Cronton CE Primary School KEYS Curriculum Curriculum Sequencing for Science

Electricity – Physics			
End points for EYFS **Understanding of the world**	**End Points for KS1**	**End Points for LKS2** Y4:Electricity	**End Points for UKS2** Y5: Choosing and Changing Materials Y6: Electricity
Children can: Start to understand that some objects need electricity to work. Start to understand that a switch will turn something on or off.		Children can: Identify common appliances that run on electricity. Construct a simple series electrical circuit. Identify and names: cells, wires ,bulbs ,switches ,buzzers Identify whether a bulb will light in a series circuit that is not a completed loop with a battery. (closed circuit). Recognise that a switch opens and closes a circuit and associate this with whether or not the bulb lights in a circuit. Recognise some common conductors and insulators and associates metals with being good conductors. Understand how electricity should be used safely.	Children can: Compare and group together everyday materials on the basis of their properties including, electrical conductivity. (Y5) Understand the importance of the major discoveries in electricity. Recognise that all matter is made up of atoms (tiny particles too small to be seen by the human eye). Describe atoms as being made up of: protons (+ve electrical charge), neutrons, electrons (-ve electrical charge). Understands that static electricity is caused when electrons are transferred. Describe electricity as a flow of electrons. Understand how electricity should be used safely. Use recognised symbols when representing a simple circuit diagram.

			Associate the brightness of a bulb or the volume of a buzzer with the number and voltage of cells in a circuit. Understand the term electrical potential/energy. (simple) Compare and gives reasons for variations in how components function, including: brightness of bulbs, loudness of buzzers, on/off position of switches.
Teacher information EYFS: Have some understanding that: • certain objects need electricity to work. • a switch will turn something on or off e.g. CD player.		Teacher information Y4: To understand how we can **control** electricity through: • closed /open circuits; • switches • type of material(conductors, insulators).	Teacher information Y5: To understand that electrical **conductivity** can be a property of a material. Y6: To understand how we can **vary the effects** of electricity through: • changing voltage • changing components
Forces and Magnets: Including Seasonal Changes and Earth and Space- Physics			
End points for EYFS Understanding of the world	**End Points for KS1** Y1: Seasons and Weather Y2:Forces and Magnets	**End Points for LKS2** Y3: Forces in Action	**End Points for UKS2** Y5: Choosing and Changing Materials Y5: Earth and Space Y6: Energy: Light, Sound (pitch) and Forces.
Children can: Recognise similarities and differences in relation to places, objects, materials and living things (seasons). Make observations of animals and plants and explain why some things occur, and talk about changes**.** Talk about the features of their own immediate environment and how environments might vary .	Children can: **Y1** :Recognise changes across the four seasons. Describes weather associated with the seasons and how day length varies . Describe changes in the weather between the different seasons. *Explain why specific clothing is suited to different seasons (Materials)*	Children can: **Y3**:Understand that some forces need contact but that others can act from a distance:non-contact—magnetic force and gravitational force. 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.	Children can: **Y5:** Compare and group together everyday materials on the basis of their properties including magnetic. **Y5**:Describe the Sun, Earth and Moon as approximately spherical bodies. Describe the movement of the Earth and other planets relative to the Sun in the solar system and link to work on gravitational force in Y3.

	Explain how animals cope with cold winter weather.(Animals including Humans).		Understand that a vacuum in space is an absence of matter. Describe the movement of the Moon relative to the Earth. Understand how lunar eclipses occur. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.
	Y2:Describe a force as a push or pull and understand how things move on different surfaces. Explain how a force exerted on an object can change the speed, direction of movement and shape of an object. Explain how magnets attract or repel each other— noticing that some forces need contact but magnetic forces can act at a distance. Sorts materials depending on whether they are magnetic/ non-magnetic and identify magnetic materials - iron, nickel. Predict correctly whether two magnets will attract or repel each other depending on which poles are facing.		***Y6****: Know that sound and light are forms of energy and that* use of a force involves a transfer of energy. *Explain how evidence from enquiries show that light travels in straight lines. e.g. periscopes(Y3 to cover shape and patterns of shadows)* *Explain with diagrams/ models how the path of light rays can be directed by reflection to be seen.* *Describe(do not need to understand why these occur) a range of phenomena including rainbows, soap bubbles, objects looking bent / refracted in water and coloured filters. (Light)* *Describe patterns between the pitch of a sound and features of the object that produced it.(Sound)* Recognise that some simple mechanisms, including levers, pulleys and gears, allow a smaller force / transfer of energy to have a greater effect.

