 Vine Tree Primary Long-Term Plan for Science 

At Vine Tree Primary School, we aim to provide learning opportunities in Science which encourage children to:

* ask relevant questions and use these to plan scientific enquiries, recognising and controlling variables where necessary;
* set up practical enquiries safely, using appropriate techniques, apparatus and materials during both fieldwork and class work;
* gather, record, classify and present data in a variety of ways, using a range of scientific equipment of increasing complexity;
* become ‘scientific thinkers’ by developing attitudes of curiosity, co-operation, perseverance, responsibility and independence;
* use the data gathered to make sense of evidence, test out hypothesis, find patterns in observations and evaluate processes and outcomes;
* use systematic and logical reasoning, solve problems and communicate their findings;
* develop understanding on how their actions effect the environment around them;
* develop the skills to work in a variety of ways including, working together in groups, independently, in partners and as a whole class;
* have an enjoyable experience of science so that they will develop a deep and lasting interest and become inspired to follow this path further.

Learning Challenges are introduced in sessions, encouraging children to take an active role in their learning, but also to help learning becoming sticky!

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|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Year 1 | **Plants and Animals Where We Live**  In this topic, children explore their local environment (school grounds or local park) to find out about the plants and animals that live in their locality. Many of the activities could also be carried out in a local botanic garden or arboretum, which has a section on local plants. Children will learn to name and identify common wild and garden plants, including trees, so they are familiar with common names and able to use these in Year 2 and beyond. | **Who am I?**  In this topic, children will learn about the basic parts  of the human body and explore their five senses using a wide range of activities, which can be spread over a half term. | **Celebrations**  This topic uses the theme of celebrations to explore a number of curriculum areas, including everyday materials, plants and light. There are a number of activities to choose from, all offering opportunities for cross-curricular work. | **Polar Places**  In this topic, children plan an expedition to the polar regions, learning about properties of different  materials, and a range of living things in the polar  regions. | **On Safari**  Children go on safari to explore invertebrates and  other plants and animals in the local area. It would be more appropriate carried out in the spring or summer months when there is a greater abundance of invertebrates for children to observe. | **Holiday**  In this topic, children will plan what they need to pack for a holiday, and explore the different animals they might encounter at the seaside and the human impact on the environment. You could begin by voting on where in the UK or the world children would like to visit on holiday and work with the most popular  place, researching where it is, climate, food, etc. with  children deciding what they would need to take |
| Year 2 | **Our Local Environment**  This topic brings together study of living things, habitats and growing plants and is strongly focused on outdoor learning and investigations. | **Materials Monster**  This topic explores the properties and uses of everyday materials, set in the context of meeting, talking to and feeding the Materials Monster. | **Healthy Me**  In this topic, children explore the importance of exercise, diet and good hygiene, building on the Who am I? topic in Year 1. | **Little Masterchefs**  This topic explores food, including making healthy food choices, and cooking various different foods | **Young Gardeners**  This topic brings together study of living things and habitats and is strongly focused on outdoor learning  and investigations. | **Squash, Bend, Twist and Stretch**  In this unit, children explore how the shapes of objects can be changed by squashing, bending, twisting and stretching. In doing this they raise questions, perform simple tests, and gather and record data. |
| Year 3 | **Food and our Bodies**  Children work scientifically on a variety of quick challenges and longer tasks to learn about food and their bodies. This topic looks at where animals get food from and why it is important, and skeletons, muscles and joints. | **How Does Your Garden Grow?**  Children work scientifically on a variety of quick challenges and longer tasks to learn about plants. They learn about the different parts of plants, what plants need to live, water transportation in plants and pollination. | **Forces and Magnets**  This topic looks at magnets and their uses, and what makes magnetic poles special, along with the idea that some forces such as magnetic force can act without contact – unlike pushes and pulls, which require direct contact | **Light and Shadows**  Children work scientifically on a variety of quick challenges and longer tasks to learn about the wonders of light, including reflections and shadows. | **Rocks, Soils and Fossils**  In this topic children work scientifically on a variety of quick investigations and longer tasks to learn about rocks. This topic covers the properties and uses of rocks, the rock family, soils and finally fossils. | **The Nappy Challenge**  This topic looks at disposable nappies and provides opportunities for children to ask their own questions and make decisions on how to answer their questions using different scientific enquiry activities. |
