Science Curriculum Objectives 2022-2023

	R	1	2	3	4	5	6
Working Scientifically		- asking simple questions and recognising that they can be answered in different ways - observing closely, using simple equipment - performing simple tests - identifying and classifying - using their observations and ideas to suggest answers to questions - gathering and recording data to help in answering questions		- asking relevant questions and using different types of scientific enquiries to answer them - 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		- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - using test results to make predictions to set up further comparative and fair tests - reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - identifying scientific evidence that has been used to support or refute ideas or arguments.	
EYFS Framework / National Curriculum Objectives	**<u>The Natural World</u>** - Explore the natural world around them, making observations and drawing pictures of animals and plants; 15 - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. **<u>Past and Present</u>** - Know some similarities and differences between things in the past and now, drawing on their experiences and what has been read in class;	**<u>Plants</u>** - identify and name a variety of common wild and garden plants, including deciduous and evergreen trees -identify and describe the basic structure of a variety of common flowering plants, including trees. **<u>Animals including humans</u>** - identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals - identify and name a variety of common animals that are carnivores, herbivores and omnivores -describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) - identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. **<u>Everyday materials</u>**	**<u>Living things and their habitats</u>** - explore and compare the differences between things that are living, dead, and things that have never been alive -identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other - identify and name a variety of plants and animals in their habitats, including microhabitats - describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. **<u>Plants</u>** -observe and describe how seeds and bulbs grow into mature plants -find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	**<u>Plants</u>** -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, including pollination, seed formation and seed dispersal. **<u>Animals including humans</u>** -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.	**<u>Living things and their habitats</u>** - recognise that living things can be grouped in a variety of ways - explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment - recognise that environments can change and that this can sometimes pose dangers to living things **<u>Animals including humans</u>** - 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. **<u>States of matter</u>** - compare and group materials together, according to whether they are solids, liquids or gases - observe that some materials change state	**<u>Living things and their habitats</u>** - 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 **<u>Animals including humans</u>** - describe the changes as humans develop to old age. **<u>Properties and changes of materials</u>** - 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	**<u>Living things and their habitats</u>** - describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals - give reasons for classifying plants and animals based on specific characteristics. **<u>Animals including humans</u>** - identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood - recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function - describe the ways in which nutrients and water are transported within animals, including humans. **<u>Evolutions and inheritance</u>** - recognise that living things have changed over time and that fossils provide information about living things that inhabited

		-distinguish between an object and the material from which it is made - 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 - Compare and group together a variety of everyday materials on the basis of their simple physical properties. **Seasonal changes** - observe changes across the four seasons -observe and describe weather associated with the seasons and how day length varies.	**Animals, including humans** -notice that animals, including humans, have offspring which 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. **Uses of everyday materials** - identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses -find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	**Rocks** -compare and group together different kinds of rocks on the basis of their appearance and simple physical properties -describe in simple terms how fossils are formed when things that have lived are trapped within rock - recognise that soils are made from rocks and organic matter. **Light** -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 light from the sun can be dangerous and that there are ways to protect their eyes -recognise 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 **Forces and magnets** - 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	when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) - identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **Sound** - identify how sounds are made, associating some of them with something vibrating - recognise that vibrations from sounds travel through a medium to the ear - find patterns between the pitch of a sound and features of the object that produced it - find patterns between the volume of a sound and the strength of the vibrations that produced it - recognise that sounds get fainter as the distance from the sound source increases. **Electricity** - 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.	- 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. **Earth and space** - 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. **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 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.	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. **Light** - recognise 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 eye - 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 - use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **Electricity** - 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

Redwell Science LTP 2022-2023

Skills Matrix (Progression of Skills)

Year Group		1	2	3	4	5	6
Learning Objectives from Engaging Science Scheme	Knowledge Biology Chemistry Physics	**The Animal Kingdom (Animals including humans)** Name the parts of the external human body (head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth lips etc.) Describe what we use these body parts for or what they do Discuss some basic ways of staying healthy – eating well, exercising, keeping clean Know the basic animal classes of birds, fish, amphibians, reptiles, mammals and invertebrates Know the basic animal classes of birds, fish, amphibians, reptiles, mammals and invertebrates Name the main body parts that characterise of different animal classes Describe the diet of some of the common British animals they have been studying Use the research from the previous week to contribute a report to a class book or blog about animals **Everyday materials** begin to name common materials and describe their properties. distinguish between an object and the material it is made from. know that materials can be used in a variety of ways know that materials can be sorted in a variety of ways according to their properties know that materials are chosen for specific purposes on the basis of their properties know that there is a range of materials with different characteristics develop the vocabulary needed to describe material properties	**Living things (Living things and their habitats)** understand that plants are living things know some of the characteristics of living things –movement, growth, excretion, reproduction, sensitivity know that all living things have certain needs understand that plants are living things know that plants are alive describe the differences between animals and plants **Animals and their needs (animals including humans)** know that animals grow in different ways know that mammals have live young but other animals do not describe how humans grow describe the basic needs of animals – food, air, warmth state some ways in which humans stay healthy know that eating a good diet is helps us stay healthy know that foods can be sorted into groups state the basic foods that are needed for a healthy diet and those foods that should be eaten in moderation Know how humans stay healthy – hygiene, exercise and rest observe the difference in growth of the animals since the previous week **Plants (Plants)** give a basic explanation of what a seed is know that plants have stem, leaves, roots (recap of Year 1) know that plants lose water from their leaves know that bulbs and seeds differ in structure and formation	**Animals and skeletons (animals including humans)** Know that animals need to eat because they do not make their own food as plants do. Understand and use the terms variable and value Know that the digested food is used for energy, to help us grow and to repair the body Know that different kinds of food are used for different things: protein for growth and repair, fat and carbohydrate for energy Come to a conclusion about the diet of an owl as a result of their findings Know that some animals have skeletons inside their bodies and others, such as insects and crustaceans, have a skeleton outside their bodies Note some differences in movement between animals with a skeleton and animals without a skeleton Know the main parts of the body associated with the muscular and skeletal system Know that different parts of the muscular-skeletal system have different functions Know that muscles are attached to the skeleton and help us move **Forces and Magnets (Forces and magnets)** Identify forces as pushes, pulls or twists Know that a force can change the speed, direction or shape of an object Know that force is measured using a force meter and that the units of measurement are Newtons. Recognise that many forces require a contact between them for the force to take effect	**Classification (Living things and their habitats)** Describe the main events in the life of Carl Linnaeus Describe the contribution Carl Linnaeus made to our understanding of classification Understand how keys are constructed Describe the classification of vertebrates into fish, amphibians, reptiles, birds, and mammals Describe the classification of invertebrates into snails/slugs, worms, insects, crabs and spiders Recognise that some flowers such as grasses and some tree flowers do not have petals Describe the classification of plants into flowering plants (including grasses) and non-flowering plants such as ferns and mosses Identify, using support materials where necessary, the common animals and plants in the local area **Digestion (Animals including humans)** Describe the human teeth and their positions in the mouth Name the different sorts of teeth found in humans Know that children have milk teeth that are lost as adult teeth develop Understand the need to take care of your teeth and how to do this Describe the differences in teeth that have been cared for and those that have not Know that the tongue is the organ for taste and that it helps to move food into the oesophagus Name the different parts of the digestive system Outline the basic function of each part of the digestive system	**Decay and Recycling** Know that some things decay and others do not Know that some living things are decomposers Know that some materials can be recycled Describe the process of decay and its usefulness Know that some materials can be recycled into useful new materials Describe some of the factors that will accelerate or slow down decay Consider some of the ethical and financial aspects of recycling and waste **Life Cycles (living things and their habitats)** Recognise that flowering plants produce seeds from their flowers which grow into new plants Describe the life cycle of flowering plants including pollination, fertilisation, seed production, seed dispersal and germination Describe the structure of a flower, naming the main parts of the flower Describe different ways of growing new plants other than using seeds Know the difference between asexual and sexual reproduction in plants Know that all animals have a life cycle that includes being born, developing into an adult, reproducing, and eventually dying Know that life cycles vary from one class to another Know that insects and amphibians undergo metamorphosis **Earth and Space** Describe the relative motion of the Earth, the Moon and the Sun State the difference between a sun, a planet and a moon	**Heart and Lungs (Animals including humans)** Describe the functions of blood, including clotting Know that blood is pumped round the body by the heart that there are different groups of human blood Describe the basic structure of the circulatory system Explain the functions of the heart, arteries veins and capillaries Describe the structure of the heart Explain the basic function of the heart Describe the structure of the lungs and the basic functions of the lungs Describe how the heart and lungs work together to keep us alive Know that the heart rate can be determined by taking a pulse, and where pulse points are found Relate these changes to the need for more oxygen and energy in the muscles Know that alcohol, smoking and the use of some drugs can harm the body Describe some of the short term and long term effects of alcohol, smoking and drugs **Classification (living things and their habitats)** Name the five kingdoms of living things Describe the characteristics of different vertebrate and invertebrate groups Understand that there is a great variety of living things Understand the term biodiversity Know about some of the threats to biodiversity, including the threats posed by humans Know that micro-organisms living things that are often too small to be seen with the naked eye

