DODFORD FIRST SCHOOL

Achieve, Believe, Create and Fly High

Subject: Science

Intent

At Dodford First School we encourage our children to develop an enquiring mind and analytical thinking skills through an interesting and relevant science curriculum.

Science continues to change our lives in many different ways and learning about scientific knowledge, methods, processes and uses provides the foundations for understanding the world in which we live , today and for the future. We study a varied curriculum which is carefully planned to build on knowledge year by year and cover the three scientific disciplines of Biology, Chemistry and Physics.

Curriculum Drivers

Achieve - *Have high aspirations, striving for success and never giving up. You can learn anything you want to!*
Believe - *Believe in yourself and value your own self-worth. To keep trying even when it is hard; learn from others and your mistakes.*
Create - *Action your thoughts and bring something into existence. Allow your creativity to flow; investigate, experiment, and invent.*
Fly High - *Have the courage to embrace new experiences and take risks. Share your knowledge with others. Enable yourself to flourish.*

Characteristics of a scientist

- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.
- Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations.
- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.
- High levels of originality, imagination or innovation in the application of skills.
- The ability to undertake practical work in a variety of contexts.
- A passion for science and its application in past, present and future technologies.

Implementation

Early Years Foundation

Key Stage One and Two

Our pupils should be able to organise their knowledge, skills and understanding around the following learning hooks:

Work scientifically

Biology:

- Understand plants
- Understand animals and humans
- Investigate living things
- Understand evolution and inheritance

Chemistry:

- Investigate materials

Physics:

- Understand movement, forces and magnets
- Understand the Earth's movement in space
- Investigate light and seeing

- Investigate sound and hearing
- Understand electrical circuits

These key concepts or as we like to explain them to children – learning hooks, underpin learning in each milestone. This enables pupils to reinforce and build upon prior learning, make connections and develop subject specific language.

The vertical accumulation of knowledge and skills from Years 1 to 4 is mapped as follows:

Threshold concept	Milestone 1 (Year 1 and 2)	Milestone 2 (Year 3 and 4)
Work scientifically	• Ask simple questions. • Observe closely, using simple equipment. • Use observations and ideas to suggest answers to questions. • Identify and classify, suggesting ideas for groups. • Perform simple comparative tests.	Ask relevant questions. • Set up simple, practical enquiries and comparative and fair tests. • Make accurate measurements using standard units, using a range of equipment, e.g.

	• Be able to suggest what to change and keep the same for a fair test. • Gather and record simple data to help in answering questions. • To be able to identify and verbalize skills used when completing Science Passports at the end of each topic.	thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests. • Identify differences, similarities or changes related to simple,

		scientific ideas and processes. • Use straightforward, scientific evidence to answer questions or to support their findings.
Biology : understanding plants	Identify and name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen. • Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers. • Observe and describe how seeds and bulbs grow into mature plants.	Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers. • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. • Investigate the way in which water is transported within plants. • Explore the role of flowers in the life cycle of flowering plants,

	• Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	including pollination, seed formation and seed dispersal.
Biology: Understand animals and humans	Identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates. • 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 (birds, fish, amphibians, reptiles, mammals and invertebrates, including pets). • Identify name, draw and label the basic parts of the human body and say which	Identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat. • Construct and interpret a variety of food chains, identifying producers, predators and prey. • Identify that humans and some animals have skeletons and muscles for support, protection and movement.

	part of the body is associated with each sense. • Notice that animals, including humans, have offspring which grow into adults. • Investigate 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.	• 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.
Biology: Investigate living things	Explore and compare the differences between things that are living, that are dead and that have never been alive.	Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys.

	• 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.	• Recognise that environments can change and that this can sometimes pose dangers to specific habitats.
Biology: Understand evolution and inheritance	*Identify how humans resemble their parents in many features.*	*Identify how plants and animals, including humans, resemble their parents in many features.*

		• *Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.* • *Identify how animals and plants are suited to and adapt to their environment in different ways.*
Chemistry: Investigate 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	**Rocks and Soils** • Compare and group together different kinds of rocks on the basis of their simple, physical properties. • Relate the simple physical properties of some rocks to their formation (igneous or sedimentary).

	a variety of everyday materials. • Compare and group together a variety of everyday materials on the basis of their simple physical properties. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard for particular uses.	• Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. • Recognise that soils are made from rocks and organic matter. **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 the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics. • Identify the part played by evaporation and condensation in the

		water cycle and associate the rate of evaporation with temperature.
Physics: Understand movement, forces and magnets	*Notice and describe how things move, using simple comparisons such as faster and slower.* • *Compare how different things move.*	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.
Physics: Understand light and seeing	*Observe and name a variety of sources of light, including electric lights, flames and the Sun, explaining that we see things because light travels from them to our eyes.*	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.
Physics: Investigate sound and hearing	*Observe and name a variety of sources of sound, noticing that we hear with our ears.*	Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear
Physics: Understand electrical circuits	*Identify common appliances that run on electricity.* • *Construct a simple series electrical circuit.*	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.

Physics: Understand the Earth's movement in space	*Observe the apparent movement of the Sun during the day.* • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.	*Describe the movement of the Earth relative to the Sun in the solar system.* • *Describe the movement of the Moon relative to the Earth.*

Impact

Assessment

Through the explicit teaching of Science skills, both the teachers and the pupils assess their learning continuously throughout the lesson. At the end of the unit, pupils use their Learning Passports to reflect on their knowledge and understanding. Our assessment systems enable teachers to make informed judgements about the depth of their learning and the progress they have made over time.

Pupil Voice

Impact

Assessment

Through the explicit teaching of the Writing skills, both the teachers and the pupils assess their learning continuously throughout the lesson. Our assessment systems enable teachers to make informed judgements about the depth of their learning and the progress they have made over time.

Pupil Voice

What xxx looks like at Dodford First School

Photographs

Disclaimer: This has been developed with reflection upon the National Curriculum (2014) and Chris Quigley's Essential Curriculum.