| Year 4 | **Living Things**  This topic teaches the children to recognise that living things can be grouped in a variety of ways. They explore and use keys to identify and name a variety  of living things. Finally, they look at how changes to habitats can pose dangers to living things. Whilst most of the work for this topic can be carried out in spring and summer, it is important that children visit the local environment throughout the school year so that they continue to develop their understanding of seasonal changes and how these impact on living things. | **Looking at States**  Children will learn about states of matter. They will compare and group materials together, according to whether they are solids, liquids or gases. They will observe that some materials change state when heated or cooled, and they will identify the part played by evaporation and condensation in the water cycle. | **The Big Build**  In this topic, children learn about building towers and  bridges, starting with constructing tall towers, then exploring bridges, next they look at animals as builders and finally engage in researching famous engineers and architects and the structures they built. Children will already know many things about the materials they will encounter, how different materials stretch and their uses. They will use and develop working scientifically skills and understanding though comparative and fair tests, measuring, repeat readings and drawing and reading bar and line graphs. | **Teeth and Eating**  Children learn about digestion and different types of teeth, before moving on to explore deadly predators and their prey, in their exploration of food chains. They work scientifically throughout the topic, using enquiry, practical experiments and hands-on research to answer questions and investigate how we eat, why we eat and what we eat. | **What's that Sound?**  Children will already know many things about sound, even without any formal teaching of it. They will encounter how sounds are made on a variety of instruments and how they can be changed in volume, pitch and over distance. They will explore making sounds on a range of objects that aren’t instruments, in order to investigate how sounds are created to make music. | **Power it Up**  Children revisit some uses of electricity and the importance of safety before constructing simple circuits. Understanding how to change a circuit by changing its components makes up the third part of this topic, leading in a final application of knowledge and skills when the children design and make an alarm using their knowledge of circuits. |
| Year 5 | **Material World**  In this topic, the children learn about materials and how they change. First, they test properties of materials before looking at how materials dissolve, what a solution is and evaporation. Finally, children compare reversible and irreversible changes. | **Amazing Changes**  In this topic, the children learn about materials, how  they change and which changes are reversible and irreversible. The topic concludes by looking at how these properties are applied in the real world. | **Out of this World**  In this topic, children learn about space. Starting with the Solar System, they look next at how ideas about space have changed over time before they explore what causes us to experience night and day on Earth. | **Let's Get Moving**  In this topic children learn about forces and machines. They start with the force of gravity then study friction forces, including air and water resistance, before  investigating how simple machines work. | **Growing Up and Growing Old**  In this topic, children look at and describe the changes as humans develop to old age. Pupils draw a timeline to indicate stages in the growth and development of humans and learn about the changes experienced in puberty | **Circle of Life**  In this topic children look at the life cycles of various species including mammals, amphibians, fish and birds. They also look at and describe the life process of reproduction in plants and animals. |
| Year 6 | **Classifying Living Things**  Children build on their learning about grouping  living things in Year 4 by looking at the classification system in more detail. The topic is divided into two units, Children first revisit their knowledge of classification and creating keys, before developing their knowledge by looking at fungi and bacteria. Children also look at the work of Carl Linnaeus, the scientist who first made important the function of naming and classifying to ‘identify’ organisms. | **Light**  The topic introduces the concept of light travelling in straight lines. It starts by looking at beams of light and how light travels to enable children to understand how we see things. This understanding is then applied to the production of shadows and starts to look at how light is reflected. The topic then takes the learning into the realm of coloured light and rainbows, using scientific skills to raise and answer questions. It builds on the work carried out in Year 3 on light, shadows and reflection. | **Electricity**  This topic builds on the Year 4 work on electricity, taking it into the scientific use of symbols for components in a circuit, as well as considering the effect in more detail of changing components in a circuit. The children have the opportunity to apply their learning by creating an electronic game. | **Healthy Bodies**  In this topic children build on learning from Years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system). It considers life processes that are internal to the body, such as the circulatory system. The impact of lifestyle on bodies, particularly of humans, is also considered. Scientists are continually finding out what is good and bad for us, and their ideas do change as more research is carried out. | **Evolution and Inheritance**  Building on what they learned about fossils in Year 3, children find out more about how living things have changed over time. They are introduced to the idea that characteristics are passed from parent to their offspring, but that they are not exactly the same. They should also appreciate that variation over time can make animals more or less likely to survive in particular environments (adaptation). Children look at evolution and Charles’ Darwin’s theory of natural selection, as well as palaeontologist Mary Anning’s work with fossils. | **The Titanic**  Children engage in a different approach to their science in this topic. They use their science and link it to an historical event in context; the sinking of the Titanic. This topic is based around applying the working scientifically skills that they have learned so far in their science lessons, to explore some of the scientific concepts behind the Titanic, e.g. floating and sinking. It can be used as a good opportunity to embed, assess and observe working scientifically skills, as well as laying foundations for transition to KS3 science. |