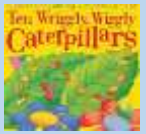
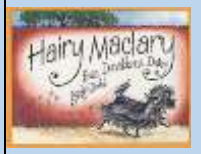
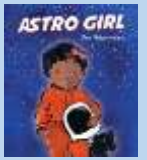
TEACHING SEQUENCE

SCIENCE

	Autumn	Spring	Summer	Curriculum Enhancements
Nursery	**The Natural World** **Plants** Listening walk of awareness around school Planting hyacinth bulbs Review growth of hyacinth bulbs Autumn "Welly Walk" –autumn colours, finds, animals, weather Collect, explore and describe Autumn objects **Vocabulary** Plants, bulb , hyacinth, shoot Seasons; Autumn Weather; cold, hot, rain, wind, cloud, sun, snow, ice	**The Natural World** **Plants** Review growth of bulbs in bug garden Shiny treasure hunt Explore shiny objects, torches, mirrors. **Materials and properties** – sort, describe shiny/non-shiny objects Road safety (high vis jackets and reflective road signs Explore light/dark dens and torches **Living Things** Springtime garden observations and planting in the bug garden Springtime walk of awareness Respect and care for the world we live in Life cycles and new life Observing growth of caterpillars/frog and living things	**The Natural World** **Plants** Observe the growth of cress, beans, potatoes **Living Things** Care for caterpillars **Materials** Discuss and describe different types of buildings and their features, purpose Explore photographs of local area **Vocabulary** Cress, potato, beans, caterpillars material names e.g. plastic, glass, metal	      

		Vocabulary **Plants** senses e.g. touch, feel, see pine cone, leaves, acorn, animal names, hyacinth, bulb, shoot **Seasons**; Autumn **Weather;** cold, hot, rain, wind, cloud, sun, snow, ice **Living things** Mini beast, butterfly, woodlouse, ladybird, cocoon, caterpillar		
Reception	**The Natural World** **Materials** Investigate materials; waterproof / non waterproof What clothes do we wear during different seasons and why?  Use all my senses appropriately to explore different materials, with increased concentration to address curiosity. For Example " sort and categorise a variety of everyday materials, including wood, plastic, glass, metal, water, and rock Describe what they see, hear and feel whilst outside; Observe and identify key characteristics of each season For Example "Begin to recognise and name some familiar plants and animals in their local environment e.g. oak tree, plants, sunflower, robin etc **Vocabulary** **Animals and their habitats;** senses e.g. touch, taste, feel, see, smell, plant and tree parts e.g. seed, plant, petal, stem, roots, leaves, branch, bark.	**The Natural World** Good Health & Well-Being Know and talk about the different factors that support their overall health and wellbeing; **(Get Set 4 PE)** Have made a healthy choice Have eaten a healthy, balanced diet Have been physically active **(Healthy Me -Jigsaw)** **Plants** Planting sunflower seeds, cress and runner beans- looking at life cycles and I can compere living things **(Literacy Tree The Tiny Seed)** What do plants need to grow? How can we care for plants? Where does our food come from? **(Literacy Tree I will not ever never eat a tomato)** To handle, taste and name a range of fruit and veg To know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe	**The Natural World** **Materials** Talk about materials and object that can float or that sink. Investigate through practical activities (The Literacy Tree The Night Pirates) Which materials will float? **Living Things** Investigate different mini beasts and their habitats .Look at life cycles of butterflies Use outdoor bug garden to explore and investigate **Vocabulary** Waterproof, heavy, wet, absorb Mini beast, butterfly, woodlouse, ladybird, cocoon, caterpillar	       **EYFS RRS Links:** **Article 24** – Health, water, food, environment

