



South Gosforth First School Science – Year 2 Long Term Plan

Purpose of Study

At South Gosforth First School, we aim to give all of our pupils a strong understanding of the world around them. Pupils are able to discover 'how the world works' and our place, impact, roles and responsibilities within this world. Our pupils are encouraged to ask questions, think deeply and apply their growing scientific knowledge to investigate and learn more about the different branches of Science: Biology, Chemistry and Physics. Our skilled staff teach our children to develop a systematic and logical way of working and provide opportunities for them to reflect on investigations and apply their growing knowledge in a range of different contexts.

As part of the planning process for Science at SGFS, teaching staff give careful consideration to the delivery of 'substantive knowledge' (what we learn) running alongside 'procedural knowledge' (how we learn). The sequence of learning dictates what should be taught, when it should be taught and how it should be taught, anticipating common misconceptions and providing a rich background of detailed subject knowledge for teachers in order that all children can reach beyond core concepts. Understanding of each key block of substantive knowledge is revisited across the years to ensure genuine progression, while the curriculum details the specialist vocabulary children should be able to use to articulate their understanding accurately and precisely at each stage. Working in this way in the classroom is described as 'Working as a Scientist' to pupils – This includes the following key skills: Observing Over Time; Pattern Seeking; Identifying, Grouping and Classifying; Carrying out Research Using a Range of Sources; Comparative Testing and Fair Testing. Practical tasks are carefully considered to ensure that they promote the children's best work; are relevant to the unit studied; and make the learning journey assured.

Aims

In line with the National Curriculum for Science it is our aim 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
- use the 6 areas of working scientifically to develop enquiry skills; observing over time, pattern seeking, secondary research, identifying grouping and classifying, comparative tests and fair tests.
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.



Autumn 1 and 2	• Living Things and their Habitats • Learn about a Scientist		
Character Culture Creativity Challenge	Prior Learning Year 1 objectives: • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Plants) • Identify and describe the basic structure of a variety of common flowering plants, including tress. (Plants) • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Animals including humans) • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Animals including humans) • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Animals including humans) • Observe changes across the four seasons. (Seasonal changes)		
	Key Learning Intentions – Subject Knowledge • 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.	Key Learning Intentions – Working Scientifically To ask simple questions and recognise that it can be answered in different ways. To observe closely using simple equipment. To perform simple tests. To identify and classify. To use observations and ideas to suggest answers to questions. To gather and record data to help in answering questions.	
	Overview of scientific knowledge All objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers (This is a simplification but appropriate for Year 2 children) An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made from fossil fuels) Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants – shelter, food and water.		Key Vocabulary • Living • Dead • Never been alive • Microhabitat • Food chain • Woodland • Arctic • Rainforest



	Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. These conditions affect which plants and animals live there. The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain their food from plants and other animals in a food chain.	
	Overview of working scientifically Observing Over Time: What conditions do minibeasts prefer to live in? Pattern Seeking: Research: How does the habitat of the Arctic compare to the habitat of the rainforest? Identifying & Classifying: How would you group things to show which are living, dead or have never been alive? Comparative Test: Is there the same level of light in the evergreen wood compared with the deciduous wood? Fair Test: N/A	
	Milestones of learning	
	• Observe and list the key features of things that are living, dead and that have never been alive. • Organise things of your choice into groups: living, dead and never been alive.	
	• Observe animals / plants in their natural habitats. • Match the animal / plant to its habitat.	
	• Describe why the animal / plant is suited to its environment.	
	• Draw a food chain that ends with a sparrow hawk. • Explain the differences in a food chain from a herbivore and a carnivore.	
	• Learn about a Scientist. (Darwin)	
	Assessment Draw and label a diagram of a simple food chain for each item of a human meal.	
	Enhancements • Investigate the conditions minibeasts prefer to live in. • Investigate the light in an evergreen wood compared with a deciduous wood (school trip) • Build a bug hotel in the school grounds. • Research world habitats and create own non-fiction book using 'Book Creator' to present findings. • Parent Workshop – make a shoebox habitat.	



