Science – Progression in Knowledge, Scientific Enquiry and Vocabulary

Year Three	Autumn One Animals Including Humans Keeping Healthy	Autumn Two Light Light and Shadows	Spring One Rocks Rocks and Fossils	Spring Two Forces and Magnets Amazing Magnets	Summer One Plants Roots and Shoots	Summer Two Plants Artful Flowers, Fruits and Seeds
Key prior knowledge	**Year 2 – Autumn 1 – Healthy Animals**	**EYFS**	**Year 2 – Spring Term - Materials**	**New Unit**	**Year 2 – Summer 2 - Plants**	**Year 3 – Summer 1 - Plants**
Unit Objectives	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	Know that they need light in order to see things and that dark is the absence of light Notice that light is reflected from surfaces Know that light from the sun can be dangerous and that there are ways to protect their eyes Know that shadows are formed when the light from a light source is blocked by an opaque object Find patterns in the way that the size of shadows change	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties ii. describe in simple terms how fossils are formed when things that have lived are trapped within rock iii. recognise that soils are made from rocks and organic matter	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	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
Key enquiries	Session 1 **Food for Thought** Session 2 **A Balanced Diet** Session 3 **Bones and Skeletons** Session 4 **Muscles and Movement** Session 5. **Time to Investigate** Session 6	Session 1 **What is Light?** Session 2 **Reflectors and Lights** Session 3 **Mirror, Mirror!** Session 4 **Shadows** Session 5 **Let's Investigate** Session 6 **What a Performance**	Session 1 **Become Rock Stars!** Session 2 **Rock Detectives** Session 3 **Rock Survey** Session 4 **Fantastic Fossils** Session 5 **Soil Detectives** Session 6	Session 1 **May the Force be with you!** Session 2 **Acting Forces** Session 3 **Magnetic Attraction** Session 4 **Poles Apart** Session 5 **Magnetic Fun Time** Session 6 **All the Fun of the Fair**	Session 1 **Space to Grow** Session 2 **Roots, Shoots and So Much More** Session 3 **Fruit, Shoot, Leaf or Root?** Session 4 **Water for Life** Session 5 **Data, Data, Data!** Session 6	Session 1 **Flower Power** Session 2 **More About Flowers** Session 3 **Seeds in the Making** Session 4 **Explore Fruits** Session 5 **Seed dispersal** Session 6 **What an Exhibition**