			Understand the difference between mass and weight. Understand the effects of the friction, air resistance and gravity in relation to levers, pulleys and gears
Teacher Information EYFS: To explore, observe and talk about seasonal changes through the year by: • Accessing the outdoor provision and school grounds which includes fruit trees, a woodland area and minibeast hotels. • Busy Books used at home and brought into school for discussion encourage the collection and discussion of items representing the seasons. To explore toys with moving or magnetic parts e.g. wheels, pulleys, wheelbarrows, trolleys, ramps,magnetic games, water play – continuous provision indoor and outdoor(Forces). .	Teacher Information Y1: To understand how the seasons change our environment- light/weather/length of day and how themselves and animals adapt to this. Y2: To understand how things move on different surfaces and how magnets behave, as an introduction for later work on non-contact forces.	Teacher Information Y3: To understand how things move (forces including gravity)) or stop without being touched (the effects of friction, air resistance and water resistance).	Teacher Information Y5: To review from Y2 that magnetic/non-magnetic is a property of a material and is a non-contact force. Y5: To understand the relative positions of the Sun, Earth and moon; which are moving (gravitational force), why and how this affects the environment on Earth e.g. day and night. Y6: *To understand that light and sound are types of energy* and that use of a force involves a transfer of energy. To understand that simple machines allow a smaller force to have a greater effect/transfer of energy. Y6: To understand that light and sound (pitch) are types of energy and that

			when a force is used in a simple machines (levers, gears and pulleys) it is a transfer of energy and allows a smaller force to have a greater effect. To build on the work on light in LKS describing the way that light behaves.
Light, Sound (Types of Energy) – Physics			
End points for EYFS **Understanding of the world**	**End Points for KS1** Y1: Seasons and Weather Y1 : Senses	**End Points for LKS2** Y3: Light Y4: Vision and Movement Y4: Sound and Hearing	**End Points for UKS2** Y6: Energy: Light, Sound and Forces
Children can: Recognise similarities and differences in relation to places, objects, materials . Talk about the features of their own immediate environment and how environments might vary . .	Children can: **Y1**: Recognise changes across the four seasons. Describes weather associated with the seasons and how day length varies . Describe changes in the weather between the different seasons. *Explain why specific clothing is suited to different seasons (Materials)* *Explain how animals cope with cold winter weather.(Animals including Humans).*	Children can: **Y3**:Recognise that they need light in order to see things and that dark is the absence of light. Understand that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Understand that shadows are formed when the light from a light sources is blocked by an opaque object - link to light travelling in a straight line to explain the shape of the shadow. Explain patterns in the way that the size of shadows change.	Children can: **Y6**:Know that sound and light are forms of energy *and that use of a force involves a transfer of energy* Explain how evidence from enquiries show that light travels in straight lines. e.g. periscopes(Y3 to cover shape and patterns of shadows) Explain with diagrams/ models how the path of light rays can be directed by reflection to be seen. Describe(do not need to understand why these occur) a range of phenomena including rainbows, soap bubbles, objects looking bent / refracted in water and coloured filters Describe patterns between the pitch of a sound and features of the object that produced it.
	Y1:Say which part of the body is associated with which sense – sight,hearing.	**Y4**: Use the idea that light travels in straight lines to explain that objects are seen because light travels from light sources to our eyes or from light sources to objects and then to our	

		eyes. Understand the structure and function of the human eye. *Recognise the structure and functions of the human skeleton to include: support, protection, movement (interaction between skeleton and muscles). (Animals including Humans)* **Y4:** Identify how **sounds** are made—association with **vibration**. Recognise that vibration from sounds travel through a medium to the ear. *Understand the basic structure and function of the human hearing system (Animals Including Humans).* 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	*Recognise that some simple mechanisms, including levers, pulleys and gears, allow a smaller force / transfer of energy to have a greater effect.(Forces)* *Understand the difference between mass and weight.(Forces)* *Understand the effects of the friction, air resistance and gravity in relation to levers, pulleys and gears. (Forces)*
Teacher Information Developing an understanding of change. Observe and explain why certain things may occur. Look closely at similarities, differences, patterns and change – torches/coloured filters. Comments and questions about the place they live or the natural world	Teacher Information Y1: To understand how the seasons change our environment-light/weather/length of day and how themselves and animals adapt to this. Y1: To understand that our eyes/ light are associated with the sense of sight.	Teacher Information Y3: To understand that dark/shadow is the absence of light and that shadows take the shape of an object because light travels in straight lines. Y4:*To understand how our bodies are designed to help us* see/ linked to light travelling in straight lines/ function of the eye *and move: for survival.* Y4:*To understand how our bodies are designed to help us hear*- that sound involves vibration travelling through a medium and how the sound we hear is affected by strength of vibration and distance from the sound source.	Teacher Information Y6: To understand that light and sound (pitch) are types of energy and that when a force is used in a simple machines (levers, gears and pulleys) it is a transfer of energy and allows a smaller force to have a greater effect. To build on the work on light in LKS describing the way that light behaves.

