



KINETON GREEN PRIMARY SCHOOL

SCIENCE POLICY

March 2021
(revise 2024)

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Kinton Green Primary School's Learning Intent

Pupils' learning and development is at the heart of our school's curriculum. Our intent is to create a safe, enjoyable and exciting community in which every person is valued and encouraged to explore their potential in an infinitely changing world. Underpinning this are our values of respect, safety, trust, confidence and engagement in learning through a broad and balanced curriculum.

1. Our intent for teaching Science

Science is a body of knowledge built up through experimental testing of ideas. Science is also methodology, a practical way of finding reliable answers to questions we may ask about the world around us. Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying process skills.

Our aims in teaching science include the following:

- To stimulate and excite pupils' curiosity and develop their interest in, and knowledge of, phenomena and events of the world around them
- To offer a range of activities which can engage all learners by linking direct practical experience with ideas, encouraging critical and creative thinking.
- Preparing our children for life in an increasingly scientific and technological world.
- Fostering concern about, and active care for, our environment.
- Helping our children acquire a growing understanding of scientific ideas.
- Helping develop and extend our children's scientific concept of their world.
- Developing our children's understanding of the international and collaborative nature of science.

Attitudes:

- Encouraging the development of positive attitudes to science.
- Building on our children's natural curiosity and developing a scientific approach to problems.
- Encouraging open-mindedness, self-assessment, perseverance and responsibility.
- Building our children's self-confidence to enable them to work independently.
- Developing our children's social skills to work cooperatively with others.
- Providing our children with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to study science further.

Skills:

- Giving our children an understanding of scientific processes.
- Helping our children to acquire practical scientific skills.
- Developing the skills of investigation - including observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.

- Developing the use of scientific language, recording and techniques.
- Developing the use of ICT in investigating and recording.
- Enabling our children to become effective communicators of scientific ideas, facts and data.

1.1 How Science Promotes the School's Mission Statement and Values

At Kineton Green we value honesty, encourage responsibility and respect each member of the community and the world around us. Our community is one where learning can take place and all can achieve success.

In our teaching of Science we aim to :-

- widen each child's experience, knowledge and understanding of the world by helping pupils develop lively, enquiring minds; encouraging them to engage in questioning and discussion about Science-based issues which affect their lives, the society in which they live and the world as a whole. Children learn how technologies based on Science have been used in industry, business and medicine, and how these developments have contributed greatly to the quality of life for most people
- develop an independent approach to personal needs and learning whilst acquiring self-confidence and self-discipline, through expressing views and evaluating decisions about Science related matters
- encourage co-operation, sensitivity and tolerance of each other by a practical approach to activities within the classroom.
- encourage parents to take an active part in the process of investigation and learning.

Our school values, the 5 Golden Bees, underpin all teaching and learning at Kineton Green, and encourage children to:

- Be a Lifelong Learner
- Be Safe and Healthy
 - Be Confident
 - Be Respectful
- Be Trustworthy and Honest

2. Implementation

2.1 The Place of Science in the Curriculum

The Foundation Stage

In Foundation Key Stage, specific Science teaching and exploration is planned in as part of the area of learning called, 'Understanding of the World'. In this area of learning, pupils are

developing the crucial knowledge, skills and understanding that help them to make sense of the world. Pupils will have opportunities to use scientific enquiry skills to experiment, predict, plan and question in a variety of context. The knowledge and skills they learn from exploration will form the foundations for their work in Science in future years.

Key Stage 1 and Key Stage 2

Science is a core subject within the National Curriculum. The National Curriculum programmes of study for science are set out year-by-year for Key Stages 1 and 2.

Key Stage 1

The principle 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. To demonstrate this, pupils should be able to:

- develop their understanding of science ideas through different scientific enquiry skills. *This may include, observing changes over a period of time, noticing patterns, grouping and classifying things and carrying out simple comparative tests.*
- use simple scientific language to talk about what they have found out to different audiences.
- Have opportunities for first-hand practical experiences.
- Use appropriate secondary sources, such as books, photographs and videos.