	Knowledge **Biology** **Chemistry** **Physics**	know that objects made from elastic or malleable materials can be altered by squashing, bending, twisting and stretching know that transparent objects let the light through but opaque objects do not **Plants (Plants)** know what a seed is and how to plant it know what a bulb is and how to plant it know what plants and seeds need to grow and how to take care of plants name the basic parts of a plant: stem, leaves, roots, flower, petals, fruit, bulb and seed know that bulbs grow into new plants distinguish between trees and other flowering plants know the main parts of a tree: trunk, roots, branches, leaves, fruit know that some trees are evergreen and do not lose their leaves in winter but others are deciduous and do identify trees as deciduous and evergreen name some common native trees know that some plants produce flowers which develop into seeds know that the fruit produced by trees contains its seeds discuss the idea of a "weed" **The weather (Seasonal Changes)** Describe the changes in the weather with the seasons Provide a fictional weather forecast for a month of the year Learn how to stay safe in the sun. Learn about the effects of the Sun in the UK and around the world Know that rain comes from clouds Know that not all clouds produce rain and that there are different kinds of clouds Look at different types of storm around the World – hurricanes, tornados, monsoons Know that some storms in the UK are accompanied by thunder and lightning Know that snow comes from clouds Know that some parts of the	know that plants provide humans and other animals with food identify the parts of the plant that are consumed for a range of vegetables describe how plants change through the seasons know that some plants are perennial and some are annual or biennial describe the difference between perennial plants and annual plants know, through investigation, that seeds and bulbs need water and warmth but not light to grow know that growing plants need light to stay healthy **Materials (Everyday materials)** revise work on materials from Year 1 list the uses of a particular material in and around school recognise that some materials are naturally occurring and some are not name some naturally occurring materials describe in simple terms how and why the use of materials has changed know the contribution made to materials science by John Boyd Dunlop **Habitats (Living things and their habitats)** learn the term habitat and micro-habitat give examples of different habitats describe a woodland habitat describe the kind of microhabitats found in woodland know some of the common woodland animals and plants describe a seashore habitat describe the kind of microhabitats found in the seashore know some of the common seashore animals and plants know that living things should be treated with respect identify some animals and plants living in and around ponds know that plants do not need to eat because they make their own food know that some animals are carnivores, some are herbivores	Know that friction is a force between two surfaces that slows objects down Describe some factors that affect friction Describe what a magnet is Know that magnets can exert forces at a distance Know that magnets have two ends called poles that attract or repel each other depending on how they are arranged Describe some everyday uses for magnets Describe some uses of magnets Summarise their learning about magnetism **Plants (plants)** use their knowledge of plants to plan and set up an investigation into plant growth set up a simple experiment take careful measurements and make systematic observations describe the structure of a flowering plant explain that water moves from the roots through branches and stems to leaves and flowers describe some methods of seed dispersal explain why seeds need to be dispersed describe the life cycle of a flowering plant describe the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal generate oral and written reports on the findings of their investigation explain that plants do not need to eat food because they make their own describe why plants need water, light, space and nutrients for growth **Light (Light)** know that some objects produce light energy and that these are light sources know that some surfaces reflect light distinguish between light sources and objects that reflect light know that the Sun is a light source but the Moon is not know that some surfaces reflect light know which surfaces have the	Know that all food chains start with plants that create their own food using energy from the Sun Know that some animals are predators and some are prey, Understand food chains and use them to describe feeding relationships Identify animals that are predators, those that are prey and those that are both **Electricity** Identify that a number of common appliances and pieces of equipment use electricity Know that some appliances use mains electricity and some use batteries Know the dangers of mains electricity and how to avoid them Understand that a flow of electricity (electric current) is only possible when there is a complete loop of conducting material Know that some materials let electricity flow through them and others do not Recognise that all metals are conductors and most non-metals are insulators Know that air is an insulator Describe the purpose of different components in a circuit components, including switches and buzzers Describe the relationship between the numbers of batteries, the numbers of bulbs and the brightness of bulbs Know that too much current will cause the bulb to blow **Sound** Associate sound with vibrating objects Describe a range of ways of getting things to vibrate Describe how the shape of our ears helps us hear Describe the basic structure of the ear Establish that sounds get fainter as the distance increases Know that sound travels through solids and liquids as well as air Associate loudness with stronger vibrations understand what pitch is describe some ways of changing the pitch of a vibrating object	Know that the Sun, planets and moons in the solar system are approximately spherical in shape Explain how ideas about the solar system have changes through the centuries Identify the eight planets within the solar system and their positions relative to the Sun Compare planets in terms of atmosphere, time to orbit the Earth, period of rotation, number of moons etc Explain night and day in terms of the rotation of the Earth Describe and explain in simple terms how the appearance of the Moon in the sky changes over the course of 28 days **Mixtures and Reactions (Properties and changes of materials** Extend their knowledge of properties to include more abstract properties such as hardness, thermal and electrical conductivity, magnetic attraction Know that metals have similar, specific properties Know that some materials dissolve in water and others do not and give examples of both Know that a substance is still present in the solution when it has dissolved Describe ways in which dissolved substances can be recovered from solution Understand that melting and dissolving are different processes Know that burning results in the formation of new materials including gases that we cannot see Know that chemical changes are usually not reversible Identify hazards associated with burning materials Recognise that chemical reactions form new substances and that this kind of change is not usually reversible Know how post-its and/or wrinkle-free cotton were developed **Human Development (animals including humans)** Describe the basic changes as humans develop from birth to old age	Know that whilst some micro-organisms bring about disease many others are useful State some of the uses for yeast **Electricity** Know how to stay safe when working with electricity Describe the use of different components within a circuit: cells, wire, switch, buzzer, bulb, motor Represent and reproduce simple circuits in diagrams using recognised symbols Describe the differences between series and parallel circuits Design and build a game that involves an electric circuit **Evolution (Evolution and inheritance)** Describe the contribution he made to scientific knowledge about evolution Understand the term evolution Describe ways in which animals are adapted to avoid predation, for example camouflage, use of warning colours in insects, spines on plants explain how fossils provide evidence for evolution explain how humans have evolved **Light** describe and give examples of light sources state some basic properties of light know that light travels in straight lines Know that many objects reflect light 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 Know the basic structure of the eye