Materials – Chemistry

End points for EYFS **Understanding the World**	End Points for KS1 Y1: Recycling Paper(Eco-Topic) Y1: Materials Y2: Uses of Materials Y2: Recycling Plastic (Eco- Topic)	End Points for LKS2 Y3: Rocks Y4: Matter: Solids, Liquids and Gases.	End Points for UKS2 Y5: Choosing and Changing Materials Y5: Geology of the Earth Y5: Pollution (Eco-Topic) Y6:Energy resources: Renewable and Non-Renewable (Eco-Topic)
Children can: Recognise similarities and differences in relation to objects, materials. .	Children can: Y1: Identify, name and describe the simple physical properties of the materials below. **Materials / Properties** wood — hard/soft pulp — bendy/stiff, paper — shiny/ dull rough/smooth, breaks/tears not see through,/see through. wet/sticky/dry Recognise that paper comes from wood from trees and that the paper they use comes from forests around the world. Understand how paper is made – wood ,pulp, paper and explain how paper can be recycled. *Understand the link between recycling paper and taking care of the Earth*	Children can: Y3:Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties; understanding that differences can be identified by testing. Describe weathering and erosion by water and weather. Describe in simple terms how fossils are formed—when things that were once alive are trapped within rock. Recognise that soils are made from rocks and organic matter and make comparisons between different soil types. Y4:Compare and group materials together according to whether they are solids, liquids or gases: thinking about the arrangement and movement	Children can: Y5: Compare and group together everyday materials on the basis of their properties including: hardness, solubility transparency, conductivity (electrical, thermal),response to magnets. Give reasons based on evidence from comparative and fair tests for the particular uses of everyday materials including metals, wood and plastic. Understand that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. Use their knowledge of solids, liquids and gases to decide how mixtures might be separated, including :filtering, sieving, evaporating. Understand that dissolving, mixing and changes of state are reversible

	.(Living things and their habitats) *Recognise their role in recycling to take care of the Earth. (Living things and their habitats)* *Understand the concept of <u>global</u> sustainability (enough for all for ever)and how it applies to recycling. (Living things and their habitats)*	of particles in each. Recognise that some materials change state when they are heated or cooled and measure or research the temperature at which this happens in degrees Celsius. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	changes. Explain that some changes result in the formation of new material and that this kind of change is not reversible. Including changes associated with burning and the action of acid on bicarbonate of soda. Y5:Understand that the Earth is made of layers; the crust, mantle, core (outer core and inner core). (Revisit states of matter/rock - extend with molten) Describe the Earth as being formed from tectonic plates.(Revisit rock) *Understand that the movement of tectonic plates causes earthquakes.(Forces)* *Know that the intensity of an earthquake is measured using a seismograph and Richter scale.(Forces)* Know how volcanoes are formed and that volcanoes can be active, dormant and extinct.(Revisit states of matter/rock – extend with molten) *Understand theories of how the continents and oceans were formed: Pangaea and continental drift. (Forces)* Understand that most of the Earth's surface is covered by water.
	Y1: Identify and name a variety of everyday materials. 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 properties.		
	Y2: Distinguish between an object and the material from which it is made. Identify, and compare the suitability of everyday materials for particular uses .		

Materials	Properties
wood, paper as above plus: plastic, glass, metal, water, rock, brick, fabric, plastic, foil, card, cardboard.	As above plus: stretchy, , floppy, waterproof, absorbent.

Materials	Properties
As above plus: rubber, wool, clay, elastic	As above plus: flexible/ rigid (link to bendy/stiff in Y1) reflective/non reflective (link to shiny/dull in Y1) opaque, transparent, translucent (link to see through/not see through Y1)

Understand that the shape of some materials can be changed by squashing,
bending, twisting and stretching.

Describe the work of scientist and inventor John Mc Adam.

Y2: Recognise that plastic is a manmade material as oppose to a natural material.

Understand the problems with plastic recycling and that recycling alone will not solve the plastic problem.

Describe how plastic affects marine life recognising that a change in environment can sometimes pose a danger to living things. (Living Things and their Habitats).

Understand the link between recycling plastic and taking care of our Earth.

Y5:Identify and discuss different kinds
of pollution -to include air quality.

Identify and discuss sources of pollution.

Recognise why it is important to keep the environment pollution free including climate change.

Understand the link between pollution and taking care of the Earth .

Recognise their role in preventing pollution and taking care of the Earth.

Understand the term <u>global</u> sustainability and how it applies to pollution. (Living Things and Their Habitats)

Y6:Explain the difference between renewable and non-renewable energy resources.

Understand that fossil fuels are a finite resource.(coal, natural gas ,oil).

