Name:

Progression of Knowledge and Skills KS2 Science

Notes:

Working scientifically

Year 3	Year 4	Year 5	Year 6
• Asks questions about what they observe • Make observations over a period of time • Use research to find out more • Set up a fair test with different variables • Explain to a partner why a test is a fair one • Measure carefully (taking account of mathematical knowledge up to Year 3) and add to scientific learning • Use a thermometer to measure temperature and know there are two main scales used to measure temperature • Gather and record information using a chart, matrix or tally chart, depending on what is most sensible • Group information according to common factors e.g. plants that grow in woodlands or plants that grow in gardens • Use bar charts and other statistical tables (in line with Year 3 mathematics statistics) to record findings • Know how to use a key to help understand information presented on a chart • Be confident to stand in front of others and explain what has been found out • Present findings using written explanations and include diagrams when needed • Make sense of findings and draw conclusions which help them to understand more about scientific information • Amend predictions according to findings • Be prepared to change ideas as a result of what has been found out during a scientific enquiry	• Asks questions about what they observe • Use research to find out more • Set up a fair test with more than one variable • Explain to others why a test that has been set up is a fair one • Measure carefully (taking account of mathematical knowledge up to Year 4) and add to scientific learning • Use a data logger • Use a thermometer to measure temperature and know there are two main scales used to measure temperature • Gather and record information using a chart, matrix or tally chart, depending on what is most sensible • Group information according to common factors e.g. materials that make good conductors or insulators • Use bar charts and other statistical tables (in line with Year 4 mathematics statistics) to record findings • Present findings using written explanations and include diagrams, when needed • Write up findings using a planning, doing and evaluating process • Make sense of findings and draw conclusions which helps them understand more about the scientific information that has been learned • When making predictions there are plausible reasons as to why they have done so • Amend predictions according to findings • Be prepared to change ideas as a result of what has been found out during a scientific enquiry	• Set up an investigation when it is appropriate • Set up a fair test • Set up an enquiry based investigation • Know what the variables are in a given enquiry and can isolate each one when investigating • Use all measurements as set out in Year 5 mathematics (measurement), including capacity and mass • Use other scientific instruments as needed e.g. thermometer, rain gauge, spring scales • Able to record data and present them in a range of ways including diagrams, labels, classification keys, tables, scatter graphs and bar and line graphs • Make predictions based on information gleaned from investigations • Create new investigations which take account of what has been learned previously • Able to present information related to scientific enquiries in a range of ways including using IT • Use diagrams, as and when necessary, to support writing • Is evaluative when explaining findings from scientific enquiry • Clear about what has been found out from recent enquiry and can relate this to other enquiries, where appropriate • Their explanations set out clearly why something has happened and its possible impact on other things • Able to give an example of something focused on when supporting a scientific theory • Keep an on-going record of new scientific words that they have come across for the first time • Able to relate causal relationships when, for example, studying life cycles • Frequently carry out research when investigating a scientific principle or theory	• Know which type of investigation is needed to suit particular scientific enquiry • Set up a fair test when needed • Know how to set up an enquiry based investigation • Know what the variables are in a given enquiry and can isolate each one when investigating • Justify which variable has been isolated in scientific investigation • Use all measurements as set out in Year 6 mathematics (measurement), including capacity, mass, ratio and proportion • Able to record data and present them in a range of ways including diagrams, labels, classification keys, tables, scatter graphs and bar and line graphs • Make accurate predictions based on information gleaned from their investigations and create new investigations as a result • Able to present information related to scientific enquiries in a range of ways including using IT • Use a range of written methods to report findings, including focusing on the planning, doing and evaluating phases • Clear about what has been found out from their enquiry and can relate this to others in class • Explanations set out clearly why something has happened and its possible impact on other things • support conclusions with evidence • Keep an on-going record of new scientific words that they have come across for the first time and use these regularly in future scientific write ups • Use diagrams, as and when necessary, to support writing and be confident enough to present findings orally in front of the class • Able to give an example of something they have focused on when supporting a scientific theory • Frequently carry out research when investigating a scientific principle or theory