	Knowledge **Biology** **Chemistry** **Physics**	world and some seasons are more likely to have snow	and some are omnivores understand the term food chain and cite some simple examples of food chains	best reflective properties know that the eyes are the organs of sight recognise that they need light in order to see things and that dark is the absence of light know how to protect their eyesight, including protection from sun damage know that some substances allow light to pass through completely or partially and use the terms transparent, translucent and opaque know how shadows are formed know what determines the length of shadows **Rocks (Rocks)** examine and describe different specimens of rock name some of the most common rocks describe in simple terms how igneous, sedimentary and metamorphic rocks are formed describe how fossils are made explain how the fossil record helps us learn about life millions of years ago	**States of Matter** Identify materials as solids, liquids or gases Describe the properties of solids, liquids and gases Know that solids consisting of very small pieces (e.g. sand) behave like liquids in some ways Know that there are gases all around us but they are invisible State the properties of gases Know how to use a thermometer Know that the same material can exist as both solid and liquid Name the changes of state Describe the water cycle in terms of changes of state **Respecting our Environment** Know that humans can have an effect on the environment Use everyday terms to describe simple features living things or events they observe Identify where humans have had an impact on an environment Identify ways that humans can damage an environment Identify ways in which humans can protect and improve environments Describe examples of the impact of humans on their environment Discuss some moral and social aspects of the impact of humans on their environment Use scientific forms of language when communicating simple scientific ideas, processes or phenomena	Describe the changes that happen during puberty Describe the development of a baby Know how babies are born **Forces** Know that the Earth and objects are pulled towards each other; this gravitational attraction causes objects to have weight Know that weight is a force and is measured in Newtons and that mass is the amount of matter and is measured in kilograms Know that air resistance slows moving objects Know that when an object falls, air resistance acts in the opposite direction to the weight Know that when an object is submerged in water, the water provides an upward force (upthrust) on it Know that things will float if the upthrust is greater than the weight Know that water resistance acts to slow down objects that are moving through the water Compare air and water resistance Know that the force between two moving surfaces in contact is called friction Know that friction can be useful or a problem and provide examples of both Describe how simple machines such as gears, levers and pulleys are used to transfer forces or to change speed or direction	

	Skills **Working Scientifically** **Biology** **Chemistry** **Physics**	**Yr 1 The Animal Kingdom (Animals including humans)** Sort and group different kinds of animals Compare the diet of these animals with the human diet Use a number of sources to find out about a common animal Make notes in order to include relevant key facts in a report about an animal **Yr 1 Everyday materials (Everday Materials)** make and record observations about materials group materials together and make a record of groupings explore materials using appropriate senses, making observations and simple comparisons carry out simple tests use their observations and ideas to suggest answers to questions gather and record data to help in answering questions. present the data in a suitable manner provide a simple conclusion that answers the question **Yr 1 Plants (Plants)** sort and group a variety of objects into seeds and non-seeds monitor the growth of seeds and bulbs planted last weeks ago monitor the growth of seeds and bulbs planted two weeks ago monitor the growth of seeds and bulbs planted three weeks ago monitor the growth of seeds and bulbs planted four weeks ago compare a wild area and a garden make observations monitor the growth of seeds and bulbs planted five weeks ago use observations notes and charts to describe the growth of seeds/bulb **Yr 1 The weather (Seasonal Changes)** Make and use simple instruments for observing the weather, setting up a simple weather station Take measurements from the weather station and observe the weather outside Take measurements from the weather station and observe the weather outside Make a rainbow Take measurements from the weather station and observe the weather outside Take measurements from the weather station and observe the weather outside	Y4 **Classification (Living things and their habitats)** Use a key to identify an unknown plant or animal Create a key to identify a number of plants or animals Identify the characteristics of each class Correctly place unfamiliar vertebrates into one of these classes Identify the characteristics of each class Correctly place unfamiliar invertebrates into one of these classes Identify the characteristics of each class Correctly place unfamiliar plants into one of these classes Recognise that these animals and plants vary widely but that they can be sorted into different groups Recognise that environments can change and that this can sometimes pose dangers to living things. Y4 **Digestion (Animals including humans)** Create a model of a digestive system Identify in the model each part of the digestive system and describe its basic function Link the use of the terms predator and prey to the terms herbivore, omnivore and carnivore Construct a food web to show more complex feeding relationships Y4 **Electricity** Associate the use of batteries with the need for less power Construct a simple circuit involving batteries Relate some incidents in the history of electricity (using secondary sources) Investigate the effect of changing components in a series circuit Make systematic and careful observations Using their knowledge of electricity, construct and test a burglar alarm for a house Y4 **Sound** Create sounds in a variety of ways Use their ears to listen to and identify sounds Investigate the effectiveness of different materials to muffle sound Use their knowledge of how sound is made to make and play a musical instrument Y4 **States of Matter** Begin to assign properties to different states of matter Set up simple comparative and fair tests to establish the factors that affect evaporation Record findings using simple scientific language, bar charts and/or tables Use results to draw simple conclusions Y4 **Respecting our Environment** Present evidence they have collected in simple Communicate simple features or components of living things or events they have observed in appropriate forms Present their ideas and evidence in appropriate ways Use simple scientific vocabulary to describe their ideas and observations	Y6 **Classification (living things and their habitats)** Create a key to identify microorganism classes Observe the growth of yeast and the waste products of yeast Investigate the things yeast needs to grow Y6 **Heart and Lungs (Animals including humans)** Record data and results using tables and line graphs Report and present findings from enquiries Through investigation, describe the changes that take place in pulse rate and breathing rate before, during and after exercise Y6 **Electricity** Construct simple series circuits and identify the uses of different components Examine an unfamiliar diagram of a simple circuit and explain how they know whether it will work when constructed Investigate how differences in voltage affect the performance of components within a circuit Plan and carry out an investigation, ensuring a fair test Make accurate measurements and draw conclusions based on results Plan an investigation, recognising and controlling variables where necessary Take measurements, using a range of scientific equipment, with accuracy and precision, repeating readings when appropriate Record data and results of increasing using circuit diagrams, tables and line graphs Draw conclusion and explain the degree of trust in results Build simple series and parallel circuits to solve problems Design and build a game that involves an electric circuit Evaluate the game Y6 **Evolution (Evolution and inheritance)** Research and recount the main events in the life of Charles Darwin Explore the reasons that some people do not believe that evolution happened and look at some creation stories from different religions, e.g. the Vikings Research the ways in which animals and plants are adapted to their environment Model evolution through the use of games/simulations Model and compare evolution and selective breeding Y6 **Field Studies** Use sampling techniques to record numbers of species Make simple comparisons of the same habitat throughout the year Use and evaluate some sampling techniques for environmental field work Compare populations of living things during the course of the year Provide reasons for the changes in population during the year Describe the strengths and weaknesses of different sampling techniques Explain differences in populations during the year Provide reasons for the differences observed and measured in different areas Y6 **Light** investigate changes in shadows depending on the relative positions of the light source and object and the use of filters plan an investigation, recognising and controlling variables take measurements with accuracy and precision, repeating readings when appropriate record results using scientific diagrams, tables, and graphs Establish the best arrangement of light source and position of object in a shadow puppet theatre

