Science Knowledge Progression Grid Cycle 1

Year Groups	Working scientifically	Biology	Chemistry	Physics
EYFS	• Make simple observations using appropriate senses. • Test ideas • Make simple comparisons and say what has happened. • Draw simple pictures • Ask basic questions using question words	Animals including humans • Know body parts and senses • Know how a human changes over time • Know about animals on land and animals in the sea • Name some plants and trees in our school area. • Know the basic parts of plants and trees.	Materials-What keeps you dry/war/cool • Know which materials are suited to which use. • Know that objects are made from different materials	Floating and Sinking Pushing and Pulling seasons • Name movements (up and down) • Know some things float and some things sink. • Explain how things move (up, down, fast, slow, push pull) • Know the features of the seasons. • Know that there is a cycle for the seasons.
Year 1 / 2	• Can ask simple questions • Knows how to use simple equipment to make observations • Knows how to carry out a fair test • Knows how to identify and classify • Knows how to explain to others what has been found out. • Know how to use simple data to answer questions	**Animals Including Humans (RSE)** **Name** various parts of the body **Know and identify** a variety of common animals including fish, amphibians, reptiles, birds and mammals **Explain the difference between** a variety of common animals that are carnivores, herbivores and omnivores ● Identify and name a variety of animals including fish, amphibians, reptiles, birds and mammals ● Classify and know animals by what they eat (carnivore, herbivore and omnivore). ● Know how to sort animals into categories (including fish, amphibians, reptiles, birds and mammals, including pets) ● Identify, name, draw and label the basic parts of the human body and say which part	**Everyday Materials** **Name** a variety of everyday materials, including wood, plastic, glass, metal, water, and rock **Know** the simple physical properties of a variety of everyday materials **Explain** and group together a variety of everyday materials on the basis of their simple physical properties ● Distinguish between an object and the material from which it is made. For example: a superheroes cape is made out of fabric.	**Seasonal Changes** **Name** the four season **Know t**he weather associated with the seasons **Explain** how day length varies during the seasons Seasonal changes ● Observe changes across the four seasons. ● Describe and observe how day length varies between seasons. Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Vocabulary: summer, winter, autumn, spring, rain, snow, sun, wind, hail, clouds, heat, warm, cold, cooler, warmer, longer, shorter, lighter,

		of the body is associated with each sense. Vocabulary: head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth **Animals incl. Humans (yr 2)** **Name** the basic needs of animals, including humans, for survival (water, food and air) **Know that animals including humans** have offspring which grow into adults Explain the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. Notice that animals, including humans, have offspring that will 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. **Plants and identification** **Name** a wild plant and a garden plant **Know** a weed is a wild plant that grows in places where people don't want them **Explain** the difference between a deciduous trees and an evergreen tree Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. ● Know and name the petals, stem, leaves and roots of a plant. ● Know and name the roots, trunk, branches and leaves of a tree. Vocabulary: leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem.	● 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 for example whether a superheroes cape is waterproof or not waterproof. ● Compare and group together a variety of everyday materials on the basis of their simple physical properties. Vocabulary: hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/non bendy, waterproof/not waterproof, absorbent/no absorbent, opaque/transparent. (Non-Statutory): Pupils could explore and experiment with a wide variety of materials, not only those listed above, including for example: brick, paper, fabrics, elastic, foil. **Sorting and Using Materials** **Name** 3 different properties of materials including transparent, waterproof and absorbent. **Know** and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses **Explain** how the shapes of solid objects made from some materials can be	

			changed by squashing, bending, twisting and stretching. identify and name a range of materials, including wood, metal, plastic, glass, plastercine, paper and straw. ● Know why a material might or might not be used for a specific job. ● Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	
Year 3/4	• Can ask relevant scientific questions • Can use observations and knowledge to answer scientific questions. • Can set up a test to compare two things • Know how to set up a fair test and explain why it is fair. • Can make careful and accurate observations, including using thermometers and data loggers to make measurements • Can gather, record, classify and present data in different ways to answer scientific questions • Can use diagrams, keys, bar charts and tables to record findings; using scientific language.	**Plants/ Science Week** **Name** the different parts of a flowering part. ie; Stamen, stigma. **Know**- the way in which water is transported within plants **Explain**- the lifecycles of a flowering plant 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 plant life cycle, especially the importance of flowers. Note: Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how it happens. Vocabulary: Movement, respiration, sensitivity, **Animals including Humans** **Name** some of the major bones in a human skeleton- ie skull, pelvis, ribs.	**Rocks** **Name** different kinds of rocks on the basis of their appearance and simple physical properties… sedimentary, ingenious .**Know** that soils are made from rocks and organic matter .**Explain** in simple terms how fossils are formed when things that have lived are trapped within rock Compare and group rocks based on their appearance and simple physical properties. ● Recognise that soils are made from rocks and organic matter. Vocabulary: Sedimentary, metamorphic, igneous	**States of Matter** **1. Name** a solid, liquid and a gas **2. Know** the particle formation in a solid, liquid and gas (solid = tightly packed, liquid=some movement and gas=free movement) **3. Explain** how water changes state according to stages of the water cycle (evaporation, condensation, precipitation and collection) Compare and group materials together, according to whether they are solids, liquids or gases. ● Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius. ● Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature Vocabulary: Solid, liquid, gas, solidify, iron, ice, melt, freeze, liquid, evaporate, condense, cooled, cool, degrees Celsius, thermometer, water cycle, evaporation, condensation, temperature, melting. Note: Teachers should avoid using materials where heating is associated with chemical change,

