Newton Hill Community School
Science Context of Progression

Biology
Plants

Year 1	Year 2	Year 3
This unit is part of the discipline of biology- the study of organisms (living things). It follows on from learning in EYFS about the seasons, weather associated with the seasons and an introduction to changes that happen to the plants during those seasons. **In Year 1, the pupils learn about the names of common plants and trees and learn to identify them by their leaves. They learn about the term's 'evergreen' and 'deciduous' and how deciduous plants fit into the change of the seasons. Children will be able to identify and name a variety of common wild and garden plants and be able to distinguish the difference between them.** This unit comes before work studied in Year 2, where pupils will recap common plants and trees studied in Year 1, before moving onto observing how plants grow, what they need to grow healthily and the differences between bulbs and seeds in Year 2. In Year 3 the children will extend their knowledge to include germination and pollination.	This unit follows on from learning in Reception about the seasons and changes that happen to the plants during those seasons. They have also recognised some fruits and vegetables and begun to name the basic parts of a plant. In Year 1 the pupils learned about the names of common plants and trees and how to identify them by their leaves. They learn about the terms 'evergreen' and 'deciduous'**. In Year 2, pupils will recap common plants and trees studied in Year 1 before moving onto how plants grow, what they need to grow healthily and differences between bulbs and seeds. This unit includes an investigation about growing healthy plants.** This comes before work studied in Year 3 where children develop more understanding about what plants need to grow healthily, exploring the requirements for life and growth and how they vary from plant to plant. They will also investigate the way in which water is transported within plants and explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	This unit follows on from year 1 and 2. Pupils are able to identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Pupils are also able to identify and describe the basic structure of a variety of common flowering plants, including trees. During this unit, pupils revise a significant amount of knowledge from Year 2. **In Year 3 the children focus on revising the parts of a plant/tree and extend their knowledge by understanding the function of each part of a flowering plant; exploring the requirements of plants for life and growth and how they vary from plant to plant. This unit also reviews and builds upon pupils' knowledge of germination, pollination and life cycle diagrams. New learning also includes seed formation and the four methods of seed dispersal. Pupils investigate the way in which water is transported within plants.** The knowledge acquired in this unit will help pupils to group and classify living things in Year 4. This unit comes before work studied in Year 5 when pupils construct food chains and in Year 6 when pupils study Linnaean classification, adaptations and sexual reproduction in plants.

