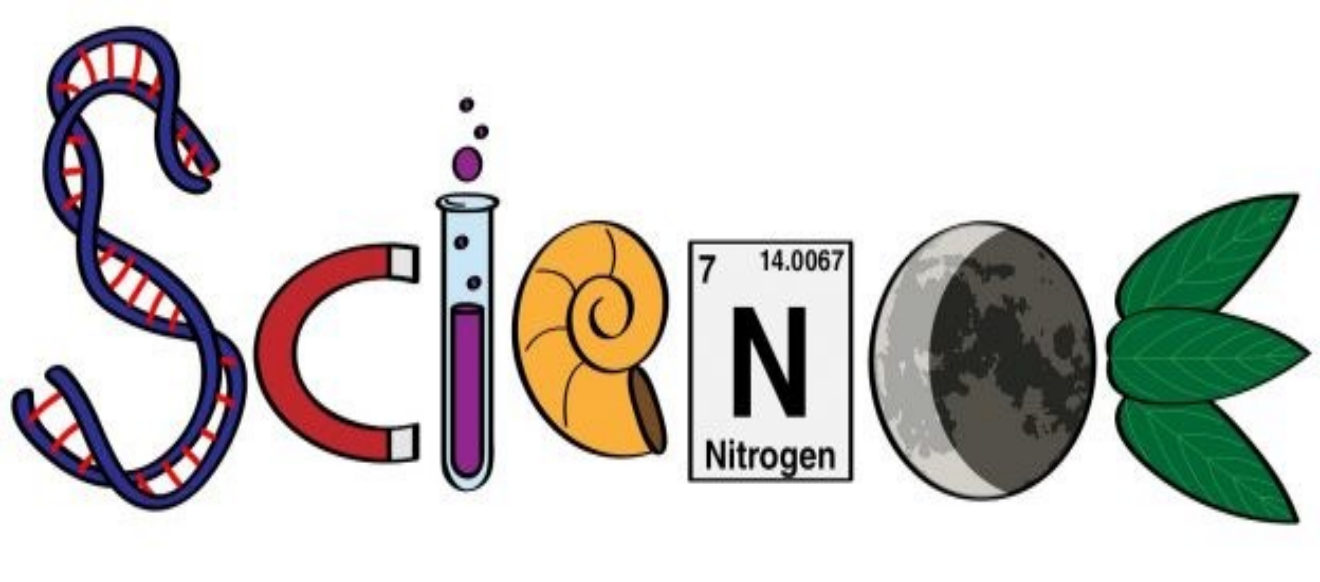
Our Curriculum



Newton Hill Community School

Ready For Learning - Ready For Life

Rationale & Intent

At Newton Hill Community School we are guided by the National Curriculum for Science (2014). The National Curriculum for science aims 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.
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

At Newton Hill, science is taught discretely with a focus of both knowledge and enquiry skills to ensure full coverage of the curriculum, which is both progressional and engaging to pupils. Our science curriculum has been designed with the belief that science provides the foundations for the understanding of the world.

Planning of learning combines knowledge and a working scientifically skill, of which the delivery includes a range of up to date resources and activities which allow the children to develop as independent learners. Children are exposed to high quality scientific vocabulary, which is linked through all areas of the curriculum and includes the vocabulary required to understand the working scientifically skills. Teachers are encouraged to develop their own subject knowledge surrounding each topic to ensure high quality delivery of learning.

Intent, Implementation & Impact

We believe that the best science teaching fosters and develops pupils' curiosity in the subject whilst also helping them fulfil their potential.

For our pupils to achieve well in science, they need to acquire the necessary scientific knowledge and also be able to enjoy the experience of taking part in purposeful scientific enquiries. For children, science is the exploration of the world around them through investigation. Science has a heavy emphasis on investigation involving prediction, observation, testing and evaluation. Children learn by playing with things in their world. They pick up clues about what they see, touch, smell, taste and hear in order to makes sense of it all. Eventually they come to conclusions which they match up with all the experiences they have had.

We believe that it is good practice for children to be encouraged to actively learn, by developing their own investigations based on ideas given by the teacher, and their own ideas. These ideas will be increasingly founded in scientific knowledge and understanding.