	Skills **Working Scientifically** **Biology** **Chemistry** **Physics**	**Yr 2 Living things (Living things and their habitats)** classify items as living things, things that were alive and things that have never been alive **Yr 2 Animals and their needs (animals including humans)** take a first look at animals to be observed (tadpoles, chicks, butterfly etc.) observe the difference in growth of the animals since the previous week observe the difference in growth of the animals since the previous week design a healthy diet observe the difference in growth of the animals since the previous week Collate observations of animals into a single document to describe the growth of the animals in the study **Yr 2 Plants (Plants)** distinguish between seeds and other similar materials predict whether plants need water, warmth and/or light to grow make appropriate measurements and observations of plant growth make measurements and record observations of the growth of seeds and bulbs to draw conclusions from a range of experiments about what plants need for growth **Yr 2 Materials (Everyday materials)** find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. compare and contrast the advantages of using different materials for the same object compare the range and use of materials in a different time period with their use nowadays ask simple questions and recognise that they can be answered in different ways performing simple tests gather and record data to help in answering questions. Plan an investigation into material properties investigate the best paper for a food bag **Yr 2 Habitats (Living things and their habitats)** explore a pond habitat	**Yr 3 Animals and skeletons (animals including humans)** Using research methods, identify the diets of a number of animals including birds Classify animals as omnivores, herbivores and carnivores Develop a classification system for foods Investigate an owl pellet, making notes and observations Classify animals as vertebrates or invertebrates **Yr 3 Forces and Magnets (Forces and magnets)** Provide examples of useful and non-useful friction in everyday life Classify materials as magnetic or non-magnetic Determine a general rule for predicting which materials are magnetic Investigate the relationship between the size of a magnet and its strength **Yr 3 Plants (plants)** recording findings using simple scientific language and measurements observe the movement of food dye through a flower use results to draw simple conclusions, suggest improvements and raise further questions use straightforward scientific evidence to support their findings **Yr 3 Light (Light)** set up a simple comparative and fair test make measurements using data loggers record findings using simple scientific language, bar charts, and tables reporting on findings and draw conclusions **Yr 3 Rocks (Rocks)** classify rocks according to their own criteria investigate the properties of igneous and sedimentary rocks carry out simple tests on rocks, recording results and drawing conclusions investigate the composition of soil use the investigation to come up with a model of how soil is formed use fossil pictures to draw conclusions about dinosaurs	Y5 **Decay and Recycling** Plan a scientific enquiry with help Observe closely, recording findings Identify materials that will decay Plan a scientific enquiry to find decay times of common materials, recognising and controlling variables Record findings and estimate degree of trust in results From investigation, estimate the time needed for some common materials from litter to decay Plan a scientific, recognising dependent, independent and control variables Select appropriate methods for presenting data Present reasoned, well evidenced conclusions Y5 **Life Cycles (living things and their habitats)** Make observations of plant and animal life cycles Compare the production of new plants through the planting of seeds and the taking of cuttings Research the life cycle of an unfamiliar bird and an unfamiliar mammal Describe the changes that occur during the growth and development of insects and amphibians Compare the life cycles of an insect and an amphibian in simple terms Y5 **Earth and Space** Investigate differences in the time of day and the length of day in different parts of the World Investigate factors that affect the formation of craters, taking measurements with increasing accuracy and precision, taking repeat readings when appropriate Y5 **Mixtures and Reactions (Properties and changes of materials** Match material properties to their use Separate solute from a solution by crystallisation Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering and sieving Plan an investigation to determine ways in which solids can be removed from liquids Report the findings from their investigation into treating sewage including conclusions and explanations of their findings Identify some changes as irreversible and explain reasons for doing so Identify substances through their chemical and physical changes Y5 **Human Development (animals including humans)** Compare the human life cycle to the life cycle of other animals Y5 **Forces** Be able to use a force meter carefully, interpreting the scale correctly Investigate a range of simple machines: pulleys, gears, ramps, wheel and axle and levers Build a catapult and describe how it works, identifying any simple machines in its construction Evaluate the catapult they have built

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Key Stage		Key Stage One		Key Stage Two			
Year Group		1	2	3	4	5	6
Autumn 1	Topic	My 5 Senses	Pirates	India	Africa	Macbeth	Woeful Wars
	Science Focus	The Animal kingdom	Materials	Light	States of Matter	Mixtures and reactions	Heart and lungs
	Knowledge & Understanding Biology Chemistry Physics	**The Animal Kingdom (Animals including humans)** Name the parts of the external human body (head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth lips etc.) Describe what we use these body parts for or what they do Discuss some basic ways of staying healthy – eating well, exercising, keeping clean Know the basic animal classes of birds, fish, amphibians, reptiles, mammals and invertebrates Know the basic animal classes of birds, fish, amphibians, reptiles, mammals and invertebrates Name the main body parts that characterise of different animal classes Describe the diet of some of the common British animals they have been studying Use the research from the previous week to contribute a report to a class book or blog about animals	**Materials (Everyday materials)** revise work on materials from Year 1 list the uses of a particular material in and around school recognise that some materials are naturally occurring and some are not name some naturally occurring materials describe in simple terms how and why the use of materials has changed know the contribution made to materials science by John Boyd Dunlop	**Light (Light)** know that some objects produce light energy and that these are light sources know that some surfaces reflect light distinguish between light sources and objects that reflect light know that the Sun is a light source but the Moon is not know that some surfaces reflect light know which surfaces have the best reflective properties know that the eyes are the organs of sight recognise that they need light in order to see things and that dark is the absence of light know how to protect their eyesight, including protection from sun damage know that some substances allow light to pass through completely or partially and use the terms transparent, translucent and opaque know how shadows are formed know what determines the length of shadows	**States of Matter** Identify materials as solids, liquids or gases Describe the properties of solids, liquids and gases Know that solids consisting of very small pieces (e.g. sand) behave like liquids in some ways Know that there are gases all around us but they are invisible State the properties of gases Know how to use a thermometer Know that the same material can exist as both solid and liquid Name the changes of state Describe the water cycle in terms of changes of state	**Mixtures and Reactions (Properties and changes of materials** Extend their knowledge of properties to include more abstract properties such as hardness, thermal and electrical conductivity, magnetic attraction Know that metals have similar, specific properties Know that some materials dissolve in water and others do not and give examples of both Know that a substance is still present in the solution when it has dissolved Describe ways in which dissolved substances can be recovered from solution Understand that melting and dissolving are different processes Know that burning results in the formation of new materials including gases that we cannot see Know that chemical changes are usually not reversible Identify hazards associated with burning materials Recognise that chemical reactions form new substances and that this kind of change is not usually reversible Know how post-its and/or wrinkle-free cotton were developed	**Heart and Lungs (Animals including humans)** Describe the functions of blood, including clotting Know that blood is pumped round the body by the heart that there are different groups of human blood Describe the basic structure of the circulatory system Explain the functions of the heart, arteries veins and capillaries Describe the structure of the heart Explain the basic function of the heart Describe the structure of the lungs and the basic functions of the lungs Describe how the heart and lungs work together to keep us alive Know that the heart rate can be determined by taking a pulse, and where pulse points are found Relate these changes to the need for more oxygen and energy in the muscles Know that alcohol, smoking and the use of some drugs can harm the body Describe some of the short term and long term effects of alcohol, smoking and drugs

