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| **At Cotton End Forest School, Science is planned to include Forest School and Learning Outside the Classroom opportunities. Through this, all learners have regular opportunities to achieve and develop confidence and self-esteem through hands on learning experiences. Our approach to the National Curriculum provides a stimulus for all learning preferences and dispositions. Learning can take place in Shocott Spring or within the school grounds, as well as through external visits and visitors.** | | | | | | |
|  | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| **Plants** | -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 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. | -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 |  |  |  |
| **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  - 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  -describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) | -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 | -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 | -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 | -Describe the changes as humans develop to old age | -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 |
| **Living things & habitats** |  | - 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 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 microhabitats.  -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 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 | -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 | -Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals  -Give reasons for classifying plants and animals based on specific characteristics |
| **Evolution & inheritance** |  |  |  |  |  | -Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions 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 that adaptation may lead to evolution |
| **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  -recognise that soils are made from rocks and organic matter |  |  |  |
| **Everyday 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 a variety of everyday materials  -compare and group together a variety of everyday materials on the basis of their simple physical properties  -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 | -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  - 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 |  |  |  |  |
| **Properties & changes of materials** |  |  |  |  | -Compare and group together everyday materials on the basis of their properties, including their hardness, transparency, and conductivity (electrical and thermal)  -Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic  -Compare and group together everyday materials on the basis of their properties, including their solubility 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  -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 |  |
| **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 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 |  |  |
| **Light** |  |  | -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 an opaque object |  |  | -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 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 |
| **Sound** |  |  |  | -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 |  |  |
| **Forces & 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 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 |  | -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 |  |
| **Seasonal changes** | -observe changes across the four seasons.  -observe and describe weather associated with the seasons and how day length varies. |  |  |  |  |  |
| **Earth & Space** |  |  |  |  | -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 |  |
| **Electricity** |  |  |  | -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 buzzer  -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 |  | -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 |

**Intent**

At Cotton End Forest School, the intent of our Science curriculum is to provide children with a broad and balanced curriculum which encourages the learning of scientific concepts through child-led exploration and investigation. Through our sequence of lessons, children are given opportunities to investigate scientific theories through practical activities and discussion to inspire them to generate and investigate their own questions and curiosities. This leads to child-led investigations which develops a progression of knowledge through the progression of inquiry skills.

*Inquiry Skills Curriculum*

Throughout each year group, the intent of our curriculum is to develop the skills needed to conduct fair and effective investigations. This is through developing skills such as: using scientific evidence; taking measurements; fair testing; identifying and classifying information; using, recording, reporting and presenting data. From Early years, children are encouraged to explore and begin to make sense of the world around them through to KS1 where children ask simple questions, observe carefully and perform simple tests. By KS2, children are encouraged to ask varied questions, use scientific evidence to plan experiments and a range of scientific equipment to conduct experiments efficiently.

*Knowledge Curriculum*

Enhanced by Forest School, the intent of the knowledge curriculum is to develop an understanding of the natural world including; animals, humans, plants and materials which is begun in Early Years, developed throughout KS1 and developed to a deeper understanding in KS2. This understanding is further enhanced through topics such as forces, electricity and space and evolution.

Fair Testing

Identifying and classifying

Using test results

Recording data

Reporting and presenting

**Implementation**

For children to develop their scientific knowledge through Inquiry, the structure of lesson sequence begins with a pre-assessment, builds on previous knowledge and gives many opportunities for revision. Lessons then provide stimuli and a foundational understanding of the topic to inspire children, develop their curiosities and begin to ask questions which challenge their own and other’s thinking. These questions are then developed through whole class, individual or small group investigations. Through investigation, children develop inquiry skills alongside the development of knowledge and begin to hypothesise and prove or disprove scientific theories.

We suggest a structure of lesson sequence which is used to support planning, however teachers are given the autonomy to develop the curiosities of children alongside the skills and knowledge as outlined in the Science curriculum overviews. Teachers use a combination of different resources appropriate for each individual class and resources are collated in the Science lab – these are updated and developed upon teacher request. Science units are arranged according to child interest, progression of knowledge and skills and the use of the outdoors to enhance first-hand experience. Science displays are encouraged in each classroom to support children’s understanding of key vocabulary and scientific theories. Science days and weeks are encouraged throughout the year to give children the opportunity to develop investigations over a period of time and consolidate their learning. Children are assessed in difference ways at the end of the unit to assess their knowledge, alongside their inquiry skills.

**Impact**

The impact of lesson sequences, using different resources and developing knowledge through inquiry will encourage children to investigate their thinking in Early Years/KS1, and question their thinking and scientific theories in KS2. Science days and weeks will inspire children and give them time to explore their thinking further. We aim for teachers to feel supported and confident in teaching science and have a bank of resources to pull on in order to plan effective units of study. The impact of our Science curriculum is to develop knowledge through inquiry and use the outdoors to enhance investigation. The impact of scientific units will measure the understanding of scientific knowledge through the progress made between a pre and post-assessment. Progress of investigative skills will be measured through a ‘Science Investigation Record’ to assess children’s investigative skills.