Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Assessment	Scheme of work – White Rose Science					
	At the end of each unit of work, children will complete a short White Rose assessment comprising of questions related to the National Curriculum objectives, giving a percentage score. This will inform teacher assessment.					
1	**The Human Body** **Seasonal Changes**	**Materials** **Seasonal Changes**	**Planting A** **Animals**	**Caring for the planet** **Seasonal Changes** **Planting B**	**Plants** **Planting C**	**Growing and Cooking** **Seasonal Changes**
2	**Animals need for survival** **Humans**	**Materials** **Sustainability** - Plastics	**Plants** - Light and Dark	**Living Things and their Habitats**	**Plants** – Bulbs and Seeds **Growing Up**	**Plants** **Sustainability** - Wildlife
3	**Skeletons and movement** **Nutrition and Diet**	**Sustainability** - Food Waste **Rocks**	**Fossils and Soils**	**Light**	**Plants A and B**	**Forces and Magnets** **Sustainability** - Biodiversity
4	**Group and Classify Living Things** **Data Collection**	**States of Matter**	**Sound** **Data Collection**	**Electricity** **Sustainability** - Energy	**Data Collection** **Habitats**	**The Digestive System and Food Chains**
5	**Forces**	**Space** **Sustainability** – Global Warming	**Properties of materials**	**Animals including Humans** **Lifecycles**	**Reproduction**	**Reversible and Irreversible Changes**
6	**Living Things**	**Electricity** **Sustainability** – Renewable Energy	**Light**	**The Circulatory System** **Diet and Lifestyle**	**Adaptations and Variations**	**Fossils and consolidation**

Science Skills Ladder

Key Stage Working Scientifically Objectives	Year	National Curriculum Objectives	Vocabulary	Key Scientist(s) which could be linked.
Children, during all units of work, will engage in the 5 strands of Scientific Enquiry: Comparative Tests; Identify and Classify; Observation over Time; Pattern Seeking; and Research. All lessons will have a focus on working scientifically, with the whole school implementation of '**Floorbooks**' (large, whole class books where investigative and explorative group work is recorded) encouraging this.				
Key Stage 1 **Working scientifically** ✓ asking simple questions and recognising that they can be answered in different ways ✓ observing closely, using simple equipment ✓ performing simple tests ✓ identifying and classifying ✓ using their observations and ideas to suggest answers to questions	**Y1**	**Plants** ✓ identify and name a variety of common wild and garden plants, including deciduous and evergreen trees ✓ identify and describe the basic structure of a variety of common flowering plants, including trees. **Animals, including humans** ✓ identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals ✓ identify and name a variety of common animals that are carnivores, herbivores and omnivores ✓ describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) ✓ identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Leaves, trunk, branch, root, seed, bulb, flower, stem, wild, garden, deciduous, evergreen Amphibians, birds, fish, mammals, reptiles, carnivores, herbivore, omnivore, sight, hearing, touch, taste, smell, head, neck, ear, mouth, shoulder, hand, fingers, leg, foot, thumb, eye, nose, knee, toes, teeth, elbow	**Beatrix Potter** (Author and Botanist) **Chris Packham** (Animal Conservationist)

✓ gathering and recording data to help in answering questions		**Everyday Materials** ✓ distinguish between an object and the material from which it is made ✓ identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock ✓ 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 simple physical properties. **Seasonal Changes** ✓ observe changes across the four seasons ✓ observe and describe weather associated with the seasons and how day length varies.	Hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy/not bendy, waterproof/not waterproof, absorbent, opaque, Seasons, spring, summer, autumn, winter, windy, sunny, overcast, snow, rain, temperature	**William Addis** (Toothbrush Inventor) **Dr Steve Lyons** (Extreme weather) **Holly Green** (Meteorologist)
	Y2	**Living things and their habitats** ✓ explore and compare the differences between things that are living, dead, and things that have never been alive ✓ identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other ✓ identify and name a variety of plants and animals in their habitats, including micro-habitats	Living, dead, never alive, habitats, micro-habitats, food, food chain, leaf litter, shelter, sea shore, woodland, ocean, rainforest, conditions, desert, damp, shade,	**Dr. Wangari Maathai** (Conservationist) **Terry Nutkins** (TV Presenter) **Liz Bonnin** (Conservationist)

		✓ describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. **Plants** ✓ observe and describe how seeds and bulbs grow into mature plants ✓ find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. **Animals (including Humans)** ✓ notice that animals, including humans, have offspring which grow into adults ✓ find out about and describe the basic needs of animals, including humans, for survival (water, food and air) ✓ describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **Uses of Everyday Materials** ✓ identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	Leaves, trunk, branch, root, seed, bulb, flower, stem, wild, garden, deciduous, evergreen, observe, grow, compare, record, temperature, predict, measure, diagram, germinate, warmth, sunlight. Living, dead, never alive, habitats, micro-habitats, food, food chain, leaf litter, shelter, sea shore, woodland, ocean, rainforest, conditions, desert, damp, shade, Waterproof, fabric, rubber, cars, rock, paper, cardboard, wood, metal, plastic, glass, brick, twisting, squashing, bending, matches, cans, spoons,	**Agnes Arber** (Botanist) **Alan Titchmarsh** (Botanist and Gardener) **Steve Irwin** (Crocodile Hunter) **Robert Winston** (Human Scientist) **Joe Wicks** (Personal Trainer) **Charles Mackintosh** (Waterproof coat) **John MacAdam** (roads)