	Skills	**Yr 1 The Animal Kingdom (Animals including humans)** Sort and group different kinds of animals Compare the diet of these animals with the human diet Use a number of sources to find out about a common animal Make notes in order to include relevant key facts in a report about an animal	**Yr 2 Materials (Everyday materials)** find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. compare and contrast the advantages of using different materials for the same object compare the range and use of materials in a different time period with their use nowadays ask simple questions and recognise that they can be answered in different ways performing simple tests gather and record data to help in answering questions. Plan an investigation into material properties investigate the best paper for a food bag	**Yr 3 Light (Light)** set up a simple comparative and fair test make measurements using data loggers record findings using simple scientific language, bar charts, and tables reporting on findings and draw conclusions	Y4 **States of Matter** Begin to assign properties to different states of matter Set up simple comparative and fair tests to establish the factors that affect evaporation Record findings using simple scientific language, bar charts and/or tables Use results to draw simple conclusions	Y5 **Mixtures and Reactions (Properties and changes of materials** Match material properties to their use Separate solute from a solution by crystallisation Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering and sieving Plan an investigation to determine ways in which solids can be removed from liquids Report the findings from their investigation into treating sewage including conclusions and explanations of their findings Identify some changes as irreversible and explain reasons for doing so Identify substances through their chemical and physical changes	Y6 **Heart and Lungs (Animals including humans)** Record data and results using tables and line graphs Report and present findings from enquiries Through investigation, describe the changes that take place in pulse rate and breathing rate before, during and after exercise
	Key Vocabulary	bird, mammal, plant, flower, tree, weed, seed, bark, branch, twig, environment, respect, nature, wild, cultivated, animals, mini-beasts, insects, spiders, worm	material, properties, force, wood, glass, metal, fabric, plastic, stone, brick, rubber, opaque, malleable, transparent, hard, soft, bendy (flexible), rigid, elastic, texture, smooth, twist, stretch, bend, squash	light, dark, night, day, light source, Sun, Moon, torch, candle, lamp, glow, shine, reflect, sparkle, shine, reflected light, mirror, reflect	state, solid, liquid, gas, shape, volume, fixed, spread, compressed, squashed, change of state, melt, freeze, evaporate, condense, pour	property, material, glass, ceramic, rubber, wood, steel, aluminium, metal, non-metal, cotton wool, characteristic, hardness, magnetic attraction, opacity, thermal conductivity, electrical conductivity, flexibility	blood, circulate, heart, blood type, red cells, white cells, plasma, microscope, platelets, nutrients, oxygen, transfusion, carbon dioxide, clotting, infection, haemoglobin
	Assessment	KWL Self-assessment					
	Resources in school						

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Key Stage		Key Stage One		Key Stage Two			
Year Group		1	2	3	4	5	6
Autumn 2	Topic	Explorers	Victorians	Stone Age	Rainforests	The Anglo-Saxons	Magnificent Mountains
	Science Focus	The Animal Kingdom continued	Animals and their needs	Animals and skeletons	Classification	Human development	Electricity
	Knowledge & Understanding Biology Chemistry Physics	**The Animal Kingdom (Animals including humans)** Name the parts of the external human body (head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth lips etc.) Describe what we use these body parts for or what they do Discuss some basic ways of staying healthy – eating well, exercising, keeping clean Know the basic animal classes of birds, fish, amphibians, reptiles, mammals and invertebrates Know the basic animal classes of birds, fish, amphibians, reptiles, mammals and invertebrates Name the main body parts that characterise of different animal classes Describe the diet of some of the common British animals they have been studying Use the research from the previous week to contribute a report to a class book or blog about animals	**Animals and their needs (animals including humans)** know that animals grow in different ways know that mammals have live young but other animals do not describe how humans grow describe the basic needs of animals – food, air, warmth state some ways in which humans stay healthy know that eating a good diet is helps us stay healthy know that foods can be sorted into groups state the basic foods that are needed for a healthy diet and those foods that should be eaten in moderation Know how humans stay healthy – hygiene, exercise and rest observe the difference in growth of the animals since the previous week	**Animals and skeletons (animals including humans)** Know that animals need to eat because they do not make their own food as plants do. Understand and use the terms variable and value Know that the digested food is used for energy, to help us grow and to repair the body Know that different kinds of food are used for different things: protein for growth and repair, fat and carbohydrate for energy Come to a conclusion about the diet of an owl as a result of their findings Know that some animals have skeletons inside their bodies and others, such as insects and crustaceans, have a skeleton outside their bodies Note some differences in movement between animals with a skeleton and animals without a skeleton Know the main parts of the body associated with the muscular and skeletal system Know that different parts of the muscular-skeletal system have different functions Know that muscles are attached to the skeleton and help us move	**Classification (Living things and their habitats)** Describe the main events in the life of Carl Linnaeus Describe the contribution Carl Linnaeus made to our understanding of classification Understand how keys are constructed Describe the classification of vertebrates into fish, amphibians, reptiles, birds, and mammals Describe the classification of invertebrates into snails/slugs, worms, insects, crabs and spiders Recognise that some flowers such as grasses and some tree flowers do not have petals Describe the classification of plants into flowering plants (including grasses) and non-flowering plants such as ferns and mosses Identify, using support materials where necessary, the common animals and plants in the local area	**Human Development (animals including humans)** Describe the basic changes as humans develop from birth to old age Describe the changes that happen during puberty Describe the development of a baby Know how babies are born	**Electricity** Know how to stay safe when working with electricity Describe the use of different components within a circuit: cells, wire, switch, buzzer, bulb, motor Represent and reproduce simple circuits in diagrams using recognised symbols Describe the differences between series and parallel circuits Design and build a game that involves an electric circuit

	Skills	**Yr 1 The Animal Kingdom (Animals including humans)** Sort and group different kinds of animals Compare the diet of these animals with the human diet Use a number of sources to find out about a common animal Make notes in order to include relevant key facts in a report about an animal	**Yr 2 Animals and their needs (animals including humans)** take a first look at animals to be observed (tadpoles, chicks, butterfly etc.) observe the difference in growth of the animals since the previous week observe the difference in growth of the animals since the previous week design a healthy diet observe the difference in growth of the animals since the previous week Collate observations of animals into a single	**Yr 3 Animals and skeletons (animals including humans)** Using research methods, identify the diets of a number of animals including birds Classify animals as omnivores, herbivores and carnivores Develop a classification system for foods Investigate an owl pellet, making notes and observations Classify animals as vertebrates or invertebrates	Y4 **Classification (Living things and their habitats)** Use a key to identify an unknown plant or animal Create a key to identify a number of plants or animals Identify the characteristics of each class Correctly place unfamiliar vertebrates into one of these classes Identify the characteristics of each class Correctly place unfamiliar invertebrates into one of these classes Identify the characteristics of each class Correctly place unfamiliar plants into one of these classes Recognise that these animals and plants vary widely but that they can be sorted into different groups Recognise that environments can change and that this can sometimes pose dangers to living things	Y5 **Human Development (animals including humans)** Compare the human life cycle to the life cycle of other animals	Y6 **Electricity** Construct simple series circuits and identify the uses of different components Examine an unfamiliar diagram of a simple circuit and explain how they know whether it will work when constructed Investigate how differences in voltage affect the performance of components within a circuit Plan and carry out an investigation, ensuring a fair test Make accurate measurements and draw conclusions based on results Plan an investigation, recognising and controlling variables where necessary Take measurements, using a range of scientific equipment, with accuracy and precision, repeating readings when appropriate Record data and results of increasing using circuit diagrams, tables and line graphs Draw conclusion and explain the degree of trust in results Build simple series and parallel circuits to solve problems Design and build a game that involves an electric circuit Evaluate the game
	Key Vocabulary	bird, mammal, pant, flower, tree, weed, seed, bark, branch, twig, environment, respect, nature, wild, cultivated, animals, mini-beasts, insects, spiders, worm	mammals, eggs, live, young, birth, nest, parents, observation, description, notes, milk, hatch	diet, omnivore, invertebrate, carnivore, herbivore, mammal, plant, animal, bird, food, fish, reptile	environment, urban, impact, human, structure, damage, negative, no effect, positive, pollution, litter, enhance, survey, wildlife, plant life, habitat	life cycle, baby, toddler, child, teenager, adult, man, woman, maturity, adolescence, maturity, grow, develop, birth, pregnancy, old age, die	plug, mains electricity, battery, switch, bulb, motor, crocodile clips, wire, complete circuit, conductor, insulator, buzzer, fan, bright, dim
	Assessment	KWL Self-Assessment					
	Resources						