Describe the environmental impact of
fossil fuels: carbon dioxide and global
warming, greenhouse effect, oil spills,
acid rain.

Recognise advantages and

	Recognise their role in recycling to take care of the Earth. Understand the concept of global sustainability (enough for all for ever)and how it applies to recycling.		disadvantages of both types of energy resources (including climate change). *Recognise their role in sustaining energy resources and taking care of the Earth.* *Understand the link between energy resources and global sustainability*. (Living things and their Habitats)
Teacher Information Discuss the things they have observed such as natural and found objects. Manipulate materials to achieve a planned effect.	Teacher Information Y1: To understand where paper comes from (materials involved) and *what happens to the paper we throw away*. Y1: To understand what things are made from and their properties. Y2: To understand why we choose materials for a purpose and how we can change materials – ctd in Y5 Y2: To understand what happens to the plastic we throw away and *how we are putting marine life in danger.*	Teacher Information Y3: To understand how rocks are different: properties including fossils) and how different types of soil are made from rocks. Y4: To understand the three states of matter: gas, solid, liquid and that water is not always wet.(Linked with the water cycle in geography).	Teacher Information Y5: To build on work in Y2- understanding how we choose materials for a purpose and how we can change materials – reversibly and irreversibly. Y5: To understand which materials are in the centre of the Earth and link this to volcanoes, earthquakes and how the continents were formed. Y5: To explain what pollution is and be aware of how humans are putting living organisms in danger. Y6: To be able to answer the question – can all materials that we use up be replaced? (|Linked with work in geography)
Living Things and their Habitats including : Evolution and inheritance – Biology			
End points for EYFS .	**End Points for KS1** Y1: Recycling Paper Y1: Plants Y2: Recycling Plastic Y2: Living Things and their Habitats	**End Points for LKS2** Y3: Save Our Bees Y4: Classification of Living Things Y4: Destruction of Habitats	**End Points for UKS2** Y5: Pollution Y6: Evolution and Inheritance Y6: Energy Resources: Renewable/ Non-Renewable Y6: Life Cycles and Reproduction

Children can: Recognise similarities and differences in relation to living things Make observations of animals and plants and explain why some things occur, and talk about changes. Talk about the features of their own immediate environment and how environments might vary from one another. Children care about their immediate environment and know that they can have an impact on the wider world. Children can explain why different animals survive in a range of environments	Children can: ***Y1:*** *Identify, name and describe the simple physical properties of the materials wood and paper.* *Recognise that paper comes from wood in trees and that the paper they use comes from forests around the world* *Understand how paper is made* *Explain how paper can be recycled. .(Materials).* Understand the link between recycling paper and taking care of the Earth. Recognise their role in recycling to take care of the Earth. Understand the concept of <u>global</u> sustainability (enough for all forever) and how it applies to recycling. ***Y1****:Identify and describe the basic structure of a variety of common flowering plants, including trees.* *Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.(Plants)* Understand, by looking at evidence, that plants are living things: they grow, need nutrients, move (shoots grow; leaves turn toward the Sun; flowers open and close etc) and reproduce. (link with seasons and weather*)*	Children can: **Y3**: *Describe the life cycle of an insect - the bee.* (Animals including humans) Recognise the distinguishing characteristics of insects. *Recognise the role of the bee in pollination understanding that insects can be helpful as well as harmful.(Plants)* Explain why bees are dying. Understand the link between bees and taking care of the Earth. Explain how to be 'bee friendly' and take care of the Earth. Understand the term <u>global</u> sustainability and how it applies to bees.	Children can: ***Y5****:Identify and discuss different kinds of pollution -to include air quality. Identify and discuss sources of pollution. (Materials)* Recognise why it is important to keep the environment pollution free.—including climate change. Understand the link between pollution and taking care of the Earth. Recognise their role in preventing pollution and taking care of the Earth. Understand the term <u>global</u> sustainability and how it applies to pollution. **Y6:**Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Describe the structure of an animal cell:cell membrane, nucleus,nuclear membrane DNA/genes, cytoplasm, vacuole and cf plant cell –cell wall, chloroplasts – covered in Y5. Know that DNA/genes , found in the nucleus of an animal and plant cell determine an organisms characteristics.