		✓ find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		
Lower Key Stage 2 **Working Scientifically** ✓ asking relevant questions and using different types of scientific enquiries to answer them ✓ setting up simple practical enquiries, comparative and fair tests ✓ making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ✓ gathering, recording, classifying and	**Y3**	**Plants** ✓ identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers ✓ explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant ✓ investigate the way in which water is transported within plants ✓ explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Animals (including Humans)** ✓ identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat ✓ identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Air, light, water, nutrients, soil, support, anchor, reproduction, pollination, dispersal, transportation, flower, energy, growth, seedling, carbon dioxide, oxygen, sugar, material, photosynthesis, chlorophyll Nutrients, nutrition, carbohydrates, protein, fats, vitamins, minerals, water, fibre, skeleton, bones, joints, endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates, muscles, contract, relax	**Jan Ingenhousz** (Photosynthesis) **Joseph Banks** (Botanist) **Adelle Davis** (20th Century Nutritionist) **Marie Curie** (Radiation/ X-Rays)

presenting data in a variety of ways to help in answering questions ✓ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ✓ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ✓ using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ✓ identifying differences, similarities or changes related to simple scientific ideas and processes ✓ using scientific evidence to answer questions or to support findings.		**Rocks** ✓ compare and group together different kinds of rocks on the basis of their appearance and simple physical properties ✓ describe in simple terms how fossils are formed when things that have lived are trapped within rock ✓ recognise that soils are made from rocks and organic matter. **Light** ✓ recognise that they need light in order to see things and that dark is the absence of light ✓ notice that light is reflected from surfaces ✓ recognise that light from the sun can be dangerous and that there are ways to protect their eyes ✓ recognise that shadows are formed when the light from a light source is blocked by a solid object ✓ find patterns in the way that the size of shadows change. **Forces and Magnets** ✓ compare how things move on different surfaces ✓ notice that some forces need contact between two objects, but magnetic forces can act at a distance ✓ observe how magnets attract or repel each other and attract some materials and not others ✓ compare and group together a variety of everyday materials on the basis of whether they are	Rocks, igneous, metamorphic, sedimentary, anthropic, permeable, impermeable, chemical fossil, body fossil, trace fossil, Mary Anning, cast fossil, mould fossil, replacement fossil, extinct, organic matter, top soil, sub soil, base rock. Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent. Force, push, pull, friction, surface, magnet, magnetic, magnetic field, pole, north, south, attract, repel, compass,	**Mary Anning** (Discovery of Fossils) **Inge Lehmann** (Earth's Mantle) **James Clerk Maxwell** (Visible and invisible waves of light) **Willaim Gilbert** (Theories on magnetism) **Andre Marie Ampere** (Founder of electro-magnetism)

		attracted to a magnet, and identify some magnetic materials ✓ describe magnets as having two poles ✓ predict whether two magnets will attract or repel each other, depending on which poles are facing.		
	Y4	**Living Things and Their Habitats** ✓ recognise that living things can be grouped in a variety of ways ✓ explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment ✓ recognise that environments can change and that this can sometimes pose dangers to living things. **Animals (Including Humans)** ✓ describe the simple functions of the basic parts of the digestive system in humans ✓ identify the different types of teeth in humans and their simple functions ✓ construct and interpret a variety of food chains, identifying producers, predators and prey. **States of Matter** ✓ compare and group materials together, according to whether they are solids, liquids or gases ✓ observe that some materials change state when they are heated or cooled, and measure or	Environment, flowering, nonflowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation. Herbivore, Carnivore, Digestive system, tongue, mouth, teeth, oesophagus, stomach, gall bladder, small intestine, pancreas, large intestine, liver, tooth, canine, incisor, molar, premolar, producer, consumer. Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation,	**Cindy Looy** (Environmental change) **Jaques Cousteau** (Marine Biologist) **Ivan Pavlov** (Digestive System Mechanisms) **Joseph Lister** (Discovered antiseptics) **Anders Celcius** (Temperature scale) **Daniel Fahrenheit** (Thermometer)

		research the temperature at which this happens in degrees Celsius (°C) ✓ identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	water vapour, energy, precipitation, collection,	
		Sound ✓ identify how sounds are made, associating some of them with something vibrating ✓ recognise that vibrations from sounds travel through a medium to the ear ✓ find patterns between the pitch of a sound and features of the object that produced it ✓ find patterns between the volume of a sound and the strength of the vibrations that produced it ✓ recognise that sounds get fainter as the distance from the sound source increases.	Amplitude, volume, quiet, loud, ear, pitch, high, low, particles, instruments, wave	**Aristotle** (Sound waves) **Galileo Galilei** (frequency and pitch of sound waves) **Alexander Graham-Bell** (Telephone)
		Electricity ✓ identify common appliances that run on electricity ✓ construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers ✓ identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery ✓ recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit ✓ recognise some common conductors and insulators, and associate metals with being good conductors.	Electricity, electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, conductor, electrical insulator, component.	**Thomas Edison** (First working lightbulb) **Joseph Swan** (Incandescent light bulb)