Biology
Animals, including humans

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
This unit is the first of eight science units where pupils study animals, including humans, as part of the discipline of biology - the study of organisms. From Reception, pupils can name common animals and their babies. Pupils also know that animals that live in particular habitats and know some common features of mini beasts. In Year 1, pupils further develop their knowledge of animals as they are introduced to the concept of 'families' and how animals are grouped according to their shared properties including fish, amphibians, reptiles, birds and mammals. Pupils learn the key features of each animal family and group them into their correct families. New learning includes identifying and naming a variety of common animals that are carnivores, herbivores and omnivores. Pupils identify, name, draw and label the basic parts of the human body. Pupils also learn about the senses. This unit is the precursor to work studied in Year 2 where pupils learn about how animals, and humans, grow and change. Pupils study life cycles of humans and animals such as butterflies, chickens and frogs.	This unit is the second of eight science units where pupils study animals, including humans, as part of the discipline of biology - the study of living organisms. Pupils have a secure knowledge of common animals, their babies and their habitats. Pupils can identify and name a variety of common animals that are carnivores, herbivores and omnivores. Pupils can identify, name, draw and label the basic parts of the human body. In Year 2, pupils study life cycles and learn that animals, including humans, have offspring which grow into adults. New learning includes the basic needs of animals, including humans, for survival and the importance of exercise, eating the right amounts of different types of food, and hygiene. This unit comes before work studied in lower key stage 2, where pupils learn to classify and group animals and learn about skeletons in Year 3 and vital organs and the digestive system in Year 4. In Upper Key Stage 2, pupils continue their learning looking in more depth at food chains, life cycles, vital organs and the circulatory systems (Year 6).	This unit is the fourth of eight science units where pupils study animals, including humans, as part of the discipline of biology. Pupils have a secure knowledge of life cycles and what animals, including humans, need to survive and the importance of a healthy lifestyle. Pupils can identify and name a variety of animals. Pupils can use classification keys to help group, identify and name a variety of living things in their local and wider environment. In this Year 3 unit, pupils learn 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. Pupils further develop their knowledge of what humans need to thrive by learning about a balanced diet, including how sugar can cause tooth decay and obesity, the food groups and their role in human development. New learning includes how humans and some other animals have skeletons and muscles for support, protection and movement. This unit is the precursor to work in year 4 as pupils learn about the digestive system, teeth and food chains. The knowledge acquired in this unit will help pupils in Year 5 as they learn about puberty and gestation periods of animals before studying the circulatory system in Year 6.	This unit is the sixth of eight science units where pupils study animals, including humans, as part of the discipline of biology. Pupils have a secure knowledge of life cycles and what animals, including humans, need to survive. Pupils know the importance of a healthy lifestyle, including a balanced diet and the effects of sugar, the food groups and their role in human development. Pupils can identify and name a variety of animals and can use classification keys to help group, identify and name a variety of living things in their local and wider environment. Pupils know that humans and some other animals have skeletons and muscles for support, protection and movement. In this Year 4 unit, pupils learn about the simple functions of the basic parts of the digestive system in humans. New learning includes identifying the different types of teeth in humans and their simple functions. Pupils construct and interpret a variety of food chains, identifying producers, predators and prey. This unit comes before work in Year 5, where pupils learn about puberty and gestation periods of animals. The knowledge acquired in this unit will help pupils in Year 6 to learn about the circulatory system.	This unit is the seventh of eight science units where pupils study animals, including humans, as part of the discipline of biology. Pupils have a secure knowledge of life cycles and what animals, including humans, need to survive. Pupils can use classification keys and interpret food chains by identifying producers, predators and prey. Pupils know that humans and some other animals have skeletons and muscles for support, protection and movement. Previous learning includes the importance of a healthy lifestyle and their role in human development. Pupils know the functions of the basic parts of the digestive system and the functions of different types of teeth in humans. In this Year 5 unit, pupils learn about the changes a human goes through as they develop across their lifetime. Pupils describe the changes as humans mature to old age and draw a timeline to indicate stages in the growth and development. Pupils learn what older people need to stay healthy and the difficulties they may face. In SRE sessions, pupils learn how babies grow and develop, and about puberty. New learning includes the gestation period and life expectancy of different species of animals. Pupils also undertake an extended study of the Mayfly. This unit comes before work in Year 6 when pupils learn about the circulatory system	This is the final unit of eight science units where pupils study animals, including humans, as part of the discipline of biology. Pupils have a secure knowledge of life cycles and what animals, including humans, need to survive. Pupils know that humans and some other animals have skeletons and muscles for support, protection and movement. Pupils know the functions of the basic parts of the digestive system and the functions of different types of teeth in humans. Previous learning includes the changes a human goes through as they develop across their lifetime. Pupils know what older people need to stay healthy and the difficulties they may face as a result of old age. This Year 6 unit builds on pupils' knowledge of the importance of a healthy lifestyle. New learning includes recognising the impact of diet, exercise, drugs and lifestyle on the way their bodies function. In Year 6, pupils identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Pupils also describe the ways in which nutrients and water are transported within animals, including humans. This comes before work studied in KS3 when pupils continue to study the human body.