	Materials; , clear ,rough, smooth, shiny ,bumpy, waterproof, magnetic ,material names e.g. plastic, glass, metal, observe, magnifying glass **Seasons**; Autumn winter spring summer **Weather;** cold, hot, rain, wind, cloud, sun, snow, ice	Look at maps of Great Britain and look how much land we have to grow food and how we need to take care of our land. **<u>Vocabulary</u>** **Science;** Body, human, parts, senses, touch, taste, feel ,healthy, unhealthy, care Apples, carrots, tomato, blueberry, strawberry, satsuma, carrot Flower, stem, leaf, root		
End of phase skills:	**Educational Programmes** **Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.** **ELG** • **I can explore the natural world around me, making observations and drawing pictures of animals and plants** • **I know some similarities and differences between the natural world around me and contrasting environments, drawing on my experiences and what has been read in class** • **I understand some important processes and changes in the natural world around me, including the seasons and changing states of matter**			

Year 1	**Materials** What is a material? What are objects made from? How can I describe a material? Which materials float and sink? Which materials are waterproof? Are some materials magnetic? **Vocabulary:** *material, object, magnetic, absorb, attract, repel, heavy, light, hard, flexible, soft* **Building Things** How can I test which materials are waterproof? What material could I use to build a wall? Can I conduct an experiment? Which materials can withstand strong wind? Can I conduct an experiment? What is a mixture? **Vocabulary:** *brittle, translucent, transparent, opaque, waterproof, shiny smooth*	**Seasons and Weather** What do we know about the weather? How does the weather change across seasons? How do trees change across seasons? How can you measure rainfall? What is hibernation? How can we record wind direction? **Vocabulary:** *spring, summer, autumn, winter, hibernation, weather, forecast, rainy, cloudy, snowy, sunny, rainy* **Sound** What are the 5 senses? How do we hear? How do we look after our ears? How can we describe the pitch of sound? How can we make and describe sounds? **Vocabulary:** *vision, taste, touch, smell, sound, volume, decibels, pitch*	**Plants** How do I plant a bean? What is the difference between deciduous and evergreen trees? What are the parts of trees and plants called? What changes occur to a tomato plant? What changes have occurred to my bean plant? **Vocabulary**: *stem, roots, leaf, flower, sunlight, water, carbon dioxide, temperature* **Living Things** What is a living thing? What is the difference between an invertebrate and a vertebrate? Which animal families are vertebrates? Which animal families are invertebrates? What are the differences between mammals and birds? What types of food do living things eat? **Vocabulary:** *fish, amphibians, reptiles, mammals, birds, insects, crustacean, arachnids*	     **RRS Links:** **Article 24** – Health, water, food, environment

Year 2

Changing Materials

Which material should I use?
How can the shape of solid objects be changed?
Which material is the stretchiest?
Which material is most absorbent?
What is the difference between raw and synthetic materials?
Why do we change materials?

Vocabulary: *absorbent, stretchy, transparent, opaque, waterproof*

Mixing and Making

What are the differences between solids, liquids and gases?
What happens when you heat a solid?
Which mixture makes the best bubbles?
What happens when I mix a solid and liquid together?
How can I separate a mixture?
Are there some changes we can't reverse?

Vocabulary: *solid, liquid, gas, reverse, boiling, freezing, melting*

Light

What is light?
How can we see objects?
What is the difference between light and dark?
Which materials are reflective?
How are shadows formed?
How can you change the size of a shadow?

Vocabulary: *light, dark, shadow, reflection, absorb, light source*

Sound

What is space?
What are the planets in our solar system?
How does the earth orbit and rotate?
What are constellations?
When and how was space discovered?
What kind of scientists study space?

Vocabulary: *Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, solar system, orbit, axis, rotate, satellite, NASA, astronaut*

Habitats

What are the characteristics of living things?
What is a habitat?
What is a microhabitat?
What lives in a desert habitat?
What lives in a rainforest habitat?
Can a city be a habitat?

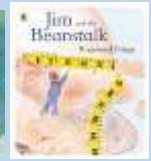
Vocabulary: *movement, respiration, reproduction, nutrition, excretion, growth, habitat, organism,* microhabitat, *food chain*

Human Lifestyle

What are different parts of the human body?
Why is exercise so important?
What is a healthy diet?
How do our bodies change as we get older?
Why is it important to be hygienic?
Whose job is it to keep us healthy?