	Find out and describe how plants need water, light and a suitable temperature (linked with seasons and weather) to grow and stay healthy.(Plants)		Recognise that living things produce offspring of the same kind but normally offspring vary and are not identical to their parents. Understand that variation can also be caused by mutation when the DNA in the offspring changes randomly. Recognise that variation and mutation can lead to advantageous and disadvantageous characteristics and how this relates to natural selection. Understand that natural selection results in evolution (changes over time). Understand and compare the work of Charles Darwin and Alfred Wallace. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. ***Y6****:Explain the difference between renewable and non-renewable energy resources: understanding that fossis fuels are a finite resource.(coal, natural gas,oil). (Materials)* Recognise advantages and disadvantages of both types of
	Y2*: Recognise that plastic is a manmade material as oppose to a natural material.* *Understand the problems with plastic recycling and that recycling alone will not solve the plastic problem(Materials)* Describe how plastic affects marine life recognising that a change in environment can sometimes pose a danger to living things. Understand the link between recycling plastic and taking care of our Earth. Recognise their role in recycling to take care of the Earth. Understand the concept of <u>global</u> sustainability (enough for all for ever)and how it applies to recycling plastic.	**Y4**: 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. Describe and give reasons for how plants and animals (including micro-organisms) are classified into broad groups, based on observable characteristics - similarities and differences. *Construct and interpret a variety of food chains, identifying producers, consumers (predators ,prey and decomposers)(Animals Including Humans)* **Y4**: Recognise that habitats can change and that this can sometimes be a danger to living things. Explain the difference between natural and man-made environmental changes. Research an endangered species and understand the changes that led to their decline. Understand the link between
	Y2: Explore and compare the differences between things that are living, dead and things that have never been alive. *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 including fish, amphibians,reptiles, birds and mammals.* *Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Animals including Humans)* Recognise that living things can be grouped in a variety of ways (as above). Identify that most living things (including plants) live in habitats to which they are suited and on which they depend. (including microhabitats). Identify and name a variety of plants and animals in their habitats including microhabitats. Using a simple food chain describe how animals obtain their food from plants and other animals .	destruction of habitats and taking care of the Earth. Recognise their role in looking after habitats and taking care of the Earth. Understand the term <u>global</u> sustainability and how it applies to habitats.	energy resources including the environmental impact of fossil fuels e.g. carbon dioxide and global warming,oil spills, acid rain. Recognise their role in sustaining energy resources and taking care of the Earth. Understand the link between energy resources and global sustainability. **Y6**: Links to PSHE Describe the differences in the life cycles of a mammal, an amphibian (frog—external fertilisation), an insect (Bee covered in Y3) and a bird and identify internal or external fertilisation. Describe the changes as humans develop to old age. Know the reproductive organs of humans:testes (sperm), ovaries (eggs) Describe the development of the embryo: egg, zygote, embryo, growt h in uterus, foetus, newborn
Teacher Information Comments and asks questions about the place they live or the natural world. Shows care and concern for living things and the environment – show an awareness of recycling e.g. paper in school and at home.	Teacher Information Y1: T*o understand where paper comes from (materials involved)* and what happens to the paper we throw away. Y1: To understand that different plants (including trees) grow and change – link	Teacher Information Y3: To understand the characteristics of an insect/bee, *its life cycle; what bees need to do to survive and what they can do to help.* Y4: To understand how plants and animals can be grouped/ classified.	Teacher Information Y5: To explain what pollution is and be aware of how humans are putting living organisms in danger. Y6: To understand how living

Can talk about things they have observed such as plants and animals. Notices features of objects in their environment. Children can explain why different animals survive in a range of environments.	with seasons and the weather, water, light and seasonal temperatures. Y2: To understand what happens to the plastic we throw away and *how we are putting marine life in danger.* Y2: To understand what is alive, dead or was never alive. *To understand how to group animals by type or by the food they eat – linking to simple food chains. Look at where animals live/habitat and microhabitat*	*Construct and interpret food chains, identifying producers, consumers (predators ,prey and decomposers)* Y4:To understand how living organisms are being put in danger by a change in their habitat; that this change can be natural or man-made and what they can do to help.	organisms (animals and plants) change over time and place through natural selection. Y6: To be able to answer the question – can all materials that we use up be replaced? (|Linked with work in geography). Y6: To describe the life cycles of a mammal, amphibian, bird and insect. *To understand the changes as humans age.* *Know the reproductive organs of humans: testes (sperm), ovaries (eggs) and describe the development of the embryo.*

Animals Including Humans - Biology

End points for EYFS	End Points for KS1	End Points for LKS2	End Points for UKS2
	Y1:Seasons and Weather Y1: Senses Y1: Animals and their Needs Y2: Digestion and Movement.	Y3:Save Our Bees(Eco-Topic) Y3: Digestion and Circulation Y4: Classification of Living Things Y4:Sound and Hearing Y4: Vision and Movement	Y5: Circulation and Respiration Y6: Life Cycles and Reproduction
Children can: Recognise that other children don't always enjoy the same things (e.g .taste, touch, exercise) and are sensitive to this.	Children can: ***Y1****:Observe changes across the four seasons.* *Observe and describe weather associated with the seasons and how*	Children can: **Y3**:Describe the life cycle of an insect - the bee. Recognise the distinguishing	Children can: **Y5:** Understand that organs (e.g. heart, lungs) work together in a system e.g. circulatory system (Recall Y3 work on heart and