Lower Key Stage 2 – Years 3 and 4

The principle focus of Science teaching in Lower Key Stage 2 is enable pupils to broaden their scientific view of the world around them. To demonstrate this, pupils should be able to:

- explore, discuss, test and develop ideas about everyday phenomena.
- develop ideas about the relationships between living things and familiar environment.
- ask their own question about what they observe.
- Make 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.
- draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.
- use scientific vocabulary correctly in discussions and written work.

Upper Key Stage 2 – Years 5 and 6

The principal focus of science teaching in **upper Key Stage 2** is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. To demonstrate this, pupils should be able to:

- explore and discuss their ideas by asking their own scientific questions
- analyse different functions, relationships and interactions using a systematic approach.
- Encounter abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates
- 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. recognise that scientific ideas change and develop over time.

- 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.

Crucially, throughout each unit of work, children have planned opportunities to use a range of practical scientific methods, processes and skills. This 'Working Scientifically' criteria is outlined in the National Curriculum for each year group (Appendix 3)

By the end of each key stage, pupils will be expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study. During the year, staff will regularly complete assessments as to whether the children are working towards, have met, or exceeded these objectives.

2.2 Science structure in school

Science is taught as part of the integrated curriculum throughout the Foundation Stage.

In Key Stage 1 and 2, teachers block periods of time within a term to teach programmes of study. Class teachers continue to seek opportunities to make cross curricular links, where possible (appendix 1).

The school uses a Creative Curriculum to plan exciting learning opportunities for pupils. There is a different theme or topic every half term and science will be linked through these where possible and relevant. The Science lead has created medium term plans using the National curriculum objectives for each year group ensuring progression between year groups and topics, with opportunities to revisit, built upon and embed key aspects of learning. Within each programme of study, there is a range of scientific enquiry activities that teachers use to support the application and development of pupils' knowledge and understanding, including the correct use of scientific vocabulary. This will be used to help inform teacher assessments.

2.3 Planning in Science

Planning for science is a process in which all teachers are involved to ensure that the school gives full coverage of the National Curriculum for Science and science in the Foundation stage. When planning, we aim to incorporate as much practical scientific enquiry into our lessons as possible. Opportunities for cross-curricular skills are built in and taken advantage of (Appendix 1), meaning that skills and knowledge are developed and supported at other times. Science teaching in the school is about excellence and enjoyment and teachers are expected to adapt and modify plans to suit their children's interests, current events, their own teaching style, the use of any support staff and the resources available.

Units of work for each year group have been planned around curriculum topics. Currently, teachers are using Developing Experts, Twinkl Science and Engaging Science. Teachers use these schemes to support the planning, teaching and assessment for the programmes

of study based on the needs and abilities of the pupils in their class for an inclusive curriculum.

Ongoing assessment against learning objectives for year groups are completed using a tracking system and should be used to inform planning across the year. Records are kept to support future class teachers.

Weekly, short-term planning and classroom organisation are the responsibility of class teachers, working in consultation with the subject leader.

In the short term planning, teachers are expected to include the following:

- learning objective
- success criteria which is differentiated with the use of Must, Should and Could.
- the use of 'additional to' for pupils who may need resources/work adapted to enable pupils to access and achieve the learning objective.
- the use of 'different from' including the work that pupil/s will be completing
- How extra adults will be used in lesson if they are available.
- The resources needed for a scientific enquiry activity and identification of any health and safety risks.

During the completion of the short term planning, teachers are to refer to the medium term plans (appendix 2) and the curriculum progression map (appendix 4) to support the teaching and learning for the programme of study based on their pupils needs.

3. Impact

3.1 Feedback and Assessment

We use assessment to inform and develop our teaching.

Assessments are made in a variety of ways, which include pupils drawing, writing and discussion as well as the teacher's observation of their practical skills and attitudes.