	Year 3	Year 4	Year 5	Year 6
Biology	**Animals including humans** • Know about the importance of a nutritious, balanced diet • Know how nutrients, water and oxygen are transported within animals and humans • Know about the skeletal and muscular system of a human	**Animals including humans** • Identify and name the parts of the human digestive system • Know the functions of the organs in the human digestive system • Identify and know the different types of human teeth • Know the functions of different human teeth	**Animals including humans** • Know the life cycle of different living things e.g. mammal, amphibian, insect and bird • Create a timeline to indicate stages of growth in humans • Know the differences between different life cycles • Know the process of reproduction in animals	**Animals including humans** • Identify and name the main parts of the human circulatory system • Know the function of the heart, blood vessels and blood • Know the impact of diet, exercise, drugs and lifestyle on health • Know the ways in which nutrients and water are transported in animals, including humans

Biology	**Plants** • Know the function of different parts of flowing plants and trees • Know how water is transported within plants • Know the plant life cycle, especially the importance of flowers	**Living things and their habitats** • Use classification keys to group, identify and name living things • Know how changes to an environment could endanger living things • Use and construct food chains to identify producers, predators and prey	**Plants** ▪ Know the process of reproduction in plants	**Living things and their habitats** • Classify living things into broad groups according to observable characteristics and based on similarities and differences • Know how living things have been classified • Give reasons for classifying plants and animals in a specific way **Evolution and inheritance** • Know how the Earth and living things have changed over time • Know how fossils can be used to find out about the past • Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents) • Know how animals and plants are adapted to suit their environment • Link adaptation over time to evolution • Know about evolution and can explain what it is
Physics	**Forces and Magnets** • Know about and describe how objects move on different surfaces • Know how a simple pulley works and use to on to lift an object • 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 • Know about and explain how magnets attract and repel • Predict whether magnets will attract or repel and give a reason	**Electricity** • knows common appliances that require electricity to function • Construct a series circuit • Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers) • Predict and test whether a lamp will light within a circuit • Know the function of a switch • Know the difference between a conductor and an insulator; giving examples of each	**Physics: Earth and space** •Know about and explain the movement of the Earth and other planets relative to the Sun •Know about and explain the movement of the Moon relative to the Earth •Know and demonstrate how night and day are created •Describe the Sun, Earth and Moon (using the term spherical)	**Electricity** • Compare and give reasons for why components work and do not work in a circuit • Draw circuit diagrams using correct symbols • Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer
	Light • Know that dark is the absence of light • Know that light is needed in order to see and is reflected from a surface • Know and demonstrate how a shadow is formed and explain how a shadow changes shape Know about the danger of direct sunlight and describe how to keep protected	**Sound** • Know how sound is made, associating some of them with vibrating • Know how sound travels from a source to our ears • Know the correlation between pitch and the object producing a sound • Know the correlation between the volume of a sound and the strength of the vibrations that produced it • Know what happens to a sound as it travels away from its source	**Physics: Forces** ▪ Know what gravity is and its impact on our lives ▪ Identify and know the effect of air and water resistance ▪ Identify and know the effect of friction ▪ Explain how levers, pulleys and gears allow a smaller force to have a greater effect	**Light** • Know how light travels • Know and demonstrate how we see objects • Know why shadows have the same shape as the object that casts them • Know how simple optical instruments work e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.
Chemistry	**Rocks** • Compare and group rocks based on their appearance and physical properties, giving reasons • Know how soil is made and how fossils are formed • Know about and explain the difference between sedimentary, metamorphic and igneous rock	**States of Matter** • Group materials based on their state of matter (solid, liquid, gas) • Know the temperature at which materials change state • Know about and explore how some materials can change state • Know the part played by evaporation and condensation in the water cycle	**Properties and Changes of Materials** ▪ Compare and group materials based on their properties, e.g. hardness, solubility transparency, conductivity, [electrical & thermal], and response to magnets ▪ Know and demonstrate how some materials can be separated, e.g. through filtering, sieving and evaporating ▪ Know and explain how a material dissolves to form a solution ▪ Know and show how to recover a substance from a solution ▪ Know and demonstrate that some changes are reversible and some are not ▪ Know how some changes result in the formation of a new material and that this is usually irreversible	