Science curriculum map 2019/2020

Scientific Enquiry Skills Milestone 1	Scientific Enquiry Skills Milestone 2	Scientific Enquiry Skills Milestone 3
• Ask simple questions. • Observe closely, using simple equipment. • Perform simple tests. • Identify and classify. • Use observations and ideas to suggest answers to questions. • Gather and record data to help in answering questions.	• Ask relevant questions. • Set up simple, practical enquiries and comparative and fair tests. • Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions • Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables • 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. • Identify differences, similarities or changes related to simple, scientific ideas and processes. • • Use straightforward, scientific evidence to answer questions or to support their findings.	• Plan enquiries, including recognising and controlling variables where necessary • Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models. • Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions. • Present findings in written form, displays and other presentations. • Use test results to make predictions to set up further comparative and fair tests. • • Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments.

	Physics		**Biology**		**Chemistry**	
	Year 3	Year 4	Year 5		Year 6	
Autumn	**Understand light and seeing** This concept involves understanding how light and reflection affect sight. • 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 shadows are formed when the light from a light source is blocked by a solid object. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Find patterns in the way that the size of shadows change **Understand animals and humans** This concept involves becoming familiar with different types of animals, humans and the life processes they share. ***(Prior learning: KS1 Milestone 1)*** • Identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat. • Identify that humans and some animals have skeletons and muscles for support, protection and movement.	**Investigate living things** This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes. ***(Prior learning: KS1 Milestone 1)*** Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys. • Recognise that environments can change and that this can sometimes pose dangers to specific habitats. **Understand animals and humans** This concept involves becoming familiar with different types of animals, humans and the life processes they share. ***(Prior learning: KS1 Milestone 1)*** • 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.	**Investigate materials** This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed. ***(Prior learning: Year 4 Spring Term)*** • 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. • 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.	**Understand light and seeing** This concept involves understanding how light and reflection affect sight. ***(Prior learning: Year 3 Autumn/Summer Term)*** • 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. **Understand electrical circuits** This concept involves understanding circuits and their role in electrical applications. ***(Prior learning: Year 4 Summer Term)*** • 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.
Spring	**Investigate materials** This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed. ***(Prior learning: KS1 Milestone 1)*** • Compare and group together different kinds of rocks on the basis of their simple, physical properties. • Relate the simple physical properties of some rocks to their formation (igneous or sedimentary). • Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. • Recognise that soils are made from rocks and organic matter.	**Investigate sound and hearing** This concept involves understanding how sound is produced, how it travels and how it is heard. • Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear. • (M3) Find patterns between the pitch of a sound and features of the object that produced it. • (M3) Find patterns between the volume of a sound and the strength of the vibrations that produced it. • (M3) Recognise that sounds get fainter as the distance from the sound source increases.	**Understand the Earth's movement in space** This concept involves understanding what causes seasonal changes, day and night. ***(Prior learning: KS1 Milestone 1)*** • 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.	**Understand evolution and inheritance** This concept involves understanding that organisms come into existence, adapt, change and evolve and become extinct ***(Prior learning: Year 3 Summer Term)*** • 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. *Relate knowledge of plants to studies of evolution and inheritance. (NS)* *• Relate knowledge of plants to studies of all living things (NS)* **Investigate living things** This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes. ***(Prior learning: Year 4 Autumn Term)*** • 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. • 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.
Summer	**Understand plants** This concept involves becoming familiar with	**Investigate materials** This concept involves becoming familiar with a range	**Understand movement, forces and magnets** This concept involves understanding what causes motion.	**Understand animals and humans** This concept involves becoming familiar with

	different types of plants, their structure and reproduction.: ***(Prior learning: KS1 Milestone 1)*** • Identify and describe the functions of different parts of flowering plants: roots, stem, 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 role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Understand movement, forces and magnets** This concept involves understanding what causes motion. • 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 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. *Describe the movement of the Earth relative to the Sun in the solar system. (NS)* • *Describe the movement of the Moon relative to the Earth. (NS)*	of materials, their properties, uses and how they may be altered or changed. ***(Prior learning: KS1 Milestone 1)*** • 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 the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **Understand electrical circuits** This concept involves understanding circuits and their role in electrical applications. • 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.	***(Prior learning: Year 3 Summer Term)*** • 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. (NS)* • *Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs. (NS)* • Understand that some mechanisms including levers, pulleys and gears, allow a smaller force to have a greater effect.	different types of animals, humans and the life processes they share ***(Prior learning: Year 3 Autumn Term/Year 4 Autumn Term)*** Describe the changes of the changes as humans develop to old age. • 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 NS – Non-statutory