We assess for learning (AfL). Children are involved in the process of self-improvement, recognising their achievements and that of their peers and acknowledging where they could improve. Activities during, and at the end of, each topic record achievement and celebrate success. For example, children at Key Stage 2 might self-mark completed work with 'three stars and a wish' - identifying three good points in their work and one in which they could improve.

When discussing and marking pupils' work we do so positively, endeavouring to ensure that any teacher comments are also linked to the identified LO. We make it clear verbally, or on paper, where the work is good, and how it could be further improved. Teachers can identify success criteria in a pupil's work by highlighting it in green and identify any misconceptions in yellow. It is expected that a teacher addresses any misconceptions with the child, either verbally or via a written comment, as soon as possible.

To ensure that the quality of literacy is considered when marking pupil work, staff are asked to regularly use 'pink for think', picking up on scientific spelling errors or grammatical errors within a piece of writing.

At the end of each unit of work, teachers assess a child's progress against year group objectives for what has been taught. They will identify whether a child is 'working towards', 'secure' or 'exceeding' within each objective. This information can be used by the subject co-ordinator and year group teacher to inform future planning to ensure progression of all children.

Teachers are expected to keep a record of the progress of all pupils up to date throughout the year. Regular moderation of science work occurs regularly within both the school and within the local authority to ensure there is consistency in science assessment across the key stages.

Verbal reports are given at parents evening during autumn and spring terms and written reports are made at the end of an academic year, describing each child's attitude to science, his/her progress in scientific enquiry and understanding of the content of science.

The school science coordinator monitors the teaching and learning of science across the school through a range of activities that include sampling children's work at regular intervals, taking learning walks around the school, discussions with pupils, reviewing teacher planning and teacher assessments.

4. Resources

Practical resources for Science are stored in a central area. Books and media resources are catalogued and stored in the library. All resources are sorted into units and clearly labelled.

5. Equal Opportunities

Science is taught within the guidelines of the school's equal-opportunities policy.

- We ensure that all our children have the opportunity to gain science knowledge and understanding regardless of gender, race, class, physical or intellectual ability.
- Our expectations do not limit pupil achievement and assessment does not involve cultural, social, linguistic or gender bias.
- We aim to teach science in a broad global and historical context, using the widest possible perspective and including the contributions of people of many different backgrounds.
- We draw examples from other cultures, recognising that simple technology may be superior to complex solutions.
- We value science as a vehicle for the development of language skills, and we encourage our children to talk constructively about their science experiences.
- In our teaching, science is closely linked with literacy and mathematics.
- We recognise the particular importance of first-hand experience for motivating children with learning difficulties.
- We recognise that science may strongly engage our gifted and talented children, and we aim to challenge and extend them.
- We exploit science's special contribution to children's developing creativity; we develop this by asking and encouraging challenging questions and encouraging original thinking.

We have particular regard for gender issues, aiming to dispel the myth of a scientist being a MAN in a white coat! Our resources reflect the diversity of the school, locality and nation.

6. Inclusion

Kineton Green School values all pupils and celebrates diversity of experience, interest and achievement. We believe that all children have a common entitlement to a broad and balanced academic and social curriculum. In keeping with our ethos and 'Five Bees' we believe that all children should be equally valued in school and strive to develop in an environment where all children can flourish.

This does not mean that we treat all children the same way, but will respond to each in ways which take account of their varied life experiences and needs. In line with the Special Educational Needs and Disabilities Policy staff will, using assessment, take into account pupils' strengths and barriers to ensure that learning opportunities are purposeful for all via the use of 'additional to' and/or 'different from' provision.

Refer to Special Educational Needs and Disabilities Policy for further details.

7. Home/School Links

- A curriculum booklet or science overview for each year group is available on our school website. We invite support via specific artefacts, appropriate secondary sources of information and materials.
- Parents/carers are welcomed to support pupils within the classroom environment with practical investigations.
- Class link governors may be invited into the classroom to support with science activities.
- Curriculum evenings and weeks based on specific subject areas are a regular feature of school life.
- Homework is set when appropriate. Tasks are often research based.
- Children and parents are able to access scientific information and science websites recommended by the school to support learning at home via our school website.