Biology
Living Things and Their Habitats

Year 2	Year 4	Year 5	Year 6
Prior to this unit, pupils will have already started to look at habitats by looking at minibeasts in Reception. In Year 2, pupils will learn about the food chains of animals in varying habitats and will look at microhabitats and the animals that live there. Children will learn how animals obtain their food, by constructing a simple food chain. They will also learn how to determine if something is alive, was once alive or never lived, using the acronym MRS GREN. This unit comes before work in Year 4, where pupils will continue learning about habitats by grouping animals into categories, such as vertebrates/ invertebrates, before pupils move on to identify how animals and plants are adapted to suit their environment in different ways in Year 5. Throughout Year 5, pupils further develop their knowledge of the seven life processes.	This unit is the fourth of six science units where pupils learn about plants and animals as part of the discipline of biology. Pupils have a secure knowledge of the functions of the different parts of flowering plants and the requirements of plants for life and growth. They know how water is transported within plants and the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. This Year 4 unit builds upon pupils' prior knowledge of plants as they identify and name a variety of living things in their local and wider environment. Pupils group living things and begin to use classification keys for flowers (flowering and nonflowering). Animals are classified into warm blooded and cold-blooded, vertebrates and invertebrates. New learning includes knowing the names of common woodland species. Pupils learn that environments can change and that this can sometimes pose dangers to living things. The knowledge of plants acquired in this unit will help pupils at the end of Year 4 to construct and interpret a variety of food chains, identifying producers, predators and prey. This comes before work studied in Year 6 as pupils identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. They will also describe the life process of reproduction in some plants and animals.	This unit is the fifth of six science units where pupils learn about plants and animals as part of the discipline of biology. Pupils have a secure knowledge of the functions of the different parts of flowering plants and the requirements of plants for life and growth. They know how water is transported within plants and the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Pupils can identify and name a variety of living things and use classification keys to help group plants and animals. In Year 5, pupils revise their prior knowledge of food chains, identifying producers, predators and prey. Pupils identify how animals and plants are adapted to suit their environment in different ways. New learning includes knowing particular species of animals and plants and describing the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Pupils further develop their knowledge of the seven life processes. The knowledge acquired in this unit will help pupils understand the life process of reproduction in some plants and animals. This comes before work in Year 6 when pupils study classification, adaptations and sexual reproduction in plants and animals.	This unit is the last of six science units where pupils learn about plants and animals as part of the discipline biology. Pupils have a secure knowledge of the functions of different parts of the flowering plants and the requirements of plants for life and growth. They know how water is transported within plants and the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Pupils can identify and name a variety of living things in their local and wider environment and use classification keys to help group plants and animals. In Year 5, pupils revise their prior knowledge of food chains, identifying producers, predators and prey. This unit builds on pupils' understanding of how environment can change and that this can sometimes pose dangers to living things. Pupils identify how animals and plants of the Amazon rainforest are adapted to suit their needs. Pupils learn about plants and animal taxonomy (Linnaean classification system – the science that finds, identifies and describes, classifies and names organisms). New learning also includes knowing particular species of animals and plants of the amazon rainforest and describing the difference in the life cycles of a mammal, an amphibian and insect and a bird. Pupils further develop their knowledge of the seven life processes. The knowledge acquired in this unit will help children understand the life processes of reproduction in some plants and animals. This is the precursor to work studied in the last science unit, when pupils study adaptation and evolution.

Chemistry Everyday Materials

(Rocks, State of Matter and Properties and Changes of Materials)