	• Can use findings to report in different ways, including oral and written explanations, presentations. • Can draw conclusions and suggest improvements • Can identify differences, similarities and changes related to an enquiry • Can use scientific evidence to answer questions and support findings.	**Know** that humans and some other animals have skeletons and muscles for support, protection and movement. **Explain** how muscles and bones work together to help us to move Understand the importance of a nutritious, balanced diet in animals and humans. ● Know how nutrients, water and oxygen are transported within animals and humans. ● Identify that humans and some other animals have skeletons and muscles for support, protection and movement		**Forces and Magnets** **Name** some magnetic and non-magnetic materials **Know** that some forces need contact but magnetic forces do not. **Explain** how friction effects the speed of a moving vehicle according to the surface on which it is travelling (rough and smooth) Compare how objects move on different surfaces. ● Notice that some forces require 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. ● Describe magnets as having two poles. ● Predict whether two magnets will attract or repel each other, depending on which poles are facing **Light** **Name-** different sources of light. **Know**- that darkness is the absence of light. **Explain**-that shadows are formed when a light source is blocked by a solid object. Know what dark is (the absence of light). ● Know that light is needed in order to see. ● Notice that light is reflected from a surface. ● Know and demonstrate how a shadow is formed. ● Explore shadow size and explain the changes. ● Know the danger of direct sunlight and describe how to keep protected.
Year 5/6	● I can plan different types of scientific enquiry to answer questions, including recognising and controlling variables where necessary. ● I can measure accurately and precisely using a range of equipment, with increasing accuracy and precision, taking repeat	Life cycles **Living Things & their Habitats** **Name-** some different habitats and animals/plants that live there. (micro and macro habitats) **Know**- the life processes of reproduction in some plants and animals. **Explain**- the differences in the life cycles of a mammal, amphibian, and bird. Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	**Properties and Changes in Materials** **Name** some materials according to their hardness, solubility, transparency, conductivity and magnetism. **Know** that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution (salt in water)	**Earth And Space** **Name** the planets in our solar system and some characteristics – (Jupiter known as the Giant Planet and Pluto a dwarf planet) **Know** that the earth, sun and moon are spherical and how we know – compare to previous theories – flat earth. **Explain** how the movement of the earth and moon in relation to the sun result in day and night and seasonal change Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.

		readings where appropriate. ● I can record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. ● I can use the outcome of test results to make predictions and set up further comparative and fair tests. ● I can report and present my findings from enquiries in a range of ways. ● I know how to explain a conclusion from an enquiry. ● I can explain causal relationships in an enquiry. ● I know how to relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.	● Describe the life processes of reproduction in some plants and animals. (Non-Statutory) Pupils could find out about the work of naturalists and animal behaviourists such as David Attenborough and Jane Goodall. Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. Vocabulary: life cycles, reproduction, sexual **Animals including Humans (RSE Puberty** **Name-** the changes to human development to old age. **Know**- about the changes experienced in puberty. **Explain**- the difference in gestation periods of some animals compared to humans. Describe the changes as humans develop to old age. Vocabulary: growth, development, puberty, gestation periods. (Non-Statutory) Pupils should learn about the changes experienced during puberty. This is covered as part of our RHE scheme of work.	**Explain** how mixtures might be separated using filtering, sieving and evaporating based on knowledge of properties of state Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. ● Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. ● Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. ● Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. ● 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.	● 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** **Name** some important scientists in the discovery of forces (Sir Issac Newton and Gallileo) **Know** about some forces – friction, gravity, air and water resistance and their effect on other objects **Explain** how levers, pulleys and gears allow a smaller force to have a greater effect. Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. ● Identify the effects of air resistance, water resistance and friction that act between moving surfaces. ● Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.