highlight in pink key vocabulary when the children use it correctly.

Misconceptions are highlighted in green, and teachers comment on the overall quality of the learning from time to time.

Multicultural/ Equal Opportunities

In accordance with our equal opportunities policy, all children regardless of race, gender or ability should have equal access to the science curriculum at William Barnes School. The Science National Curriculum states that science is an opportunity to promote the pupils' spiritual, moral, social and cultural development.

Resources

The science equipment is kept in the resources room in labelled trays. There is a selection of teachers' books available in the resources room and books suitable for the children in the staff room. The equipment is audited regularly by the co-ordinator.

Monitoring

The Leader is responsible for monitoring coverage, continuity and progression in the subject. Class teachers plan and organise deepening activities for more able children. Evidence of these activities is collated in Science Deepening Folders, held in each class, which are monitored by the Science Leader. The SLT scrutinise science planning and books termly.

Adopted date:	<i>28th July 2021</i>
Signature of Headteacher:	<i>Karen Wrixon</i>
Signature of Governing body:	<i>Cliff Walters</i>
Next review date	<i>Summer 2022</i>