Hemingbrough Community Primary School
Progression of Skills
SCIENCE: UKS2

Essential Skills for all children every year

- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.
- Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations.
- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.
- High levels of originality, imagination or innovation in the application of skills.
- The ability to undertake practical work in a variety of contexts, including fieldwork.
- A passion for science and its application in past, present and future technologies.

Note: Objectives in *green italics* are opportunities to revise topic when not covered within the year or are topics which are not statutory at that year.

	Y5	Y6	GD/Mastery
SKILLS: Work scientifically This concept involves learning the methodologies of the discipline of science.	To ask questions and answer them by planning fair tests and implementing then.	To ask questions and answer them by planning a range of scientific enquiries using scientific vocabulary and controlling variables where possible.	To confidently answer questions by planning a range of scientific enquiries and use scientific evidence that can be used to support ideas.
	Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables.	Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work. Take measurements, using a range of scientific equipment, with increasing accuracy and precision.	To confidently and independently, use appropriate techniques, apparatus, and materials during fieldwork and laboratory work. Take measurements, using a range of scientific equipment, with accuracy and precision.
	Gather, record, classify and present data in a variety of ways to help in answering questions.	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models.	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models.

	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests.	Present findings in written form, displays and other presentations. Use test results to make predictions to set up further comparative and fair tests.	Use models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments.
KNOWLEDGE: **Understand plants** This concept involves becoming familiar with different types of plants, their structure and reproduction.	*To revise what a range of flowering plants need to grow healthily and describe the functions of different parts: - roots, stem/trunk, leaves and flowers.* *Revise the life cycle of flowering plants, including pollination, seed formation ad seed dispersal.*	To describe the life cycle of a plant, using scientific language and classify plants based on specific characteristics. To know the scientific names of the parts of a plant, their function, how different environments can impact upon them and how plants can adapt. **Explore Vocabulary:** **Petal, stamen, pollination, germination, fertilisation** *Relate knowledge of plants to studies of evolution and inheritance.* *Relate knowledge of plants to studies of all living things.*	To understand what a range of flowering plants need to grow healthily and understand that different and extreme environments can pose dangers or opportunities to living things.
Understand animals and humans This concept involves becoming familiar with different types of animals, humans and the life processes they share.	Describe the changes as humans develop from birth to old age. **Explore Vocabulary:** **Human, development, baby, toddler, child, teenager, adult, puberty, gestation, growing.**	To understand different environments and the habitats that they provide by working scientifically, using classification systems and keys to identify the animals and plants that live there. **Explore vocabulary:** **Organism** **Migration** **Evolution** **Environment** Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the importance of diet, exercise, drugs and lifestyle on the way the human body functions. Describe the ways in which nutrients and water are transported within animals, including humans.	To have a full understanding of different habitats by working and thinking scientifically.

Investigate living things This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes.	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 including sexual and asexual. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow. Explore Vocabulary: Mammal, amphibian, insect, bird, sexual, asexual, rainforest, ocean, desert, prehistoric, similarities, differences	Describe how living things are classified into broad groups according to common observable characteristics. Give reasons for classifying plants and animals based on specific characteristics.	To be able to use scientific language to describe living things confidently and present in various ways.
Understand evolution and inheritance This concept involves understanding that organisms come into existence, adapt, change and evolve and become extinct.		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 Explore Vocabulary: Offspring, inheritance, characteristics, habitat, environment, evolution, natural selection, fossil, inherited traits.	
Investigate materials This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.	Recognise solid, liquids and gases and begin to investigate how some solids will dissolve in liquid. Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, conductivity (electrical and thermal), and response to magnets. Understand how some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.	*Revise being able to recognise solids, liquids and gases and begin to investigate that some solids will dissolve into a liquid and that some mixtures can be reversed.*	Recognise some solids will dissolve in a liquid, that some mixtures can be reversed and separated and know how to reverse the process by a range of methods.

	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, oxidisation and the action of acid on bicarbonate of soda Explore Vocabulary: Properties, solubility, transparency, electrical conductor, thermal conductor, dissolve, solution, separate, evaporation, filtering, sieving, irreversible, magnetism, chemist		
Understand movement, forces and magnets This concept involves understanding what causes motion.	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 effect of drag forces, such as air resistance, water resistance and friction that act between moving surfaces. Describe, in terms of drag forces, why moving objects that are not driven tend to slow down. Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs. Understand that some mechanisms including levers, pulleys and gears, allow a smaller force to have a greater effect. Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.		

	Explore Vocabulary: Gravity, air resistance, water resistance, friction, surface, force, effect, accelerate, change direction, stop, brake, mechanism, pulley, gear, spring, Galileo		
Understand light and seeing This concept involves understanding how light and reflection affect sight.		Understand 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 eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes. 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. Explore Vocabulary: Straight, reflect, reflection, periscope, rainbow, light source, angle of reflection	
Investigate sound and hearing This concept involves understanding how sound is produced, how it travels and how it is heard.	*In music lessons: revise how vibrations in instruments create the sounds.*	*In music lessons: revise how vibrations in instruments create the sounds.* *Discuss how to change the pitch and volume from instruments.*	
Understand electrical circuits This concept involves understanding circuits and their role in electrical applications.	*Revise simple circuits and how switches work.*	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 bulbs, the loudness of buzzers and the on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram. Explore Vocabulary: Voltage, brightness, volume, switches, danger, series circuit, parallel, switch, buzzer, motor	
Understand the Earth's movement in space This concept involves understanding what causes seasonal changes, day and night.	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.	Revise Space when covering light and the speed of light in a vacuum.	

	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. Pupils should find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus. **Explore Vocabulary:** **Earth, Sun, Moon, planets, solar system, Mercury, Venus, Mars, Jupitar, Saturn, Uranus, Neptune, Dwarf plant, Pluto, eclipse, satellite, astronomer, Ptolemy, Alhazen, Copernicus, celestial Body, sundial.**		