Year 1	Year 2	Year 3	Year 4	Year 5
This unit is the first of five science units where pupils study materials as part of the discipline of chemistry - the identification of the properties a substance is made from. In this Year 1 unit, pupils identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Pupils distinguish between an object and the material from which it is made including if it is 'man-made' or 'natural'. New learning includes describing the simple physical properties of a variety of everyday materials. The knowledge acquired will help pupils at the end of the unit as they compare and group together a variety of everyday materials on the basis of their simple physical properties. This unit comes before work in Year 2 as/where pupils compare the suitability of objects and compare how different materials can be changed in different ways.	This unit is the second of five science units where pupils study materials as part of the discipline of chemistry - the identification of the properties a substance is made from. Pupils have a secure knowledge from Year 1 of the properties of a variety of everyday materials. Pupils can identify, name and describe an object in terms of the material is made from including if it is 'man-made' or 'natural'. Previous learning includes comparing and grouping together everyday materials on the basis of their simple physical properties. This Year 2 unit builds on pupils' knowledge of materials and their properties, as pupils identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses. This unit will help pupils understand how squashing, bending, twisting and stretching can change the shapes of some solid objects. This comes before work studied in Year 3, rocks and soils. The knowledge acquired will help pupils in Year 4, as pupils study materials in terms of solid, liquid and gases. In Year 5, pupils learn about dissolving, mixing and changes of state, and reversible and irreversible changes.	This unit is the third of five science units where pupils study materials as part of the discipline of chemistry. It is also the study of forces as part of the discipline of physics. Pupils have a secure knowledge of the properties of materials and can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses. Pupils know that squashing, bending, twisting and stretching can change the shapes of some solid objects. This year 3 unit builds on pupils' knowledge of properties of materials as pupils learn about rocks and soils. New learning includes comparing and grouping together different kinds of rocks on the basis of their appearance and simple physical properties. Pupils describe how fossils are formed when things that have lived are trapped within rock and recognise that soils are made from rocks and organic matter. The knowledge acquired of rocks and soils during this unit will help pupils understand the significance of the life and works of palaeontologist Mary Anning. This supports the knowledge pupils acquire in the previous science unit on forces and magnets where pupils 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. This unit is the precursor to work studied in Year 4 as pupils study materials in terms of solids, liquids and gases. Year 5 pupils learn about dissolving, mixing and changes of state, and reversible and irreversible changes. Pupils also build on previous knowledge of magnetic and non-magnetic metals.	This unit is the fourth of five science units where pupils study materials as part of the discipline of chemistry. It is also the study of forces as part of the discipline of physics. Pupils have a secure knowledge of the properties of materials and can identify and compare the suitability of a variety of everyday materials. Previous learning includes knowing that squashing, bending, twisting and stretching can change the shapes of some solid objects. Pupils can compare and group different kinds of rocks on the basis of their appearance and simple physical properties. Pupils know how fossils are formed and recognise that soils are made from rocks and organic matter. This year 4 unit builds on pupils' knowledge of properties of materials as pupils learn about states of matter. Pupils compare and group materials together, according to whether they are solids, liquids or gases. New learning includes 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). The knowledge acquired during this unit will help pupils understand the water cycle in geography: the part played by evaporation and associate the rate of evaporation with temperature. This unit comes before work studied in Year 5 where pupils learn about dissolving, mixing and changes of state, and reversible and irreversible changes.	This unit is the fifth of five science units where pupils study materials as part of the discipline of chemistry. It is also the study of forces as part of the discipline of physics. Pupils have a secure knowledge of the properties of materials and can identify and compare the suitability of a variety of everyday materials. Pupils know that squashing, bending, twisting and stretching can change the shapes of some solid objects. Previous learning includes knowing different kinds of rocks based on their appearance and simple physical properties. Pupils know how fossils are formed and recognise that soils are made from rocks and organic matter. In this Year 5 unit, pupils further develop their knowledge as they compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, electrical and thermal conductivity. Pupils revise their prior knowledge of magnetic and non-magnetic metals from Year 3. New learning includes knowing that some materials will dissolve in liquid to form a solution, and knowing how to recover a substance from a solution. This unit also builds on pupils' previous knowledge of states of matter. Pupils know that some materials change state when they are heated or cooled (e.g. evaporation and condensation in the water cycle) and associate the rate of evaporation with temperature. Pupils use their knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. The knowledge acquired during this unit will help pupils understand that dissolving, mixing and changes of state are reversible changes. By the end of the unit, pupils will be able to 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. This unit is the precursor to work studied in KS3 as pupils continue to learn about states of matter.

Physics
Light

Year 3	Year 6
This unit is the first of two science units where pupils learn about light as part of the discipline of physics. Pupils have a secure knowledge of the terms opaque, transparent and translucent. They know what plants need, including **light**, to grow well and how energy from **light** is the start of a food chain. This unit builds upon pupils' prior knowledge of materials as they recognise that shadows are formed when an opaque object blocks the light from a light source. Pupils find patterns in the way that the size of shadows changes. In Year 3, pupils learn we need light in order to see things and that dark is the absence of light. New learning includes that light is reflected from surfaces and it can be separated into a prism of colours. Pupils learn that light from the sun can be dangerous and that there are ways to protect their eyes. This is the precursor to work studied in Year 6, as pupils learn how shadows are formed. The knowledge acquired in this unit will help pupils to understand how light travels in straight lines and how the amount of light entering the eye is controlled by the pupil.	This unit is the second of two science units where pupils learn about light as part of the discipline of physics. Pupils have a secure knowledge of the terms opaque, transparent and translucent. Previous learning includes pupils knowing we need light in order to see things and that dark is the absence of light. This unit builds upon pupils' prior knowledge that shadows form when the light from a light source is blocked by an opaque object. Pupils already know that light is reflected from surfaces and it can be separated into a prism of colours. New learning includes knowing how light appears to travel in straight lines. Pupils learn that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. This new knowledge acquired in Year 6 is used to explain why shadows have the same shape as the objects that cast them and that those objects are seen because they give out or reflect light into the eye. This comes before work studied in KS3 as pupils continue to learn about how light can be reflected, refracted and dispersed.