Vocabulary: *carbohydrates, protein, dairy, fruit and vegetables, fats and sugars, exercise, healthy, hygiene, germs*





RRS Links:
Article 24 – Health, water, food, environment

<table>
<tr><td>End of phase skills:</td><td colspan="4">I can identify and name a variety of common wild and garden plants, including evergreen and deciduous trees
I can identify and describe the basic function of a flowering plant
I can identify and name a variety of common animals
I can identify animals that are carnvores, herbivores and omnivores
I can describe and compare the structure of common animals
I can label the basic parts of a human body and describe the 5 senses
I can describe an object and the material it is made from
I can name a variety of everyday materials
I can describe the simple physical properties of everyday materials
I can compare and group a variety of every day materials
I can describe changes across the 4 seasons
I can describe weather associated with the seasons and change in day length
I can compare the differences between living and dead things
I can identify that most living things live in a habitat to which they are suited
I can name a variety of plants and animals and their habitat, including microhabitats
I can describe how animals obtain their food from plants and other animals using the idea of a simple food chain
I can observe and describe how seeds grow into mature plants
I can describe how plants need water, light and a suitable temperature to grow
I can describe how animals have offspring that grow into adults
I can describe the basic needs of animals, e.g. water, food, air etc.
I can describe the importance of exercise, eating the correct diet etc. for humans
I can identify and compare the suitability of a variety of everyday materials
I can explain how some solids can change shape</td></tr>
<tr><td>Year 3</td><td><u>Practical Skills</u>

What is a variable?
How do you draw a scientific diagram?
Why is a method important?
What can we do with the data we collect?
How can we communicate our results?
How can we record an entire investigation?

Vocabulary: scientific, investigation, practical, variable, independent variable, dependent variable, control variable, fair test, method, diagram, results, conclusion</td><td><u>Sound</u>

What is sound?
How are different sounds produced?
What are frequency and pitch?
What do we mean by amplitude of sound?
How do scientists design objects that use sound?
What are some of the uses of sound?

Vocabulary: frequency, Hertz, amplitude, acoustics, eardrum, hammer, anvil, auditory canal, cochlea, echolocation</td><td><u>Plants</u>

What conditions could we change to investigate the growth of a plant?
What happens to a plant’s growth if we change the conditions it is in?
What are the main parts and functions of a flowering plant?
What are the parts of a plant’s life cycle?
How does a plant transport water?
How do plants adapt to different conditions?
Vocabulary: germination, flowering, pollination, fertilisation, seed dispersal, transpiration, sepals, ovule, ovary, style, stigma, petal filament, anther, stomata</td><td>     </td></tr>
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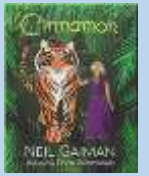
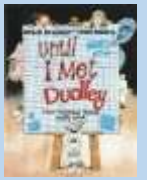
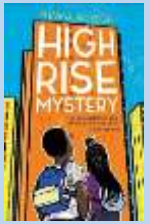
	Raw and Synthetic Materials What is a raw material? What is a synthetic material? How are synthetic materials made from raw materials? How is paper made? What is recycling and why is it important? What does it mean to live sustainably? ***Vocabulary****: material, raw materials, synthetic materials, rubber, wood, cotton, wool, leather, silk, oil, sand, clay, recycle*	**Forces** What are forces? How can we measure the size of forces? What are contact forces? What are noncontact forces? What factors affect an object's ability to float? What impact do gears, levers and pulleys have on forces? ***Vocabulary:*** *force, contact force, non -contact force, up thrust, gravitational force, air resistance, water resistance, friction, magnetic force, lever, pulley, gear*	**Ecosystems** What is an ecosystem? How do we classify the diets of animals? Why are producers so important? How do we construct a food chain? How do we construct a food web? What can cause disruptions to food webs? ***Vocabulary:*** *organism, microorganism, habitat, predator, prey, producer, consumer, photosynthesis, herbivore, carnivore, omnivore*	**RRS Links:** **Article 24** – Health, water, food, environment
Year 4	**Phases of Matter** What are the properties of solids, liquids and gases? How do particles behave inside of solids, liquids and gases? What happens when you heat or cool each state of matter? What are changes of state and why do they take place? How can we measure the melting points and boiling points of a substance? Which substances do not À t into one state of matter? ***Vocabulary:*** *state, phase of matter, solid, liquid, gas, compressible, particles, melt, boil, freeze, condense, heat, cool, temperature, substance, melting point, boiling point, expand, contract*	**Light** What is light and where does it come from? What is reflection and how can we use it? What is refraction and how can we use it? How do we see light? Where do different colours come from? What are some uses of light? ***Vocabulary:*** *energy, sources of light, luminous, darkness, light meter, Lux, transparent, translucent, opaque, reflection, specular reflection, diffuse reflection, refraction, pupil, cornea, lens, retina, optic nerve*	**Adaptations** What is an adaptation? How are organisms adapted to hot environments? How are organisms adapted to cold environments? What adaptations do nocturnal animals have? How are organisms adapted to live underwater? How are organisms adapted to live in the deep sea? ***Vocabulary:*** *organism, habitat, adaptation, camouflage, nocturnal, echolocation, streamlined*	   