Upper Key Stage 2 **Working Scientifically** ✓ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary ✓ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate ✓ recording data and results of increasing complexity using scientific diagrams and labels, classification keys,	**Y5**	**Animals (including Humans)** ✓ describe the changes as humans develop to old age. **Living Things and Their Habitats** ✓ describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird ✓ describe the life process of reproduction in some plants and animals. **Properties and Changes of Materials** ✓ compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets ✓ know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution ✓ use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, Hormone, Physical, Emotional, Sexual, Asexual, Pollination, Dispersal, reproduction, cell, fertilisation, pollination, male, female, pregnancy, young, mammal, metamorphosis, amphibian, insect, egg, embryo, bird, plant Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection, Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation,	**David Attenborough** (Naturalist) **James Brodie of Brodie** (Reproduction of plants by spores) **Spencer Silver, Arthur Fry and Alan Amron** (Post-it notes) **Ruth Benerito** (Wrinkle-free cotton)

tables, scatter graphs, bar and line graphs ✓ using test results to make predictions to set up further comparative and fair tests ✓ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations ✓ identifying scientific evidence that has been used to support or refute ideas or arguments.		✓ give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic ✓ demonstrate that dissolving, mixing and changes of state are reversible changes ✓ explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. **Earth and Space** ✓ describe the movement of the Earth, and other planets, relative to the Sun in the solar system ✓ describe the movement of the Moon relative to the Earth ✓ describe the Sun, Earth and Moon as approximately spherical bodies ✓ use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. **Forces** ✓ explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object ✓ identify the effects of air resistance, water resistance and friction, that act between moving surfaces	Dissolving, Mixing Material, conductor, dissolve, insoluble, suspension, chemical, physical, irreversible, solution, reversable, separate, mixture, insulator, transparent, flexible, permeable, soluble, property, magnetic, hard. Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation, waxing, waning, crescent, gibbous. Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar system, day, night, rotate, orbit, axis, spherical, geocentric, heliocentric. Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys, force, push, pull, opposing, streamline, brake, mechanism, lever, cog, machine, pulley	**Maggie Aderin-Pocock** (Space Scientist) **Neil Armstrong, Helen Sharman, Mae Jemison Tim Peake** (Astronauts) **Katherine Johnson** **Galileo Galilei** (gravity and acceleration) **Isaac Newton** (Gravitation) **Archimedes of Syracuse** (Levers) **John Walker** (The match)

		✓ recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.		
	Y6	**Living Things and Their Habitats** ✓ describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals ✓ give reasons for classifying plants and animals based on specific characteristics. **Animals (including Humans)** ✓ identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood ✓ recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function ✓ describe the ways in which nutrients and water are transported within animals, including humans.	Variation Organisms Populations. Classification Characteristics Environment, flowering, nonflowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation. Classify, compare, bacteria, microorganism, organism, invertebrates, vertebrates, Linnaean. Oxygenated, Deoxygenated, Valve, Exercise, Respiration Circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary, digestive, transport, gas exchange, villi, nutrients, water, oxygen, alcohol, drugs, tobacco.	**Carl Linnaeus** (Identifying, naming and classifying organisms) **Sir Richard Doll** (Smoking) **Leonardo Da Vinci** (Anatomy) **Justus von Liebig** (Nutritionist) **Percy Julian** (Pioneering drugs chemist)

		Evolution and Inheritance ✓ recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago ✓ recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents ✓ identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. **Light** ✓ recognise that light appears to travel in straight lines ✓ use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye ✓ explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes ✓ use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **Electricity** ✓ associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit ✓ compare and give reasons for variations in how components function, including the brightness of	Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, Variation, Inherited, Environmental, Mutation, Competition, Survival of the Fittest, Evidence, Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent. Reflect Absorb Emitted Scattered Refraction Electricity, neutrons, protons, electrons, nucleus, atom, electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery	**Charles Darwin and Alfred Russel Wallace** (Theory of Evolution) Jane Goodall (Chimps) **Thomas Young** (Wave theory of light) **Ibn n al-Haytham** (light and our eyes) **Percy Shaw** (Cats' Eyes) **Alessandro Volta** (Electrical Battery)

		bulbs, the loudness of buzzers and the on/off position of switches ✓ use recognised symbols when representing a simple circuit in a diagram.	holder, motor, buzzer, switch, conductor, electrical insulator, conductor.	**Nicola Tesla** (Alternating currents) **Otis Boykin** (Resistors)