Working Scientifically Journey at Heath Hayes Academy

EYFS

Explore the natural world around them, making observations and drawing pictures of animals and plants.

KS1

Asking simple questions and recognising that they can be answered in different ways.

Observing closely, using simple equipment.

Performing simple tests.

KS1

Identifying and classifying.

Using their observations and ideas to suggest answers to questions.

Gathering and recording data to help in answering questions.

LKS2

Asking relevant questions and using different types of scientific enquiries to answer them.

Setting up simple practical enquiries, comparative and fair tests.

Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.

Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.

LKS2

Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.

Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

Identifying differences, similarities or changes related to simple scientific ideas and processes.

Using straightforward scientific evidence to answer questions or to support their findings.

UKS2

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.

Taking measurements, using a range of scientific equipment, with increasing accuracy and precision.

Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs.

UKS2

Using test results to make predictions to set up further comparative and fair tests.

Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations.

Identifying scientific evidence that has been used to support or refute ideas or arguments.

FINISH

Year 1 Science

Year 1

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

describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)

identify and name a variety of common animals that are carnivores, herbivores and omnivores

identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals

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

Pupils to know the value of trees and plants.

Everyday materials

compare and group together a variety of everyday materials on the basis of their simple physical properties

describe the simple physical properties of a variety of everyday materials

identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock

distinguish between an object and the material from which it is made

Seasonal Changes

observe changes across the 4 seasons

observe and describe weather associated with the seasons and how day length varies

Pupils begin to understand the world is heating up. To understand why we predict the weather. To identify ways to protect themselves from flooding. To know the difference between weather and climate and that the climate is changing because of human activity.

Year 2

Year 2 Science

Year 2

Animals, including humans

- 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.

Plants

- 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.

Living things and their 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 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.
- Pupils to know why we need to protect habitats and create more. Pupils to know how to improve a habitat for minibeasts.

Uses of everyday materials

- identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses
- compare how things move on different surfaces
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
- Pupils to know a range of sustainable materials. Pupils to know the environmental impact of different materials.

Year 3

Year 3

Year 3 Science

Plants

- Pupils to understand the role of plants in the Carbon cycle. To understand the seed dispersal methods of native trees. To know that carbon is found in plants (and all living things).
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal
- investigate the way in which water is transported within plants
- 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
- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers

Animals including humans

- 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
- To understand the relationship between animals and plants.

Light

- find patterns in the way that the size of shadows change
- recognise that shadows are formed when the light from a light source is blocked by a solid object
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- notice that light is reflected from surfaces
- recognise that they need light in order to see things and that dark is the absence of light

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

Forces & Magnets

- predict whether 2 magnets will attract or repel each other, depending on which poles are facing
- describe magnets as having 2 poles
- 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
- observe how magnets attract or repel each other and attract some materials and not others
- notice that some forces need contact between 2 objects, but magnetic forces can act at a distance
- compare how things move on different surfaces

Year 4

Year 4 Science

Year 4

All Living Things

- 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
- Pupil to make positive changes to the local environment.

Animals including humans

- 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
- Pupils know that the impact of lifestyles on climate change can be measured.

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

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
- Pupils to know where electricity comes from and some types of renewable energy. To know some types of green technology such as electric cars and energy efficient appliances, and how they can be used in homes and businesses to reduce energy consumption.

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 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

Year 5

Year 5 Science

Year 5

Living things and their habitats

- 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

Animals including humans

- describe the changes as humans develop to old age
- Pupils understand that varying lifestyles produce varying carbon emissions.

Earth and 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
- Pupils can describe how carbon levels have changed over time including during prehistoric periods, the preindustrial era, the industrial revolution and the modern era.

Forces

- 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 soils are made from rocks and organic matter
- Pupils identify and explain the link between burning fossil fuels and climate change.

Properties and Change of Materials

- compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), 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
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- 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 on bicarbonate of soda

Year 6

Year 6

Year 6 Science

Living Things and their habitats

- give reasons for classifying plants and animals based on specific characteristics
- 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

Animals including humans

- 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

Light

- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
- 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 that objects are seen because they give out or reflect light into the eye
- recognise that light appears to travel in straight lines

Electricity

- 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
- Pupils know some renewable energy sources (and their importance) such as solar, wind, and hydro power and how they can reduce greenhouse gas emissions. Pupils have a basic understanding of the scientific processes involved when fossil fuels are burnt (including the impact on the climate).

Evolution

- Pupils understand that 2030 is not an end-of-the-world deadline, but a target to reduce emissions to manage future impacts of climate change. Pupils can name a range of different climate action strategies: reducing consumption, using renewable energy and protecting or restoring carbon sinks.
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago

Finish