	Rock Cycle How is igneous rock formed? How is sedimentary rock formed? How is metamorphic rock formed? How can we identify different rocks? How do rocks on our Earth's surface change? What are the steps in the rock cycle? ***Vocabulary:*** *mineral, rock, magma, organic matter, hard, density, permeable, erosion, sediment, igneous, sedimentary, metamorphic, weathering, physical weathering, chemical weathering, biological weathering, fossilisation*	**Space** What are solar and lunar eclipses? What is the solar system? What do the planets in the solar system differ? What are stars and star constellations? What is the universe and what is it made from? What do astronomers do? ***Vocabulary****: sun, planet, moon, asteroid, meteor, meteorite, comet, astronomy, astrology, universe, galaxy, star, dwarf star, lunar eclipse, solar eclipse, inner rocky planet, outer gas giant*	**Anatomy** What are organs and why do we need them? What are the major bones in the human body? How does human anatomy compare to other animals? Are all teeth the same? How is oxygen transported around our bodies? How do humans digest food? ***Vocabulary:*** *endoskeleton, exoskeleton, organ, peristalsis, red blood cells, white blood cells, , oxygen, carbon dioxide, platelets, plasma, blood vessel* *muscles, brain, skeleton, lungs, liver, kidneys, skin, stomach, small intestine, large intestine*	**RRS Links:** **Article 24** – Health, water, food, environment
End of phase skills:	• **I can ask relevant questions and use different types of enquiry to find the answer** • **I can set up simple practical enquiries, compare and make it a fair test** • **I can make careful observations and record my findings** • **I can gather, record, classify and present data in a variety of ways** • **I can record my findings using drawings, labels, graphs/bar charts etc** • **I can orally discuss my findings and draw conclusions** • **I can identify differences, similarities and change** • **I can identify and describe the functions of parts of flowering plants** • **I can explain the requirements of plants for life and growth** • **I can explain how water is transported within plants** • **I can explain the part that flowers play in the life cycle of flowering plants** • **I can explain that animals, including humans, need the right types of nutrition, and they do not make their own food but get nutrition from what they eat.** • **I know that humans and some animals have skeletons and muscles for support, protection and movement** • **I know that living things can be grouped in a variety of ways**		• **I can compare and group different kinds of rocks on their appearance and properties** • **I can describe how fossils are formed** • **I recognise that soils are made from rocks and matter** • **I can compare and group materials together according to whether they are solids, liquids and gases** • **I know that some materials change state when they are heated and cooled** • **I know the part played by evaporation and condensation in the water cycle** • **I recognise that we need light in order to see things** • **I know that light is reflected from surfaces** • **I recognise that light from the sun can be dangerous and we must protect ourselves** • **I know that shadows are formed when the light source is blocked**	