Redwell Science Intent 2022-2023

Key Stage		Key Stage One		Key Stage Two			
Year Group		1	2	3	4	5	6
Spring 1	Topic	Fire! Fire!	China	Extreme Earth: Volcanoes and Earthquakes	Fantastic Beasts	Raging Rivers	Vikings
	Science Focus	Everyday materials	Living things	Rocks	Animals including humans	Life cycles	Evolution
	Knowledge & Understanding Biology Chemistry Physics	Everyday materials Begin to name common materials and describe their properties. Distinguish between an object and the material it is made from. know that materials can be used in a variety of ways know that materials can be sorted in a variety of ways according to their properties know that materials are chosen for specific purposes on the basis of their properties know that there is a range of materials with different characteristics develop the vocabulary needed to describe material properties know that objects made from elastic or malleable materials can be altered by squashing, bending, twisting and stretching know that transparent objects let the light through but opaque objects do not	Living things (Living things and their habitats) understand that plants are living things know some of the characteristics of living things – movement, growth, excretion, reproduction, sensitivity know that all living things have certain needs understand that plants are living things know that plants are alive describe the differences between animals and plants	Rocks (Rocks) examine and describe different specimens of rock name some of the most common rocks describe in simple terms how igneous, sedimentary and metamorphic rocks are formed describe how fossils are made explain how the fossil record helps us learn about life millions of years ago	Digestion (Animals including humans) Describe the human teeth and their positions in the mouth Name the different sorts of teeth found in humans Know that children have milk teeth that are lost as adult teeth develop Understand the need to take care of your teeth and how to do this Describe the differences in teeth that have been cared for and those that have not Know that the tongue is the organ for taste and that it helps to move food into the oesophagus Name the different parts of the digestive system Outline the basic function of each part of the digestive system	Life Cycles (living things and their habitats) Recognise that flowering plants produce seeds from their flowers which grow into new plants Describe the life cycle of flowering plants including pollination, fertilisation, seed production, seed dispersal and germination Describe the structure of a flower, naming the main parts of the flower Describe different ways of growing new plants other than using seeds Know the difference between asexual and sexual reproduction in plants Know that all animals have a life cycle that includes being born, developing into an adult, reproducing, and eventually dying Know that life cycles vary from one class to another Know that insects and amphibians undergo metamorphosis	Evolution (Evolution and inheritance) Describe the contribution he made to scientific knowledge about evolution Understand the term evolution Describe ways in which animals are adapted to avoid predation, for example camouflage, use of warning colours in insects, spines on plants explain how fossils provide evidence for evolution explain how humans have evolved

	Skills	**Yr 1 Everyday materials (Everday Materials)** make and record observations about materials group materials together and make a record of groupings explore materials using appropriate senses, making observations and simple comparisons carry out simple tests use their observations and ideas to suggest answers to questions gather and record data to help in answering questions. present the data in a suitable manner provide a simple conclusion that answers the question	**Yr 2 Living things (Living things and their habitats)** classify items as living things, things that were alive and things that have never been alive	**Yr 3 Rocks (Rocks)** classify rocks according to their own criteria investigate the properties of igneous and sedimentary rocks carry out simple tests on rocks, recording results and drawing conclusions investigate the composition of soil use the investigation to come up with a model of how soil is formed use fossil pictures to draw conclusions about dinosaurs	Y4 **Digestion (Animals including humans)** Create a model of a digestive system Identify in the model each part of the digestive system and describe its basic function	Y5 **Life Cycles (living things and their habitats)** Make observations of plant and animal life cycles Compare the production of new plants through the planting of seeds and the taking of cuttings Research the life cycle of an unfamiliar bird and an unfamiliar mammal Describe the changes that occur during the growth and development of insects and amphibians Compare the life cycles of an insect and an amphibian in simple terms	Y6 **Evolution (Evolution and inheritance)** Research and recount the main events in the life of Charles Darwin Explore the reasons that some people do not believe that evolution happened and look at some creation stories from different religions, e.g. the Vikings Research the ways in which animals and plants are adapted to their environment Model evolution through the use of games/simulations Model and compare evolution and selective breeding
	Key Vocabulary	material, appearance, texture, property, wood, stone, fabric, plastic, clay, rubber, metal, glass, paper, cardboard, rough, smooth, hard, soft, shiny, dull	mammals, eggs, live, young, birth, nest, parents, observation, description, notes, milk, hatch	criteria, appearance, texture, weight, rough, smooth, sharp, hard, lumpy, cracked, flaky, coarse, flat, round, layered, glassy, sparkling, polished, jagged, shiny, crystalline, sandy, fine, grainy (granular)	classification, kingdom, university, voyage, biography, botanist, study	evidence, observation, measurement, life cycle, stage, offspring, metamorphosis, growth, germination, structure, habitat	biography, variation, inherited, natural selection, survival, naturalist, voyage, specimens, adaptation, evolution, hypothesis
	Assessment	KWL Self-assessment					
	Resources			Rocks and soil samples			