Intent, Implementation & Impact

At Newton Hill Community School, teachers plan and deliver high-quality and engaging science lessons incorporating a range of teaching and learning styles. At Newton Hill Community School, teachers will provide opportunities for pupils to:

- Learn about science, where possible, through first-hand practical experiences;
- Develop their research skills through the appropriate use of secondary sources;
- Work collaboratively in pairs, groups and/or individually;
- Plan and carry out investigations with an increasing systematic approach as they progress through school;
- Use equipment safely and sensibly;
- Develop their questioning, predicting, observing, measuring and interpreting skills;
- Record their work in a variety of ways e.g writing, diagrams, graphs, tables;
- Read and spell scientific vocabulary appropriate for their age;
- Be motivated and inspired by engaging and interactive science displays which include key vocabulary and relevant questions;
- Learn about science using the outdoor learning environment;

Year 1 Journey

Year 1 Cycle

Animals Including Humans

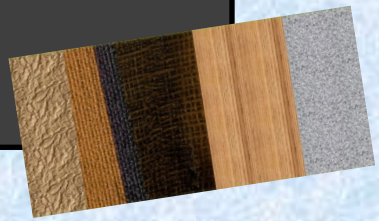
To name a variety of animals and parts of the human body.

Seasons

Changes across the four seasons and the day length.

Everyday Materials

Identify and name a variety of materials.



Plants

Identify and name a variety of wild and garden plants.

Year 2 Journey

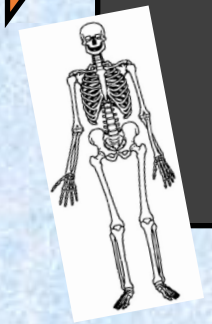
Year 2 Cycle

Living Things and Their Habitats

To explore the differences between things that are living, dead and have never been alive. To learn about different habitats, name plants and animals and create food chains.

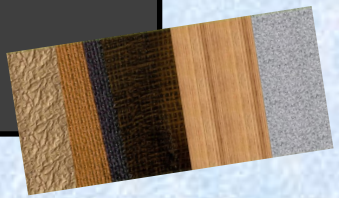
Animals Including Humans

To notice that animals have offspring which grow into adults and to describe the basic needs of animals.



Uses of Everyday Materials

To compare the suitability of different everyday materials and that shapes of solid objects made from some materials can be changed.



Plants

To observe and describe how seeds and bulbs grow into plants and what they need to stay healthy.

Year 3 Journey

Year 3 Cycle

Light

To know that we need light to see things, how to protect our eyes from the sun and how shadows are formed and that they can change.

Forces and Magnets

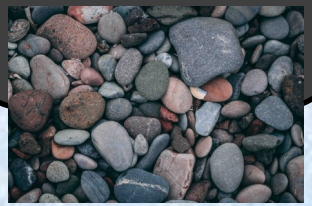
To compare how thing move on different surfaces, observe how magnets attract and repel each other and to compare and everyday materials depending on whether they are attracted to a magnet.

Animals Including Humans

To identify that humans have skeletons and muscles.

Rocks

Compare and group rocks together, describe how fossils are formed and understand what soils are made from.



Plants

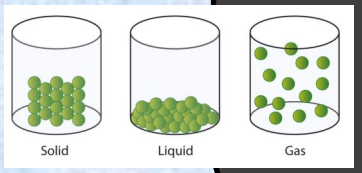
Name and describe the functions of different parts of plants and plants requirements for life and growth.

Year 4 Journey

Year 4 Cycle

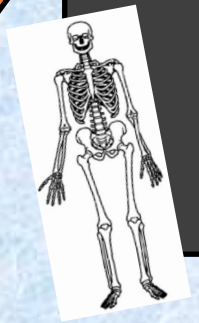
States of Matter

To compare and group materials together, observe that materials can change state when heated or cooled and understand the water cycle.



Animals Including Humans

To learn about food chains, the digestive system and teeth.

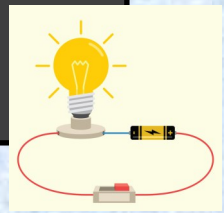


Sound

To identify how sounds are made, how vibrations travel and find patterns between pitch and volume of different sounds.