	• I can explore and use classification keys to help group • I know that environments can change and that this can pose dangers to living things • I know the simple functions of the basic parts of the digestive system • I can identify the different types of teeth and their functions • I can create and interpret a variety of food chains, identifying producers, predators and prey • I know common electrical appliances • I can construct a simple circuit • I know whether a lamp will light in a circuit or not • I know that a switch opens and closes • I know common conductors and insulators	• I can explain how sounds are made • I know that vibrations from sounds travel through a medium to the ear • I can find patterns between the pitch and volume of a sound • I know that sounds get fainter as the distance increases • I know that shadows are formed when the light source is blocked • I know shadows change and can find patterns • I can explain how things move on different surfaces • I know that some forces are contact and non-contact • I know how magnets attract or repel • I can group a variety of everyday materials based on whether they are magnetic or not • I know magnets have 2 poles • I can predict whether magnets will attract or repel

Year 5/6	**Cycle A** **Separating Mixtures** What makes something pure? What makes something a mixture? What is a formulation? How can we separate mixtures into pure substances? How can you separate a mixture of sand, salt and water? How can we separate river water into separate parts? ***Vocabulary:*** *pure substance, mixture, formula, formulation, solute, solvent, solution, soluble, insoluble, filter, alloy* **Physical and Chemical Changes** What happens during a state change? What is a physical change and how can we identify them? What is a chemical change and how can we identify them? How do physical and chemical changes compare? What can we do to investigate chemical reactions? What happens when we place metals into acid? ***Vocabulary:*** *physical change, chemical change, particles, condense, heat, cool, reversible, irreversible, independent variable, control variable, repeatable, reproducible*	**Cycle A** **Magnetism** What are noncontact forces? What are magnets? How does a compass work? How can we see a magnetic field? How can we tell if a material is magnetic or not? What are some uses of magnetic materials? ***Vocabulary:*** *force, contact force, non-contact force, gravitational force, magnetic force, attract, repel, compass, electromagnet, magnetic field* **Electrical Circuits** What is static electricity? What are the parts of an electrical circuit? What are circuit diagrams? What are electrical insulators and conductors? What happens in a circuit when we change the components? How can we create a circuit to build a buzzer game? ***Vocabulary:*** *electricity, static electricity, charge, discharge, circuit, volt, voltmeter, voltage, amp, ammeter, cell, battery, bulb, buzzer, switch, insulator, conductor*	**Cycle A** **Humans and Animals Over Time** What is the theory of evolution? How do fossils provide evidence for evolution? How have different animal kingdoms developed over time? Which types of organism have lived over each era of time? What impact have homo sapiens had on the organisms over time? What is the likely impact of humans on organisms in the future? ***Vocabulary:*** *fossil, fossilisation, sediment, evolution, variation, adaptation, species, Cenozoic Era, Mesozioc Era, Paleozoic Era, Proterzoic Era* **Reproductive Cycle** Why do plants have flowers? How do you clone a potato? How does the lifecycle of an insect compare to an amphibian? Are the life cycles of all mammals the same? Why do birds lay eggs? How do lifecycles compare across the animal kingdom? ***Vocabulary:*** *pollination, fertilisation, sexual reproduction, asexual reproduction, larva, gestation, metamorphosis, embryo, adolescence, germination, flowering*	     RRS Links: **Article 24** – Health, water, food, environment