Recognise similarities and differences between themselves and others- what makes them unique - and among families, Recognise similarities and differences in other living things: Make observations of animals and explain why some things occur, and talk about changes. Understand the importance of hygiene, exercise and eating healthy snacks.	*day length varies.* *Compare the weather between the different seasons.(Forces)* Explain why specific clothing is suited to different seasons. Consider how animals cope with cold winter weather. **Y1:** 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 the importance for humans of :exercise, hygiene. **Y1:** Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) . Understand that most animals including humans cannot make their own food; they get nutrition from what they eat. Recognise that animals, including humans, need the right types and amount of nutrition. Eat Well wheel- recognise food groups Notice that animals, including humans, have offspring which grow into adults. Understand how to take care of pets. ***Y2****:Explore and compare the differences between things that are living, dead and things that have never been alive.(Living things and their*	characteristics of insects *Recognise the role of the bee in pollination understanding that insects can be helpful as well as harmful.(Plants)* *Explain why bees are dying.* *Understand the link between bees and taking care of the Earth.* *Explain how to be 'bee friendly' and take care of the Earth. (Living Things and their Habitats)* *Understand the term <u>global</u> sustainability and how it applies to bees.* **Y3:** Understand that all living things are made up of units called cells and that these are too small to be seen without a microscope. Recognise that all cells need energy to survive and that animals including humans need to take in this energy in the form of food.(they cannot make their own food like plants). Identify that animals including humans need the right type and amount of nutrition. Describe the simple functions of the basic parts of the digestive system in humans: teeth—incisor, canine, molar, premolar, mouth, saliva, salivary glands tongue, oesophagus, stomach, small	circulation). Identify and name the main parts of the human circulatory system: heart, chamber, atrium (plural: atria) ventricle, valve, lungs, blood vessels: artery, vein, capillary, blood:red/white blood cells platelets, plasma, haemoglobin. Describe the functions of the heart, blood vessels and blood and understand that the circulatory system carries blood to the lungs to pick up oxygen and to get rid of carbon dioxide Understand the role of the skeleton in making blood cells: bone marrow Understand choices that can harm or benefit the circulatory system. ***Y6****: Describe the differences in the life cycles of a mammal, an amphibian (frog—external fertilisation), an insect and a bird and identify internal or external fertilisation.(Living Things and Their Habitats)* Describe the changes as humans develop to old age. *Know the reproductive organs of humans:testes (sperm), ovaries (eggs)* *Describe the development of the embryo: egg, zygote, embryo,*

	habitats) 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 including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Recognise that living things can be grouped in a variety of ways (as above). *Identify that most living things (including plants) live in habitats to which they are suited and on which they depend. (including microhabitats).(Living Things and Their Habitats)* *Using a simple food chain describe how animals obtain their food from plants and other animals . (Living Things and Their Habitats)* **Y2:** Identify that humans and some other animals have skeletons for protection, support and movement. Identify: skull (protects the brain), rib cage (protects heart and lungs),knee cap, spine (back bone),hand, arm, wrist, upper and lower leg bones. Understand that joints are where different bones meet and that	intestine, large intestine, rectum, anus. Identify the different types of teeth in humans and their simple functions. Identify and name parts of the human/animal circulatory system :heart, chest cavity, lungs, blood, blood vessels—arteries, veins. Describe their functions e.g. heart – pump, lungs pick up oxygen, blood vessels transport nutrients and water around the body. *Y4: 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.* *Describe and give reasons for how plants and animals (including micro-organisms) are classified into broad groups, based on observable characteristics - similarities and differences.* Construct and interpret a variety of food chains, identifying producers, consumers (predators ,prey and decomposers). *Identify how sounds are made—association with vibration.* *Recognise that vibration from sounds travel through a medium to the ear.* **Y4**: Understand the basic structure and	*growth in uterus, foetus, newborn. (Living Things and Their Habitats)*