Electricity

To construct simple circuits and name basic parts, identify how to make a lamp work, to understand the role of a switch and to learn about conductors and insulators.



Living Things and Their Habitats

To use classification keys and recognise that environments can change.

Year 5 Journey

Year 5 Cycle

Earth and Space

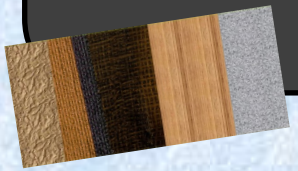
To describe the movement of the Earth, other planets and the Moon, the shape of the Sun, Earth and Moon and to explain day and night.

Forces

Identify the effects of air resistance, water resistance and friction, to explain that unsupported items will fall towards the Earth because of gravity and to learn about different mechanisms.

Properties and Changes of Materials

To group materials together based on their properties, understand how to separate mixtures and understand reversible and irreversible changes.

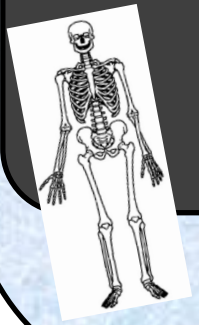


Living Things and Their Habitats

Describe the differences in life cycles of mammas, amphibians, insects and birds and reproduction in some plants and animals.

Animals Including Humans

To describe the changes as humans develop from birth to old age.



Year 6 Journey

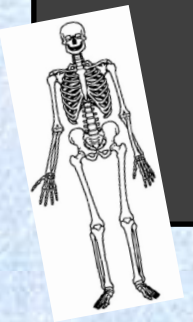
Year 6 Cycle

Living Things and Their Habitats

To classify living things based on specific characteristics.

Animals Including Humans

To describe how nutrients and water are transported within animals, the circulatory system and the impact of diet, exercise and lifestyle.

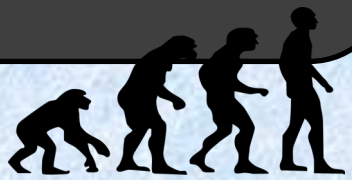


Light

To know that light travels in straight lines, that light travels from light sources and to understand why shadows have the same shape as the objects that cast them.

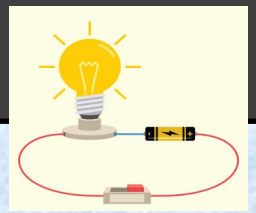
Evolution and Inheritance

To recognise that things have changed over time and that we can learn things from fossils; that living things produce offspring and that animals and plants can adapt to their environment.



Electricity

To compare and give reasons for variations in how components function and to use recognised symbols when representing a simple circuit on a diagram.



Year 1 Skills

Seasonal Changes	• Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies
Animals Including Humans	• 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,
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
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,

Year 1 Vocabulary

Seasonal Changes	Weather (sunny, rainy, windy, snowy etc.), seasons (winter, summer, spring, autumn), sun, sunrise, sunset, day length
Animals Including Humans	Head, body, ears, eyes, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves. Names of animals featured first hand from each vertebrate group. Senses – touch, smell, see, taste, hear, fingers (skin), eyes, nose, ear and tongue.
Everyday Materials	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, rubber, card/ cardboard, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny,
Plants	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, Names of trees in the local area. Names of garden and wild flowering plants in the local area.

Year 2 Skills

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, air) • Notice that humans have offspring which grow into adults • Find out about and describe the basic needs for survival (food, water, air)
Everyday Materials and Their Uses	• 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
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

Year 2 Vocabulary

Animals Including Humans	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta).
Everyday Materials and Their Uses	Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard. Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid. Shape, push/pushing, pull/puling, twist/twisting, squash/squashing, bend/bending, stretch/stretching.
Plants	As for Year 1 plus light, shade, sun, warm, cool, water, grow, healthy.
Living Things and Their Habitats	Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed Names of local habitats e.g. pond, woodland etc. Names of micro-habitats e.g. under logs, in bushes etc.

Year 3 Skills

Rocks and Soils

- 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.

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.

Forces and 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.

Plants

- 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 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.

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.
- Find patterns in the way that the size of shadows change.