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Key Stage		Key Stage One		Key Stage Two			
Year Group		1	2	3	4	5	6
Spring 2	Topic	How does our food grow?	Arctic/Antarctic	Robots	Romans	Ancient Greeks	Frozen Kingdoms
	Science Focus	Plants	Habitats continued	Forces and magnets	Animals including humans continued	Forces	Classification
	Knowledge & Understanding Biology Chemistry Physics	**Plants (Plants)** know what a seed is and how to plant it know what a bulb is and how to plant it know what plants and seeds need to grow and how to take care of plants name the basic parts of a plant: stem, leaves, roots, flower, petals, fruit, bulb and seed know that bulbs grow into new plants distinguish between trees and other flowering plants know the main parts of a tree: trunk, roots, branches, leaves, fruit know that some trees are evergreen and do not lose their leaves in winter but others are deciduous and do identify trees as deciduous and evergreen name some common native trees know that some plants produce flowers which develop into seeds know that the fruit produced by trees contains its seeds discuss the idea of a "weed"	**Habitats (Living things and their habitats)** learn the term habitat and micro-habitat give examples of different habitats describe a woodland habitat describe the kind of microhabitats found in woodland know some of the common woodland animals and plants describe a seashore habitat describe the kind of microhabitats found in the seashore know some of the common seashore animals and plants know that living things should be treated with respect identify some animals and plants living in and around ponds know that plants do not need to eat because they make their own food know that some animals are carnivores, some are herbivores and some are omnivores understand the term food chain and cite some simple examples of food chains	**Forces and Magnets (Forces and magnets)** Identify forces as pushes, pulls or twists Know that a force can change the speed, direction or shape of an object Know that force is measured using a force meter and that the units of measurement are Newtons. Recognise that many forces require a contact between them for the force to take effect Know that friction is a force between two surfaces that slows objects down Describe some factors that affect friction Describe what a magnet is Know that magnets can exert forces at a distance Know that magnets have two ends called poles that attract or repel each other depending on how they are arranged Describe some everyday uses for magnets Describe some uses of magnets Summarise their learning about magnetism	**Digestion (Animals including humans)** Know that all food chains start with plants that create their own food using energy from the Sun Know that some animals are predators and some are prey, Understand food chains and use them to describe feeding relationships Identify animals that are predators, those that are prey and those that are both	**Forces** Know that the Earth and objects are pulled towards each other; this gravitational attraction causes objects to have weight Know that weight is a force and is measured in Newtons and that mass is the amount of matter and is measured in kilograms Know that air resistance slows moving objects Know that when an object falls, air resistance acts in the opposite direction to the weight Know that when an object is submerged in water, the water provides an upward force (upthrust) on it Know that things will float if the upthrust is greater than the weight Know that water resistance acts to slow down objects that are moving through the water Compare air and water resistance Know that the force between two moving surfaces in contact is called friction Know that friction can be useful or a problem and provide examples of both Describe how simple machines such as gears, levers and pulleys are used to transfer forces or to change speed or direction	**Classification (living things and their habitats)** Name the five kingdoms of living things Describe the characteristics of different vertebrate and invertebrate groups Understand that there is a great variety of living things Understand the term biodiversity Know about some of the threats to biodiversity, including the threats posed by humans Know that micro-organisms living things that are often too small to be seen with the naked eye Know that whilst some micro-organisms bring about disease many others are useful State some of the uses for yeast

	Skills	**Yr 1 Plants (Plants)** sort and group a variety of objects into seeds and non-seeds monitor the growth of seeds and bulbs planted last week/ 2 weeks ago/ 3 weeks ago/ 4 weeks ago/ 5 weeks ago compare a wild area and a garden use observations notes and charts to describe the growth of seeds/bulb	**Yr 2 Living things (Living things and their habitats)** classify items as living things, things that were alive and things that have never been alive	**Yr 3 Forces and Magnets (Forces and magnets)** Provide examples of useful and non-useful friction in everyday life Classify materials as magnetic or non-magnetic Determine a general rule for predicting which materials are magnetic Investigate the relationship between the size of a magnet and its strength	Y4 **Digestion (Animals including humans)** Link the use of the terms predator and prey to the terms herbivore, omnivore and carnivore Construct a food web to show more complex feeding relationships	Y5 **Forces** Be able to use a force meter carefully, interpreting the scale correctly Investigate a range of simple machines: pulleys, gears, ramps, wheel and axle and levers Build a catapult and describe how it works, identifying any simple machines in its construction Evaluate the catapult they have built	Y6 **Classification (living things and their habitats)** Create a key to identify microorganism classes Observe the growth of yeast and the waste products of yeast Investigate the things yeast needs to grow
	Key Vocabulary	seed, bulb, grow, plant, compost, water, sprout	alive, animal, earthworm, category, move, dead, plant, food, sort, senses, living, non-living, classify, natural, human, wormery, soil, chalk, sand, leaves	force, Newton, twist, force meter, direction, compress, pull, speed, stretch, push, distance, shape	tooth, teeth, decay, carnivore, herbivore, omnivore, incisor, canine, pre-molar, gum, saliva, tongue, taste, sweet, salt, sour, bitter, taste buds	force, gravity, speed, acceleration, fall, attract, planet, Moon, Newtons, force meter, kilograms, weightless	classification, kingdom, order, plants, flowering plants, conifers, ferns, mosses, algae, animals, vertebrates, invertebrates, mammals, birds, fish, reptiles, amphibians, arthropods, insects, characteristic, species
	Assessment	KWL Self-assessment					
	Resources						

Redwell Science Intent 2022-2023

Key Stage		Key Stage One		Key Stage Two			
Year Group		1	2	3	4	5	6
Summer 1	Topic	Toy Story	Castles	South America / Bean to Bar	Tudors	Space	British Empire
	Science focus	Everyday materials continued	Animals and their needs	Animals and skeletons continued	Electricity	Earth and space	No science in Summer 1
	Knowledge & Understanding Biology Chemistry Physics	Everyday materials Begin to name common materials and describe their properties. Distinguish between an object and the material it is made from. know that materials can be used in a variety of ways know that materials can be sorted in a variety of ways according to their properties know that materials are chosen for specific purposes on the basis of their properties know that there is a range of materials with different characteristics develop the vocabulary needed to describe material properties know that objects made from elastic or malleable materials can be altered by squashing, bending, twisting and stretching know that transparent objects let the light through but opaque objects do not	Animals and their needs (animals including humans) know that animals grow in different ways know that mammals have live young but other animals do not describe how humans grow describe the basic needs of animals – food, air, warmth state some ways in which humans stay healthy know that eating a good diet is helps us stay healthy know that foods can be sorted into groups state the basic foods that are needed for a healthy diet and those foods that should be eaten in moderation Know how humans stay healthy – hygiene, exercise and rest observe the difference in growth of the animals since the previous week	Animals and skeletons (animals including humans) Know that animals need to eat because they do not make their own food as plants do. Understand and use the terms variable and value Know that the digested food is used for energy, to help us grow and to repair the body Know that different kinds of food are used for different things: protein for growth and repair, fat and carbohydrate for energy Come to a conclusion about the diet of an owl as a result of their findings Know that some animals have skeletons inside their bodies and others, such as insects and crustaceans, have a skeleton outside their bodies Note some differences in movement between animals with a skeleton and animals without a skeleton Know the main parts of the body associated with the muscular and skeletal system Know that different parts of the muscular-skeletal system have different functions Know that muscles are attached to the skeleton and help us move	Electricity Identify that a number of common appliances and pieces of equipment use electricity Know that some appliances use mains electricity and some use batteries Know the dangers of mains electricity and how to avoid them Understand that a flow of electricity (electric current) is only possible when there is a complete loop of conducting material Know that some materials let electricity flow through them and others do not Recognise that all metals are conductors and most non-metals are insulators Know that air is an insulator Describe the purpose of different components in a circuit components, including switches and buzzers Describe the relationship between the numbers of batteries, the numbers of bulbs and the brightness of bulbs Know that too much current will cause the bulb to blow	Earth and Space Describe the relative motion of the Earth, the Moon and the Sun State the difference between a sun, a planet and a moon Know that the Sun, planets and moons in the solar system are approximately spherical in shape Explain how ideas about the solar system have changes through the centuries Identify the eight planets within the solar system and their positions relative to the Sun Compare planets in terms of atmosphere, time to orbit the Earth, period of rotation, number of moons etc Explain night and day in terms of the rotation of the Earth Describe and explain in simple terms how the appearance of the Moon in the sky changes over the course of 28 days	

