Roxbourne Science Curriculum

Year Group		HT1	HT2	HT3	HT4	HT5	HT6
Reception		The Human Body	Seasonal Changes	Materials	Plant and Animal Lifecycles	Pond Habitats	Forces
Year 1	Discipline	Chemistry	Physics	Biology	Biology	Physics	Biology
	Unit	Everyday Materials	Autumn and Winter	Amazing Animals	Amazing Animals	Spring and Summer	Common Plants
	Objectives	• what materials are and the names of different materials • what different materials look like • which materials different objects are made from • what some the properties of different materials are and if materials can have other properties • some properties are easy to see but others need to be investigated • how the properties of materials mean they are used to make certain objects • how to group, sort, and compare objects and materials	• names of the four seasons • which months are in each of the four seasons what we mean by the word 'weather' • weather patterns, weather symbols and what the weather is like in both autumn and winter • how we, as humans, might dress differently according to the weather outside • how daylight hours change across autumn and winter • the impact of changing weather and seasons on different plants and animals	• recognise and name a variety of common animals including fish, amphibians, reptiles, birds, and mammals • recognise and name a variety of common animals that are carnivores, herbivores, and omnivores • know similarities and differences across a variety of common animals (fish, amphibians, reptiles, birds, and mammals, including pets) • recognise and name the basic parts of the human body and say which part of the body is associated with each sense		• recognise and name a variety of common animals including fish, amphibians, reptiles, birds, and mammals • recognise and name a variety of common animals that are carnivores, herbivores, and omnivores • know similarities and differences across a variety of common animals (fish, amphibians, reptiles, birds, and mammals, including pets) • recognise and name the basic parts of the human body and say which part of the body is associated with each sense	• what a plant is and the basic parts of a plant • recognise and name common garden plants • recognise and name common wild plants • recognise and name different types of trees • know why plants are important
Year 2	Discipline	Biology	Chemistry	Biology	Biology	Biology	Biology
	Unit	Animals and Survival	Uses of Materials	Living Things and their Habitats	Living Things and their Habitats	Protecting our Environment	Plants and Growth
	Objectives	• the things that animals need to survive. • know how animals change as they grow • know why exercise is important to health • what a balanced diet is and apply this knowledge to understanding their own diet • understand what hygiene is and why it is important	• the materials different objects are made from • how materials are used in their local area gather and use data to compare the suitability of different materials • perform simple tests to explore how the shapes of objects made from some materials can be changed • suggest ways to stop plastic pollution • understand how new materials have been/are discovered	• recognise and classify objects and organisms as: alive, dead, or never alive • explore how we know if an object or organism is alive – using the life processes • know some of the different habitats plants are found in • investigate and name the minibeasts found in a range of different microhabitats • which animals are found in different world habitats with a focus on the Arctic and the Sahara • understand simple food chains using the vocabulary carnivore, herbivore, omnivore, predator and prey • understand that habitats can change over time		• why we need to protect our planet • what we mean by the word 'environment' • why trees are so important for the environment • how habitats can be negatively impacted • how their local environment is being impacted • the different ways in which we can save or conserve water and electricity • how their actions at home could support the protection of the environment	• what seeds are and the different types of seeds • that plants can grow from seeds but can also grow from bulbs • what is meant by 'seed dispersal' • what is meant by 'germination' and that seeds need certain conditions to germinate • the needs of a plant for survival after the initial germination stage
Year 3	Discipline	Biology	Chemistry	Physics	Physics	Biology	Physics
	Unit	Skeletons and Muscles	Rocks and Fossils	Light and Shadows	Light and Shadows	Plants: Needs for Survival	Forces and Magnets
	Objectives	• what a human skeleton looks like • what the function of the human skeleton is in terms of movement, support and protection • how bones and muscles work together • the different types of muscle found within our bodies • how skeletons vary between different animals – endoskeletons, exoskeletons and hydrostatic skeletons • what nutrition is and how it is obtained through eating different food groups • how different animals get the nutrition they need	• what rocks are and how they can be classified as either sedimentary, igneous or metamorphic • the properties of different types of rocks – in particular, durability and permeability • how different rocks can be used and how those uses are based upon their properties • what fossils are and what they can tell us about the past • who Mary Anning was • the process of fossilisation and the different types of fossil • what soil is, what soil is made from and whether all soils are the same	• there are different sources of light and those sources can be natural or man-made • who Thomas Edison was and why he is considered significant • darkness is the absence of light and light