	muscles, attached by tendons to the bone, cause movement at the joint. Describe how muscles cause this movement by contracting (getting shorter) and relaxing. (Covered in more depth in Y4) Describe the functions of the basic parts of the human digestive system. (mouth/teeth/ tongue/ saliva/stomach/intestine/toilet) covered further in Y3. Recognise the impact of diet and on the way their bodies function. Eat Well wheel recognise food groups (review from Y1) and extend by linking to what the food groups are needed for e.g. dairy for proteins for growth and calcium for bones.	function of the human hearing system. *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* **Y4:** Understand the basic structure and function of the human eye. *Use the idea that light travels in straight lines to explain that objects are seen because light travels from light sources to our eyes or from light sources to objects and then to our eyes.* *(light)* **Y4:** Understand that humans and some other animals have bony skeletons/ exoskeletons for protection, support and movement. (Extend work from Y2) Recognise the structure (names of common bones): Use the interaction between bones and muscles to explain how a joint works.	
Teacher Information EYFS: To understand similarities and differences between themselves and others to understand that bthey are unique e.g. physical characteristics – hair colour: differences in likes/dislikes using the senses e.g. taste.	Teacher Information Y1: To understand how the seasons change our environment- light/weather/length of day and how themselves and animals adapt to this. Y1: To understand their bodies and what they can do: senses ,exercise and hygiene.	Teacher Information Y3: To understand the characteristics of an insect/bee, *its life cycle; what bees need to do to survive and what they can do to help.* Y3: To understand what our bodies do with the food we eat: Simple	Teacher Information Y5: To understand what our bodies do with the air we breathe in, through the circulatory system, and how our choices affect how our body works. Y6: *To describe the life cycles of a mammal, amphibian, bird and insect.*

To understand the importance of hygiene e.g. washing hands after going to the toilet, exercise and eating healthy snacks.	Y1: To understand whether animals (pets) stay the same or change – offspring to adults and the basic needs of animals to survive and grow – water, air, food. Right types and amount of nutrition- food groups on the eat well wheel- basic food groups. Y2: To understand how our bodies are made to help us stay alive. How we can move and eat. Recognise the impact of diet and on the way their bodies function. Eat Well wheel recognise food groups (review from Y1) and extend by linking to what the food groups are needed for e.g. dairy for proteins for growth and calcium for bones.	introduction to the digestive and circulatory systems. Y4:*To understand how plants and animals can be grouped/ classified.* Construct and interpret food chains, identifying producers, consumers (predators ,prey and decomposers) Y4: To understand how our bodies are designed to help us see/ linked to light travelling in straight lines/ function of the eye and move: for survival. Y4: To understand how our bodies are designed to help us hear- that sound involves vibration travelling through a medium and how the sound we hear is affected by strength of vibration and distance from the sound source.	To understand the changes as humans age; *know the reproductive organs of humans: testes (sperm), ovaries (eggs) and describe the development of the embryo.*

Plants – Biology

End points for EYFS	End Points for KS1 Y1: Plants Y2: Plants and their Needs	End Points for LKS2 Y3: Plants :Life Cycle Y3: Save Our Bees (Eco-Topic)	End Points for Key Stage Two Y5: Plants and Photosynthesis Y6: Reproduction in Plants
Children can: Make observations of plants and explain why some things occur, and talk about changes.	Children can: **Y1**: Identify and describe the basic structure of a variety of common flowering plants, including trees. Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	Children can: **Y3**: Explore the requirements of plants : nutrients from soil, room to grow and how this varies between plants. (air, light and water covered at KS1). Explain the functions of different parts of flowering plants.(review from Y2	Children can: **Y5:** Classify plants into two main groups understanding the difference between non-vascular (e.g. algae) and vascular plants which have tube-like structures that allow water and dissolved nutrients to move through the plant. Explain the functions of the parts of vascular plants: roots, stems, buds,

	Understand, by looking at evidence, that plants are living things: they grow, need nutrients, move (shoots grow; leaves turn toward the Sun;flowers open and close etc) and reproduce-link with seasons and weather (Living things and Their Habitats) Describe how plants need water, light and a suitable temperature (linked with seasons and weather) to grow and stay healthy. (exploratory unit) Y2: Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers, seeds , bulbs. (simple) Observe and describe how seeds and bulbs grow into mature plants. Explore the requirements of plants : air, light ,water	introduce leaves for photosynthesis) Investigate the ways in which water is transported within plants(water is needed for photosynthesis). Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **<u>Y3:</u>***Recognise the distinguishing characteristics of insects and describe the life cycle of an insect - the bee.* Recognise the role of the bee in pollination understanding that insects can be helpful as well as harmful. *Explain why bees are dying and understand the link between bees and taking care of the Earth. (How to be bee friendly)* *Understand the term <u>global</u> sustainability and how it applies to bees.*	leaves and, xylem and phloem (found in roots, stems and leaves).Xylem—transports water, phloem—transports food/nutrients. Understand that photosynthesis is an important life process by which plant cells make their own food and that animal cells are unable to do this. Describe the structure of a plant cell: cell, membrane,nucleus, nuclear membrane, cytoplasm, cell wall, vacuole, chloroplasts (contain chlorophyll and this is where photosynthesis takes place). Understand the role in photosynthesis of: energy from sunlight, chlorophyll, carbon dioxide, water, oxygen, sugar. **Y6**: Describe the sexual reproduction of flowering plants e.g. peas. Explain the functions of: sepals, petals, stamen (male),anther, pistil (female),ovary or ovule. Understand the process of seed and fruit production: 1.pollen 2. wind, insect and bird pollination 3. fertilisation 4. growth of ovary 5. mature fruit 6.seed dispersal 7. seed germination and plant growth.
Teacher Information EYFS: Develop an understanding of	Teacher Information Y1: To understand that different plants, including trees, grow and change – link	Teacher Information Y3: To understand what plants need to	Teacher Information Y5: To understand what plants do with the water they absorb. Looking