	Skills	**Yr 1 Everyday materials (Everday Materials)** make and record observations about materials group materials together and make a record of groupings explore materials using appropriate senses, making observations and simple comparisons carry out simple tests use their observations and ideas to suggest answers to questions gather and record data to help in answering questions. present the data in a suitable manner provide a simple conclusion that answers the question	**Yr 2 Animals and their needs (animals including humans)** take a first look at animals to be observed (tadpoles, chicks, butterfly etc.) observe the difference in growth of the animals since the previous week observe the difference in growth of the animals since the previous week design a healthy diet observe the difference in growth of the animals since the previous week Collate observations of animals into a single document to describe the growth of the animals in the study	**Yr 3 Animals and skeletons (animals including humans)** Using research methods, identify the diets of a number of animals including birds Classify animals as omnivores, herbivores and carnivores Develop a classification system for foods Investigate an owl pellet, making notes and observations Classify animals as vertebrates or invertebrates	Y4 **Electricity** Associate the use of batteries with the need for less power Construct a simple circuit involving batteries Relate some incidents in the history of electricity (using secondary sources) Investigate the effect of changing components in a series circuit Make systematic and careful observations Using their knowledge of electricity, construct and test a burglar alarm for a house	Y5 **Earth and Space** Investigate differences in the time of day and the length of day in different parts of the World Investigate factors that affect the formation of craters, taking measurements with increasing accuracy and precision, taking repeat readings when appropriate	
	Key Vocabulary	material, appearance, texture, property, wood, stone, fabric, plastic, clay, rubber, metal, glass, paper, cardboard, rough, smooth, hard, soft, shiny, dull	mammals, eggs, live, young, birth, nest, parents, observation, description, notes, milk, hatch	diet, omnivore, invertebrate, carnivore, herbivore, mammal, plant, animal, bird, food, fish, reptile	*mains electricity, battery, electricity, appliance, electric shock, electrocution, wire, plug, socket, adapter, current, power, power station, electricity substation, RCD/circuit breaker, pylon*	Earth, Sun, planets, orbit, sphere, horizon, Moon, astronomer, astronomy, distance, heavenly body	
	Assessment	KWL Self-assessment					
	Resources						

Redwell Science Intent 2022-2023

Key Stage		Key Stage One		Key Stage Two			
Year Group		1	2	3	4	5	6
Summer 2	Topic	What a Wonderful World (Gambia)	Madagascar	Ancient Egypt	Urban Life and Diversity	Endangered Earth	Mayans
	Science Focus	The Weather	Plants	Plants	Sound	Decay and recycling	Light
	Knowledge & Understanding Biology Chemistry Physics	**The weather (Seasonal Changes)** Describe the changes in the weather with the seasons Provide a fictional weather forecast for a month of the year Learn how to stay safe in the sun. Learn about the effects of the Sun in the UK and around the world Know that rain comes from clouds Know that not all clouds produce rain and that there are different kinds of clouds Look at different types of storm around the World – hurricanes, tornados, monsoons Know that some storms in the UK are accompanied by thunder and lightning Know that snow comes from clouds Know that some parts of the world and some seasons are more likely to have snow	**Plants (Plants)** give a basic explanation of what a seed is know that plants have stem, leaves, roots (recap of Year 1) know that plants lose water from their leaves know that bulbs and seeds differ in structure and formation know that plants provide humans and other animals with food identify the parts of the plant that are consumed for a range of vegetables describe how plants change through the seasons know that some plants are perennial and some are annual or biennial describe the difference between perennial plants and annual plants know, through investigation, that seeds and bulbs need water and warmth but not light to grow know that growing plants need light to stay healthy	**Plants (plants)** use their knowledge of plants to plan and set up an investigation into plant growth set up a simple experiment take careful measurements and make systematic observations describe the structure of a flowering plant explain that water moves from the roots through branches and stems to leaves and flowers describe some methods of seed dispersal explain why seeds need to be dispersed describe the life cycle of a flowering plant describe the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal generate oral and written reports on the findings of their investigation explain that plants do not need to eat food because they make their own describe why plants need water, light, space and nutrients for growth	**Sound** Associate sound with vibrating objects Describe a range of ways of getting things to vibrate Describe how the shape of our ears helps us hear Describe the basic structure of the ear Establish that sounds get fainter as the distance increases Know that sound travels through solids and liquids as well as air Associate loudness with stronger vibrations understand what pitch is describe some ways of changing the pitch of a vibrating object	**Decay and Recycling** Know that some things decay and others do not Know that some living things are decomposers Know that some materials can be recycled Describe the process of decay and its usefulness Know that some materials can be recycled into useful new materials Describe some of the factors that will accelerate or slow down decay Consider some of the ethical and financial aspects of recycling and waste	**Light** describe and give examples of light sources state some basic properties of light know that light travels in straight lines Know that many objects reflect light 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 Know the basic structure of the eye

	Skills	**Yr 1 The weather (Seasonal Changes)** Make and use simple instruments for observing the weather, setting up a simple weather station Take measurements from the weather station and observe the weather outside Take measurements from the weather station and observe the weather outside Make a rainbow Take measurements from the weather station and observe the weather outside Take measurements from the weather station and observe the weather outside	**Yr 2 Plants (Plants)** distinguish between seeds and other similar materials predict whether plants need water, warmth and/or light to grow make appropriate measurements and observations of plant growth make measurements and record observations of the growth of seeds and bulbs to draw conclusions from a range of experiments about what plants need for growth	**Yr 3 Plants (plants)** recording findings using simple scientific language and measurements observe the movement of food dye through a flower use results to draw simple conclusions, suggest improvements and raise further questions use straightforward scientific evidence to support their findings	Y4 **Sound** Create sounds in a variety of ways Use their ears to listen to and identify sounds Investigate the effectiveness of different materials to muffle sound Use their knowledge of how sound is made to make and play a musical instrument	Y5 **Decay and Recycling** Plan a scientific enquiry with help Observe closely, recording findings Identify materials that will decay Plan a scientific enquiry to find decay times of common materials, recognising and controlling variables Record findings and estimate degree of trust in results From investigation, estimate the time needed for some common materials from litter to decay Plan a scientific, recognising dependent, independent and control variables Select appropriate methods for presenting data Present reasoned, well evidenced conclusions	Y6 **Light** investigate changes in shadows depending on the relative positions of the light source and object and the use of filters plan an investigation, recognising and controlling variables take measurements with accuracy and precision, repeating readings when appropriate record results using scientific diagrams, tables, and graphs Establish the best arrangement of light source and position of object in a shadow puppet theatre Devise and perform a shadow puppet show using their knowledge of shadows to add dramatic interest Represent the direction of a beam or ray of light travelling from a light source by a straight line with an arrow Use the properties of reflection to make periscopes
	Key Vocabulary	Weather, season, spring, summer, autumn, winter, typical, climate, measure, predict, weather forecast, weather station, weather satellite, sun, temperature, wind, rain, rainfall, clouds, precipitation, fog, frost, mist, snow, thunder, symbol	Plant, root, seed, leaf, leaves, bud, flower, fruit, vegetable, sprout, treelight, shrivel, wilt, soil, bean, nut compost, excrete water, germinate, edible, store, stem, taproot, humans, warmth, temperature, die, annual, biennial, perennial, evergreen, decudious, healthy, grow, propagator, evaluation	Seed, seedling, conditions, observations, thermometer, water, compost, variable, recording, ruler, soil, light, prediction, results table, filter, data logger, light sensor, measurement	Sound, hear, detect, hearing, sense, ear, noise, loud, soft, quiet, vibration, sound wave, travel, air, volume, squashed, stretched, amplify, compression, rarefaction	Decay, rot, compost, nutrients, decomposers, bacteria, funghi, waste, scavengers, fertiliser, break down, litter, recycle, reuse	Light, ray, beam, light source, data logger, light sensor, Lux, opaque, transparent, translucent, object, shadow, reflection, mirror, eye
	Assessment	KWL Self-assessment					
	Resources						