	Personal Trainers' Presentations		Make Ready for the Amazing Rock and Fossil Museum!		Space Farm	
Sticky Knowledge	Know that animals, including humans, cannot survive without eating because food provides them with energy for survival and growth in the form of nutrients. Know that animals need a balanced diet of nutrients and therefore of foods containing those nutrients. Know that some animals have skeletons and muscles and understand that these are used for movement, support and protection. Know that different types of animals may have different types of skeleton or no skeleton at all.	Know that we need light in order to see things and that dark is the absence of light. Know that when light hits an object, some of it will be reflected from the surface. Know that shadows are formed when light cannot pass through an object and that an opaque object makes good shadows. Know that the size of a shadow can change depending on the position of the light source or on the distance between the light source and the object Understand that light from the sun is so intense that it can damage our eyes and that we must therefore not look directly at the sun even when wearing dark glasses.	Know that there are different kinds of rocks with different appearances and physical properties. Know that fossils are the remains of things (animals, plants, and other organisms) that once lived on Earth and became preserved in rocks. Know that soil is a mixture of tiny particles of rocks, organic matter from animals and plants, and air and water.	Understand that forces act in particular directions and can make an object start moving, stop moving, change shape or change direction. The greater the force, the greater the movement or change in shape. Know that pushes and pulls are examples of forces. Understand that forces do not always require contact between two objects – for example, magnetic forces can act without direct contact. Know that magnets attract or repel each other, and attract some materials and not others. Know that magnets have two ends (poles) and understand how the poles of two magnets behave towards each other.	Know that the main parts of a flowering plant are the roots, stem, leaves and flowers. Know that these parts are needed for the plant to grow and reproduce and that each has a specific job - roots and stems are needed for nutrition and support, leaves are needed for nutrition, and flowers are needed for reproduction Know that all plants require air, light, water and nutrients (normally from the soil) but that different plants vary in their specific requirements for these resources. Know that plants make their own food, which is a source of energy to grow and reproduce Know that plants transport water from the roots through the stem to all parts of the plant Know that flowers contain the parts needed for the plant to reproduce and that the life cycle includes pollination, seed formation, seed dispersal and germination.	Know that the main parts of a flowering plant are the roots, stem, leaves and flowers. Know that these parts are needed for the plant to grow and reproduce and that each has a specific job - roots and stems are needed for nutrition and support, leaves are needed for nutrition, and flowers are needed for reproduction Know that all plants require air, light, water and nutrients (normally from the soil) but that different plants vary in their specific requirements for these resources. Know that plants make their own food, which is a source of energy to grow and reproduce Know that plants transport water from the roots through the stem to all parts of the plant Know that flowers contain the parts needed for the plant to reproduce and that the life cycle includes pollination, seed formation, seed dispersal and germination.
Scientific Enquiry	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	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	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	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	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	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 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 straightforward scientific evidence to answer questions or to support their findings	equipment, including thermometers and data loggers Gathering, recording, classifying and 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 straightforward scientific evidence to answer questions or to support their findings	equipment, including thermometers and data loggers Gathering, recording, classifying and 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 straightforward scientific evidence to answer questions or to support their findings	equipment, including thermometers and data loggers Gathering, recording, classifying and 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 straightforward scientific evidence to answer questions or to support their findings	equipment, including thermometers and data loggers Gathering, recording, classifying and 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 straightforward scientific evidence to answer questions or to support their findings	equipment, including thermometers and data loggers Gathering, recording, classifying and 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 straightforward scientific evidence to answer questions or to support their findings
Vocabulary	herbivore, carnivore, omnivore, nutrition, diet, food chain, data, table, bar chart, carbohydrates, proteins, dairy, fats, sugars, vitamins, minerals, fibre, growth, repair, health, energy, vertebrate, invertebrate, bone, skeleton, skull, ribcage, pelvis, femur vertebrate, invertebrate, bone, skeleton, skull, ribcage, pelvis, femur lungs, diaphragm, lung capacity, investigate, measure, compare	light, white light, visible light, colour, spectrum, refraction light source, energy, reflector, reflect, predict, investigate, reflective materials reflect, mirror, reflection, image, concave, convex transparent, translucent, opaque, shadow light source, measure	rock, sandstone, limestone, chalk, granite, slate, marble, classification, observation petrologist, man-made rocks, brick, tile, concrete, Igneous, sedimentary, metamorphic, permeable, impermeable, acid, erosion, marble, chalk, limestone, slate, granite, sandstone, identification key survey, petrologist, data, database fossil, ichthyosaur, plesiosaur, ammonite, sediment, minerals, mould, cast soil, micro-organisms, organic matter, particles, sand, silt, fair test, compare, sort, predict	force, push, pull, theory, fair test, investigate, measure gravity, contact, magnet, magnetism, fair test, results, table magnetic, non-magnetic, attract, attraction, theory, repel, repulsion, poles, north, south, time, record, force,	Plants, growth, light, warmth, air, soil, water, investigate, seedlings, research height, root, stem, leaves, flowers, petals, shoots, flowers, petals, buds, fruits, seeds, classify Data logger, light level, temperature, wilting, yellowing, requirement, measure, record yellowing,	botany, botanist, botanical, petals, reproduction, male, female, stigma, style, stamens ovary, carpel, pollination, fertilisation, waggle dance stigma, style, ovules, fruit, pod, seeds Fruit, pod, nut, seed, berry, seed head, Fruit, seed, parent plant, dispersal, germination, investigate, fair test, record, results

Where Next?	**Year 4** Recognise that humans have a digestive system made up of different parts that play a particular role in the digestive process. Recognise that the digestive system in humans is adapted to the food they eat. Recognise that humans have a mix of different types of teeth that are adapted to the food they eat Recognise that food chains show how living organisms depend on other living organisms for survival. Recognise that a food chain is made of a series of plants and animals that eat each other and shows how energy is transferred from one organism to another via food.	**Year 6** Recognise that light appears to travel in straight lines. Understand that we see things because our eyes receive light. Understand that we see most objects because light from a light source travels to the object and then to our eyes, unless it is a light source in which case we see light that travels from it directly to our eyes. Develop a more advanced understanding about reflection and its uses: that we can use mirrors to see round corners; that mirrors reflect an image of any object because light bounces off a mirror in exactly the same pattern as it arrives; that light is reflected by different amounts depending on the roughness and colour of an object (for example, a white object reflects more light than a dark object). Develop a more advanced understanding about shadows: that shadows have the same shape as the objects that cast them because light travels in a straight line; that light passes through some material (transparent) and not others (opaque), and how this affects the ability of an object to form shadows;	**Final Unit** **Next Chemistry Unit – Year 4 – Autumn 2 – States of Matter.**	**Year 5** Understand that forces act in particular directions and can make an object start moving, stop moving, change shape or change direction. The greater the force, the greater the movement or change in shape. Know that pushes and pulls are examples of forces. Understand that gravity is an attractive force between any two objects. Recognise that the effect of Earth's gravity is to make unsupported objects fall down. Understand that air resistance, water resistance and friction act to slow a moving object down. For a falling object, gravity is constant and the time it takes for an object to fall to the ground depends on the resistance the object offers to the air not on the object's mass. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	**Year 3 – Summer 2**	**Final Unit** **Next Biology Unit – Year 4 – Spring 2 – Name that Living Thing!**

		how the size of a shadow changes when the distance from the light source, or between the light source and the object, changes; how the length and position of a shadow depends on the position of the Sun in the sky and that this will change depending on the time of the day and the time of the year. Recognise that when light travels through an object it can bend. This effect, known as refraction, can cause objects to appear distorted, for example, a pen at an angle in a glass of water. Refraction also explains why rainbows happen.				