	Cycle B **Particles and Chemical Reactions** How do particles in solids liquids and gasses behave? What do the particles in pure substances and mixtures look like? What happens to particles during dissolving? How can mixtures be separated? How can we tell when a chemical reaction has taken place? What happens to particles during burning? ***Vocabulary:*** *pure substance, impure substance, depositing, subliming, physical change, chemical change, chemical reaction, precipitate, solute, solvent, solution, soluble* **Sustainability** What are everyday materials made from? Why is recycling important? What is a life cycle assessment? What happens when fuels are burnt? What is global warming? What is climate change? ***Vocabulary:*** *reduce, reuse, recycle, natural resource, global warming, climate change, greenhouse effect*	**Cycle B** **Heat** What happens when you heat particles? Why does heat cause expansion in a substance? What is thermal equilibrium? How is heat transferred between particles? What are thermal conductors and insulators? How can we prevent heat from getting to an ice cube? ***Vocabulary:*** *particle, solid, liquid, gas, heat transfer, thermal equilibrium, heat conduction, conductor, insulator* **Energy** What are energy stores? What is energy transformation? What is efficiency and how can it be calculated? What is power and how does it apply to electrical appliances? How do we relate speed, distance and time? How can we calculate kinetic energy? ***Vocabulary:*** *energy transfer, energy transformation, efficiency, power, gravitational potential energy/ kinetic energy, chemical energy, elastic potential energy, heat energy*	**Cycle B** **Cells** What is the difference between living and non-living things? What are the main organ systems of the body? What are organ systems, organs, tissues and cells? What are animal cells? What are plant cells? What are specialised cells? ***Vocabulary:*** *organ system, tissue, cell, mitochondria, photosynthesis, sperm cell, root hair cell, nucleus, cell membrane, time carbon dioxide, cytoplasm, vacuole, chloroplast, cell wall, digestive system, circulatory system, muscular system, skeletal system, respiratory system* **Diet and Lifestyle** Why do people with different lifestyles need different diets? What effects do different diets have on the environment? What happens to the body during exercise? What are medicinal drugs? What are nicotine and alcohol? How has scientific knowledge improved human health over time? ***Vocabulary:*** *nutrients, nutrition deficiency, circulatory system, drug, medicine, alcohol, nicotine, painkiller, antibiotic, anaesthetic, carbohydrate, antagonistic muscle pair, relax, contract*	

End of phase skills:	• I can plan different types of scientific enquiries to answer questions • I can take measurements, taking repeat readings when appropriate • I can record data and results of increasing complexity • I can use test results to make predictions • I can report and present my findings • I can identify scientific evidence that has been used to support arguments • I can describe the differnces in the life cycles of mammals, amphibians, insects and birds • I can describe the life process of reproduction in some plants and animals • I can describe the changes as humans develop to old age • I can describe how living things are classified into broad groups icnluding micros-organisms, plants and animals • I can explain reasons for slassifying plants and animals • I can identify and name the functions of the human circulatory system • I can recognise the impact of diet, exercise, drugs and lifestyle on my body • I can describe the ways in which nutrients and water are transported within animals, including humans • I know that living things have changed over time and that fossils provide us with information • I know that living things produce offspring of the same kind but are not identical to parent • I know that animals and plans are adapted to suit their environment and that adaptation may lead to evolution • I can associate the brightness of a lamp or volme of a buzzer to the voltage • I can compare and explain variations in how components function • I can recognise symbols when representing a simple circuit in a diagram • I can compare and group materials based on hardness, solubility, transparency, conductivity • I know that some materials will dissolve in liquid to form a solution and know how to recover the substance • I can use knowledge of solids, liquids and gases to decide how mixtures might be separated • I can explain that dissolving, mixing and changes of state are reversible changes • I can explain that some changes result in the formation of new materials and this is not usually reversible • I can describe the movement of the Earth and other planets • I can describe the movement of the moon relative to the Earth • I can describe the sun, Earth and moon as spherical bodies • I can use the Earth's rotation to explain day and night • I can explain that some mechanisms including levers, pulleys and gears allow smaller force to have greater effect • I can explain gravity, air resistance, water resistance and friction • I know that light appears to travel in a straight line • I know that light travel in straight lines because they give out or reflect into the eye • I know that we see things because light travels from light sources to our eyes