Physics
Electricity

Year 4	Year 6
This unit is the first of two science units where pupils learn about electricity as part of the discipline of physics - the study of the processes that shape our world and how we use it. Children will have limited prior knowledge before studying this unit. During this Year 4 unit, pupils identify common appliances that run on electricity and construct a simple series electrical circuit, identifying and naming its basic parts. Pupils investigate 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. Pupils recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. They recognise some common conductors and insulators, and associate metals with being good conductors. The knowledge acquired in this unit will help pupils to compare and group together everyday materials on the basis of their properties, in terms of conductivity, in Year 5. This is the precursor to work studied in Year 6 when pupils use recognised symbols when representing a simple circuit in a diagram. Pupils investigate the brightness of lamps or the volume of buzzers with the number and voltage of cells used in the circuit. Pupils compare and give reasons for variations in how components function.	This unit is the second of only two science units where pupils learn about electricity as part of the discipline of physics. Pupils are able to identify common appliances that run on electricity. Pupils have a secure knowledge of simple series electrical circuits including that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. They know some common conductors and insulators, and associate metals with being good conductors. In Year 6, pupils revise and build upon their previous knowledge of electrical circuits as they use recognised symbols when representing a simple circuit in a diagram. New learning includes associating the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Pupils 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.

Physics
Forces

Year 3	Year 5	Year 5 (Earth and Space)
This unit is the first of three science units where pupils study forces as part of the discipline of physics. There are also many links to the discipline of Chemistry. Pupils have a secure knowledge of resistance and friction, are able to compare how things move on different surfaces and know that applying forces to objects can change their shape. This Year 3 unit builds on pupils' knowledge of how things move on different surfaces with a focus on the force friction. New learning is based on magnetism as pupils notice that some forces need contact between two objects, but magnetic forces can act at a distance. Pupils describe magnets as having two poles and observe how magnets attract or repel each other. Pupils further develop their knowledge of everyday materials as they compare and group according to whether they are attracted to a magnet, and identify some magnetic materials. The knowledge acquired in this unit will help pupils as they learn more about materials and their properties. This unit comes before work in Year 5. where pupils revise magnetism and learn about thermal and electrical conductivity.	This unit is the second of three science units where pupils study forces as part of the discipline of physics. There are also many links to the discipline of chemistry. Pupils have a secure knowledge of resistance and friction and know that applying forces to objects can change their shape. In Year 5, pupils revise and build upon previous learning on magnetism. They know some forces need contact between two objects, but magnetic forces can act at a distance. Pupils know magnets have two poles and that they attract or repel each other. Pupils further develop their knowledge of magnetic and non- magnetic materials with thermal and electrical conductivity. New learning in this unit includes knowing that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Pupils study the effects of air resistance, water resistance and friction, that act between moving surfaces. The knowledge acquired in this unit will help pupils as they learn more about materials and their properties. This unit comes before later in year 5 when pupils study the movement of the Earth in space.	This unit is the last of three science units where pupils study forces as part of the discipline of physics. There are also many links to the discipline of chemistry. Pupils have a secure knowledge of the effects of air resistance, water resistance and friction, that act between moving surfaces. Pupils know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Pupils know about magnetic and non- magnetic materials, and thermal and electrical conductivity. In this Year 5 unit, pupils describe the Sun, Earth and Moon as approximately spherical bodies. New learning includes knowing about the movement of the Earth, and other planets, relative to the Sun in the solar system. Pupils learn the movement of the Moon relative to the Earth. By the end of the unit, pupils use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. This unit is the precursor to work studied in KS3 when pupils continue to study forces as part of the discipline of physics.