Year 3 Vocabulary

Rocks and Soils	Rocks, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, igneous, metamorphic, sedimentary, permeable, impermeable, absorb water, marble, chalk, granite, sandstone, slate, chemical fossil, body fossil, trace fossil, cast fossil, mould fossil, replacement fossil, extinct, organic
Animals Including Humans	Nutrients, nutrition, carbohydrates, protein, fats, vitamins, minerals, sugars, water, fibre, skeleton, bones, joints, muscles, skull, ribs, spine, endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates, muscles, contract, relax, support, protect, move
Forces and Magnets	Force, push, pull, twist friction, surface, magnet, magnetic, magnet, strength, magnetic field, pole, north, south, attract, repel, compass, bar magnet, ring magnet, button magnet, horseshoe magnet, metal, iron, steel
Plants	Flower, seed, leaf, stem, roots, petal, pollen, life cycle, dispersal, fertilisation, germination, ovary, ovule, sepal, stamen, anther, filament, stigma, style, photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)
Light	Light, light source, dark, absence of light reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent, shiny, matt, surface, mirror, sunlight, dangerous

Year 4 Skills

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.

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.
- Recap food groups and eating a balanced diet

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.

Living Things and Their Habitats

- 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. Changes can be natural e.g. flooding, earthquake or by humans and can be positive or negative.

Year 4 Vocabulary

Electricity	Electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, conductor, electrical insulator.
Animals Including Humans	Digestive system, tongue, mouth, teeth, oesophagus, stomach, gall bladder, small intestine, pancreas, rectum, anus, large intestine, liver, duodenum, tooth, canine, incisor, molar, premolar, producer, consumer, carnivore, herbivore, omnivore
Sound	volume, quiet, loud, faint, ear, pitch, high, low, instruments, bang, blow, shake, pluck, soundwave, vibrations, insulation, sound source, decibel
States of Matter	Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection,
Living Things and Their Habitats	Environment, flowering, non-flowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation, positive, negative

Year 5 Skills

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.
Animals Including Humans	• Describe the changes as humans develop to old age.
Forces and Magnets	• 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.
Properties and Changes 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.
Living Things and Their Habitats	• To 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.

Year 5 Vocabulary

Earth and Space	Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets, planets, day, night, axis.
Animals Including Humans	Puberty, life cycle, gestation, growth, reproduce, foetus, baby, fertilisation, toddler, child, adult, old age, life expectancy, adolescence, childhood, adulthood, womb, life, death
Forces and Magnets	Force, push, pull, opposing, gravity, air resistance, water resistance, friction, streamline, brake, gear, mechanism, lever, cog, pulley, machine, Earth
Properties and Changes of Materials	Material, conductor, dissolve, insoluble, suspension, chemical, physical, irreversible, solution, reversible, separate, mixture, insulator, transparent, flexible, permeable, soluble, property, magnetic, hard.
Living Things and Their Habitats	Sexual, asexual, reproduction, cell, fertilisation, pollination, male, female, pregnancy, gestation, mammal, metamorphosis, amphibian, insect, egg, embryo, bird, plant. Life cycle, reproduce, sperm, live young, asexual, plantlets, runners, bulbs, cuttings

Year 6 Skills

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.
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.
Evolution and 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
Living Things and Their Habitats	• To 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.
Light	• 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.

Year 6 Vocabulary

Electricity	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch (open and closed), current, voltage N.B. Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably
Animals Including Humans	Circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary, digestive, transported, gas exchange, nutrients, water, oxygen, alcohol, drugs, tobacco, pulse, rate, pumps, carbon dioxide, muscles, cycle, diet, lifestyle
Evolution and Inheritance	Evolution, adaptation, inherited traits, inherited, adapted, natural selection, DNA, genes, variation, parent, offspring, fossil, environment, habitat, fossilisation, sexual reproduction, vary, characteristics, suited, species.
Living Things and Their Habitats	Classify, compare, bacteria, characteristics, classification, microorganism, organism, invertebrates, vertebrates, flowering, non-flowering, Linnaean, fish, amphibians, reptiles, birds, mammals, insects, spiders, snails, worms.
Light	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, filter, colour, absorb, refract, spectrum, wavelength, prism, visible, lens, angle, incidence, straight, ray, beam, wave.