allows us to see things • light is reflected from surfaces • some objects are opaque, some are transparent, and some are translucent • shadows are formed when light is blocked by an opaque object • position, shape and size of a shadow can be varied • light is dangerous and we can take steps to protecting our ourselves from the Sun • the different uses of mirrors		• what a plant needs to grow • the impact of fertiliser on a growing plant • plants have roots to absorb water and nutrients but also to anchor the plant in the ground • plants have a stem as it is needed to support the plant and transport water from the roots • plants have leaves because they play an important part in how a plant produces its own food • that flowering plants produce flowers as an important part of their lifecycle • the stages in the lifecycle of a flowering plant	• what forces are in terms of pushes and pulls • that gravity and friction are forces • how objects move on different surfaces • what a magnet is and what different magnets look like • that a magnet has two poles • how magnets react to each other • materials can be magnetic or non-magnetic • how to investigate whether a material is magnetic • how magnets are used in real-life scenarios to make some tasks much easier
Year 4	Discipline	Biology	Chemistry	Biology	Biology	Physics	Physics
	Unit	Teeth and Digestion	States of Matter	Classification and Environments	Classification and Environments	Sound	Electricity
	Objectives	• the names of the different types of human teeth and the function of each type • the importance of looking after teeth and what can happen if we do not look after our teeth • how eating and drinking can damage teeth over time • that not all animals have the same teeth • the teeth that animals have greatly depend on whether that animal is a carnivore, an omnivore or an herbivore • the different organs that make up the digestive system • how the digestive system functions as a whole system	• what the three states of matter are and the properties of each one. • the processes of melting and freezing and how these processes affect the properties and state of a substance • some of the conditions that can affect melting and freezing for example temperature • what the processes of evaporation and condensation are • what the water cycle is • where the processes of evaporation and condensation fit into the water cycle • the importance of the water cycle for plants and animals	• a habitat is the natural home of an organism • all living organisms display the seven characteristics of life • organisms within a habitat or ecosystem are interdependent • the relationships between organisms can be represented by food chains and food webs • the difference between a vertebrate and an invertebrate • vertebrates can be classified into five different groups • invertebrates can be classified into seven different groups • characteristics of animals supports us with classification • we can use a key to identify and classify animals • plants can be classified as flowering or non-flowering • non-flowering plants can be classified into three groups • who Libbie Hyman was and why she is considered significant • that environments can change due to natural causes and through the actions of humans and that these changes can be both positive and negative • the organisms and habitats found within their own local environment and how these are changing		• sound is a form of energy which is produced when somethingvibrates • different instruments make sound in different ways • sound travels in waves • how sound travels through solids, liquids and gases • what makes up the inside of our ears • how we hear and how we can protect our hearing • volume is the intensity of sound and is determined by the strength of vibrations • pitch is how high or low a sound is and is controlled by the speed of vibrations • the distance we are from a sound impacts the volume at which we hear the sound	• electricity is a form of energy which powers many things we use everyday • an electric current is a flowing charge of electricity • there are renewable and non-renewable methods of producing electricity • some appliances use electricity and others do not • it is important to be safe and sensible around electricity • what a circuit is and which components are needed to construct a circuit • the difference between a complete and incomplete circuit • how the brightness of a bulb can change within a circuit • the function of a simple switch within a circuit • which materials are conductors and insulators of electricity and how to investigate this property
Year 5	Discipline	Physics	Physics	Chemistry	Chemistry	Biology	Biology
	Unit	Earth and Space	Forces	Properties and Changes of Materials	Properties and Changes of Materials	Life Cycles	Getting Older
	Objectives	• what a sun is, what a solar system is, what a galaxy is and how our own solar system fits in to the wider universe • which planets make up our own solar system • knowledge of the inner and outer planets of the solar system including order, size, what the planet consists of, atmosphere, temperature, rotation and orbit • what the relationship is between the Earth and the sun in relation to night and day • what a time zone is and how the different time zones are arranged across the world • what the relationship is between the Earth and the sun in relation to seasons • how daylight hours change across the year in different places across the world • what a moon is and what the phases of our own moon are • the heliocentric and geocentric theories of the solar system • the flat and spherical Earth theories • the views of various astronomers over time: Aristotle, Ptolemy, Alhazen, Tusi, Copernicus and Galileo	