8. Review

This policy is reviewed in line with the school's policy review programme, every three years.

Appendix 1

Cross Curricular Links

<p>Examples of link to Numeracy</p> <ul style="list-style-type: none"> • measuring and use of equipment • recording data in tables • identifying patterns in data • using units of measure • developing graphical skills 	<p>Examples of links to Literacy</p> <ul style="list-style-type: none"> • asking questions • explaining processes • recording observations • reading non-fiction texts • vocabulary extension • developing speaking and listening skills • labelling techniques
<p>Examples of links to ICT</p> <ul style="list-style-type: none"> • software packages to present information • sensors to detect and record sound, light or temperature levels • database or spreadsheet to analyse data • branching database to develop and use keys • simulation software • Internet to research 	<p>Examples of links to PSHE</p> <ul style="list-style-type: none"> • local environment • growth and development • names of parts of the body • harmful substances • developing a healthy and safer lifestyle • topical issues
<p>Links to other National Curriculum subjects include such examples as :-</p> <ul style="list-style-type: none"> • P.E. - the human body and how it works • Music - sound aspects • Geography - global issues <ul style="list-style-type: none"> - the environment - weather • History - changes in technology, medicine etc <ul style="list-style-type: none"> - understanding of people and events of the past • R.E. - religious festivals <ul style="list-style-type: none"> - light • D.T. - enhancing problem solving skills <ul style="list-style-type: none"> - forces and friction - electricity • Art - colour and light <ul style="list-style-type: none"> - creative skills - raising questions 	

Appendix 2

MEDIUM TERM PLAN				
TOPIC: Bright Lights, Big City & Victorians Science Topic - Materials		YEAR GROUP: 2		HALF TERM: Autumn 1 and 2
Key Knowledge National Curriculum Science objectives Before beginning the units Pupils should know the difference between Living things and non-living explore and compare the differences between things that are living, dead, and things that have never been alive. This links to living things and their habitats. Pupils should be taught to: <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 usesfind out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		Key Vocabulary properties penetrate, repel, absorbent, waterproof, metal, tarmac, rubber, transparent, strong, weak, squash, bend, twist, stretch, Material wood, brick, glass, stone, paper, plastic, fabric force pushing, pulling, suitable, unsuitable		
Cultural Capital <ul style="list-style-type: none">John Mcadams – Scottish Engineer who created road surfaces.Charles Macintosh – Scottish chemist who invented waterproof fabric.				
5 Golden Bee Questions				
Be Safe and Healthy How do you remain safe while investigating materials?	Be Confident How might the inventors have felt while trying to create a new material?	Be Trustworthy and Honest How are scientists honest and trustworthy while carrying out investigations?	Be a Lifelong Learner Why is importance to pick the right properties for the job? E.G Would you make an umbrella from cotton wool?	Be Respectful Why is it important to work respectfully while working with your peers?
5 Golden Bee Outcomes				
Be Safe and Healthy To show an awareness of being safe while testing materials.	Be Confident To understand that inventors' confidence gave them the will power to continue with their work.	Be Trustworthy and Honest To know that being honest and trust worthy while carrying out an investigation leads to the correct answer.	Be a Lifelong Learner To use their properties knowledge to explain their reasons for its suitability.	Be Respectful To show an awareness of team work and understanding of their peers' feelings.