growth and decay- outdoor provision and woodland area of the school grounds. Growing seeds and plants and looking after them. Shows care and concern for plants and the environment. Can talk about plants.	with seasons and the weather, water, light and seasonal temperatures. Identify local plants and trees. Y2: To understand what plants need to stay alive: air, light,water. Describe the functions of different parts of flowering plants and observe how seeds and bulbs grow.	do to survive.: soil types ,room to grow, take up water, make food from photosynthesis and produce seeds for new plants. Y3: To understand the characteristics of an insect/bee, its life cycle;, their role in pollination, what bees need to do to survive and what we can do to help.	in more detail at how water and nutrients are transported around the plant and used in plant cells for photosynthesis. Y6:To understand the sexual reproduction of flowering plants.

Working Scientifically (Working like a Scientist KS1)

End points for EYFS	End Points for KS1 **By the end of KS1, our children will be able to 'work like a scientist' by**	End Points for LKS2 **By the end of LKS2 our children will be able to 'work scientifically' by**	End Points for UKS2 **By the end of KS2 our children will be able to 'work scientifically' by:**
By the end of EYFS, our children will be able to 'work like a Scientist' by: Knowing how to observe closely to identify similarities and differences/changes. Talking about why things happen and how things work. Talking about their Busy Books in relation to Understanding the World e.g. Autumn leaves may have been collected.	**Plan (with support)** Exploring and asking questions. Starting to suggest how to find things out thinking about: -Which enquiry type would work best. -Starting to choose how they would collect and record data from given ideas. -Beginning to select equipment, to test and measure, from a limited range. Making simple predictions.	**Plan (with some support)** Raising relevant questions. Helping to make decisions about : - The appropriate method (enquiry type) to use to answer a question recognising when a fair test is necessary. - Which observations to make and how long to make them for. - How to collect and record data. - Which equipment to use. Making predictions. Talking about criteria for grouping, sorting and classifying . Recognising when and how secondary sources might help me to answer questions that cannot be answered through a practical investigation.	**Plan (independently)** Using their science experience to explore ideas and raise different kinds of questions. Talking about how scientific ideas have developed over time and how evidence has been used to support or refute ideas. Planning an enquiry deciding: -The appropriate method (enquiry type) to use to answer a question: recognising when a fair test is necessary and identifying/ naming independent, dependent and controlled variables . -Which observations to make, how long to make them for and which measurements to use. -How to collect and record data from a choice of familiar approaches. -Which equipment to use. - If repeat readings are necessary: calculating the mean to increase accuracy. Making predictions based on experience

			Researching using secondary sources—recognising which resources will be most useful and separating opinion from fact.
	Do Performing tests and starting to recognise, with support, when a test or comparison is unfair. Observing closely and describing observations using scientific vocabulary. Using and measuring carefully with equipment. Comparing things and sorting and grouping them. Gathering and recording simple data in different ways.	**Do** Setting up practical enquiries, comparative and fair tests. Making systematic and careful observations. Taking accurate measurements using standard units: learning how to use a range of equipment such as data loggers and thermometers. Beginning to look for naturally occurring patterns and relationships. Grouping, sorting and classifying using simple keys. Collecting and recording data from observations/ measurements using scientific language, bar charts, tables, drawings , labelled diagrams, keys.	**Do** Setting up an enquiry recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, *t*aking repeat readings, where appropriate and calculating the mean. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
	Review Saying what my observations show using scientific vocabulary and whether it was what was expected. Beginning to draw simple conclusions. Suggesting improvements to my work.	**Review** Helping to make decisions about how data can be analysed—looking for patterns, relationships, changes, similarities and differences to scientific ideas. Using results/ evidence to draw conclusions and make predictions for new values within or beyond the data I have collected. Reporting on findings using scientific vocabulary , including oral and written explanations, displays or presentations of results and conclusions. Identifying new questions arising from the data and find ways of improving what I have already done.	**Review** Looking for relationships in my data and identify evidence that supports or refutes my predictions. Using test results to make predictions to set up further comparative and fair tests. Evaluating data showing an awareness of potential sources of error and whether an enquiry needs to be repeated. Reporting and presenting findings from enquiries, including conclusions in oral and written forms such as displays and other presentations.