• the names of a range of different forces – gravity, friction, water resistance, air resistance, upthrust and magnetism • which forces are pushes and which are pulls • the difference between contact and non-contact forces • the difference between balanced and unbalanced forces • who Isaac Newton was and the role he played in helping us to understand forces • what 'matter' is, the difference between mass and weight and how we measure both • how friction works in the world around us • how air resistance works in the world around us • who Galileo Galilei was and the role he played in helping us to understand air resistance • how upthrust (or buoyancy) and water resistance act in water • what 'density' is and the relationship between density and whether an object is able to float • what levers, pulleys and gears are and what they can do to the strength and size of a force	• materials can be grouped based on their properties including hardness, solubility, transparency and conductivity • what we mean by 'dissolving' and whether certain substances dissolve in water to form a solution • whether the rate at which a substance dissolves can be altered by heat or stirring • mixtures can be sometimes be separated by sieving, filtering and/or evaporation • the difference between a reversible and an irreversible change • examples of reversible and irreversible changes the impact of heating and cooling on a range of different materials • what happens when something burns • how new materials are usually formed after an irreversible change • the chemists and scientists who have created new materials that we use in our everyday lives		• the difference between sexual and asexual reproduction • the process of pollination and the role it plays in the lifecycle of a flowering plant • how plants reproduce both sexually and asexually • how different animals produce offspring • how lifecycles differ between animals • how and why gestation periods differ between animals • what a naturalist is and why both Jane Goodall and David Attenborough are considered significant	• humans grow and change throughout the human lifecycle • how to place the stages of the human lifecycle on a timeline • the stages of development in babies and children • an introduction to what puberty is • how humans change from adulthood to old age • the changes experienced in old age
Year 6	Discipline	Physics	Biology	Biology	Biology	Physics	Biology
	Unit	Light and Perception	Classification	Evolution and Inheritance	Evolution and Inheritance	Electricity and Circuits	Circulation and Lifestyle
	Objectives	• that we see when light is reflected from an object into our eyes • light travels (or appears to travel) in straight lines • the parts of the human eye and how the eye works • reflection is when light bounces off a surface and changes the direction of the ray of light • the angle of incidence is always equal to the angle of reflection • how light behaves in water (refraction) • clear white light is made of 7 colours • the colours we see are known as the visible spectrum • light waves can be absorbed, transmitted or reflected to create colour, white or black • how shadows are formed and that they are the same shape as the object that cast them • what light pollution is and its impact on both humans and animals	• who Carl Linnaeus was and how his work influenced the classification of living things • how to use the Linnaean System of classification • the six kingdoms used in classification are: kingdom archaea, Kingdom Bacteria, Kingdom Protista, Kingdom Fungi, Kingdom Plantae and Kingdome Animalia • how to classify vertebrates and invertebrates • how to classify plants – beginning with vascular and non-vascular • what microorganisms are and how they can be classified • the positive and negative impacts of microorganisms • how habitats are important for the conservation of species	• why the information fossils give us is so important • who Mary Anning was and why her findings are significant living things have adapted or changed over time to be able to survive in their environments • why animals need to adapt to their environments • natural selection is when living things are better adapted to their environments and have a greater chance of survival • evolution takes a very long time and animals do not simply chose to evolve • who Charles Darwin and Alfred Wallace were and why they are considered significant • why living things produce offspring of the same kind • why offspring vary and are not identical to their parents		• electricity is a type of energy produced when electrons move around very quickly and create a current • electricity can be produced by generators which can be powered by renewable and non-renewable sources • electrical components in a circuit can be represented by symbols • the symbols for a bulb, cell, battery, buzzer, motor and switch (on and off) • what happens to the components in a circuit if a component is added to the circuit or a component is changed • the difference between a parallel and a series circuit • we measure electricity in volts (V)	• the circulatory system consists of the heat, the lungs and the systemic system • the role the heart play in the circulatory system • the names of the different parts of the human heart • human blood consists of plasma, white blood cells and platelets and red blood cells • the role the lungs play in the circulatory system • how heart rate differs before and after exercise • how nutrients are moved around the body by the circulatory system after they are broken down by the digestive system • how diet, exercise and lifestyle impact the heat and the body • what drugs are (legal and illegal) and the impact of different drugs on the human body