Appendix 3

Year 2 Science Curriculum

Autumn		Spring	Summer	
Bright Lights, Big City <i>Geography/ History Focus</i>	Victorians <i>History Focus</i>	Land Ahoy! <i>Geography Focus</i>	Scented Garden <i>Science Focus</i>	Animal Tales <i>Science Focus</i>
<u>Uses of Everyday Materials</u>		<u>Living things and Their Habitats</u>	<u>Plants</u>	<u>Animals, Including Humans</u>
<p>Before beginning the units Pupils should know the difference between Living things and non-living</p> <p>explore and compare the differences between things that are living, dead, and things that have never been alive. This links to living things and their habitats.</p> <p>Pupils should be taught to:</p> <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. 		<p>Pupils should be taught to:</p> <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. 	<p>Pupils should be taught to:</p> <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. 	<p>Pupils should be taught to:</p> <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.
<p>During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> asking simple questions and recognising that they can be answered in different ways observing closely, using simple equipment performing simple tests identifying and classifying using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions. 				






Appendix 4

Year 2	Previous Learning	Current learning	Future knowledge
Plants	In Year 1 Children should: <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. Identify and name the roots, trunk, branches and leaves of trees. 	<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 warmth to grow and stay healthy. 	In Year 3 Children will: <ul style="list-style-type: none"> Identify and describe the functions of different parts of the flowering plant :roots, stem/trunk/leaves and flowers Explore the part flowers play in a flowering plants life cycle, including: pollination, seed formation and seed dispersal Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants Know the way in which water is transported between plants
Animals, including Humans	In Year 1 children should: <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Know that animals, including humans, have offspring which grow into adults Know the basic stages in a life cycle for animals, including humans. 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. 	In Year 3 children will: <ul style="list-style-type: none"> Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. Know how nutrients, water and oxygen are transported within animals and humans. Know about the importance of a nutritious, balanced diet. Identify that humans and some other animals have skeletons and muscles for support, protection and movement:
Living Things and their Habitat	In Early Years children should: <ul style="list-style-type: none"> Comments and questions about the place they live or the natural world. Shows care and concern for living things and the environment. Can talk about things they have observed such as plants and animals. Notices features of objects in their environment. Comments and asks questions about their familiar world. 	<ul style="list-style-type: none"> Explore and compare the difference 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 the different sources of food. 	In Year 4 children will: <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. Know and label the features of a river Recognise that environments can change and that this can sometimes pose danger to living things.
Materials	In Year 1 children should: <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, metal, plastic, glass, 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 properties. 	<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 shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	In Year 3 children will: <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.

Year 2 - Plants

	<u>Prior Learning</u>	<u>Current Learning</u>	<u>Future learning</u>
knowledge and understanding	In Year 1 Children should: <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. Identify and name the roots, trunk, branches and leaves of trees. 	<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 warmth to grow and stay healthy. 	In Year 3 Children will: <ul style="list-style-type: none"> Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowers Explore the part flowers play in a flowering plants life cycle, including: pollination, seed formation and seed dispersal Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants Know the way in which water is transported between plants
Vocabulary	Leaves, trunk, branch, root, seed, bulb, flower, stem, wild, garden, deciduous, evergreen	Leaves, trunk, branch, root, seed, bulb, flower, stem, wild, garden, deciduous, evergreen, observe, grow, compare, record, temperature, predict, measure, diagram, germinate, warmth, sunlight.	Air, light, water, nutrients, soil, support, anchor, reproduction, pollination, dispersal, transportation, flower, energy, growth, seedling, carbon dioxide, oxygen, sugar, material, photosynthesis, chlorophyll
Key scientist	Beatrix Potter (Author & Botanist)	Agnes Arber (Botanist) Alan Titchmarsh (Botanist & Gardener)	Jan Ingenhousz (Photosynthesis) Joseph Banks (Botanist)

Teaching ideas with Scientific Enquiry focus

<u>Comparative tests</u> 	<u>Identify & Classify</u> 	<u>Observation over time</u> 	<u>Pattern Seeking</u> 	<u>Research</u> 	<u>BIG Question – Assessment Opportunity</u>
Do cress seeds grow quicker inside or outside?	How can we identify the trees that we observed on our tree hunt?	What happens to my bean after I have planted it?	Do bigger seeds grow into bigger plants?	How does a cactus survive in a desert with no water?	What should I do to grow a healthy plant?