Spring 1	Animals Including Humans	
Character Culture Creativity Challenge	Prior Learning Year 1 objectives: - Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Animals including humans) - Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Animals, including humans)	
	Key Learning Intentions – Subject Knowledge - 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.	Key Learning Intentions – Working Scientifically To ask simple questions and recognise that it can be answered in different ways. To observe closely using simple equipment. To perform simple tests. To identify and classify. To use observations and ideas to suggest answers to questions. To gather and record data to help in answering questions.
	Overview of scientific knowledge Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles. All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise. Good hygiene is also important in preventing infections and illnesses.	Key Vocabulary - offspring - reproduction - exercise - active - hygiene - germs - food types
	Overview of working scientifically <u>Observing Over Time:</u> How does a tadpole change over time? <u>Pattern Seeking:</u> Which age group of children wash their hands the most in a day? <u>Research:</u> N/A <u>Identifying & Classifying:</u> Which offspring belongs to which animal? <u>Comparative Test:</u> Do bananas make us run faster? <u>Fair Test:</u> N/A	



	Milestones of learning
	• Name the offspring of animals and humans.
	• List the basic needs of animals, including humans, for survival.
	• Describe a healthy diet.
	• Describe a healthy lifestyle.
	• Observe and describe the effect of exercise.
	Assessment Match pictures and their offspring (including those where offspring is dissimilar e.g. Frog and butterfly)
	Enhancements • Observe tadpoles as they grow. • Investigate if certain foods increase our running pace. • Make healthy food.



Spring 2	Uses of Everyday Materials	
Character Culture Creativity Challenge	Prior Learning Year 1 objectives: - Distinguish between an object and the material from which it is made. (Everyday materials) - Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. (Everyday materials) - Describe the simple physical properties of a variety of everyday materials. (Everyday materials) - Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Everyday materials)	
	Key Learning Intentions – Subject Knowledge - 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.	Key Learning Intentions – Working Scientifically To ask simple questions and recognise that it can be answered in different ways. To observe closely using simple equipment. To perform simple tests. To identify and classify. To use observations and ideas to suggest answers to questions. To gather and record data to help in answering questions.
	Overview of scientific knowledge All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example: a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials. Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness.	
	Overview of working scientifically <u>Observing Over Time:</u> Would a paper boat float forever? <u>Pattern Seeking:</u> N/A <u>Research:</u> What properties make plastics a problem for the environment? <u>Identifying & Classifying:</u> Which material is the stretchiest? <u>Comparative Test:</u> Which paper would be the strongest for a paper bridge? <u>Fair Test:</u> N/A	
		Key Vocabulary - Names of materials - Properties of materials – opaque, transparent, translucent, reflective, flexible, rigid, waterproof, absorbent - Twisting, squashing, bending, stretching



	Milestones of learning
	List different uses for everyday materials.
	Compare and contrast the properties of materials and use this to explain why certain materials are used for particular purposes.
	Observe and describe changes to the shape of solid objects when they are squashed, bent, twisted or stretched?
	Experiment with changing the shape of objects. Which paper would be the strongest for a paper bridge?
	Paper is unsuitable for a model boat. Do you agree or disagree? (reason, justify)
	Assessment Sort materials into groups of suitability for a specific purpose i.e. Materials that could be used for a new playground and what objects they could be used for.
	Enhancements - Investigate which material is the stretchiest? - Investigate which paper would be the strongest to make a paper bridge? - Present your findings of the paper bridge investigation to the class. - Make a paper boat and explore how paper changes when left in water.



Summer 1 and 2	Plants - Learn about a Botanist	
Character Culture Creativity Challenge	Prior Learning Year 1 objectives: - Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Plants) - Identify and describe the basic structure of a variety of common flowering plants, including trees. (Plants)	
	Key Learning Intentions – Subject Knowledge - 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.	Key Learning Intentions – Working Scientifically To ask simple questions and recognise that it can be answered in different ways. To observe closely using simple equipment. To perform simple tests. To identify and classify. To use observations and ideas to suggest answers to questions. To gather and record data to help in answering questions.
	Overview of scientific knowledge Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of the year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.	
	Overview of working scientifically <u>Observing Over Time:</u> What happens to my sunflower seed after I planted it? <u>Pattern Seeking:</u> Do bigger seeds grow into bigger plants? <u>Research:</u> What does a botanist do? <u>Identifying & Classifying:</u> N/A <u>Comparative Test:</u> Do cress seeds grow quicker inside or outside? <u>Fair Test:</u> N/A	
	Key Vocabulary - Names of garden and wild flowering plants in the local area. - Germinate - Require - Dormant - Parts of a plant.	
	Milestones of learning - Observe the growth of seeds and bulbs. - What are the similarities and differences in the growth of seeds and bulbs?	



	• What do plants need to stay healthy?
	• How could you try to revive these plants? (apply) Give pupils a dried out plant, one that's been in the fridge, one that's been kept in the dark etc.
	• Learn about a botanist. What might a scientist need to keep in mind when recording information about the growth of seeds and bulbs?
	Assessment Explanation – How do plants grow?
	Enhancements • Investigate if bigger seeds grow into bigger plants. • Plant beans in bags of water and watch the grow. • Grow cress – think about the conditions for healthy plant growth. Do they grow quicker inside or outside? Record their growth.