Ashley Junior School
Science Curriculum

	Autumn Term	Spring Term	Summer Term
Yr 3	**Animals Including Humans** **Pupils should be taught to:** Know animals (including humans) need the right types of nutrition and that they get nutrition from the food they eat Different animals are adapted to eat different types of food (i.e. carnivores eat meat, herbivores eat plants and omnivores eat both) The food groups which should be eaten by humans and food from which we can get these. (Carbohydrates, Meat and Fish (or substitutes), Dairy, Fatty/Sugary foods and fruit and vegetables). That certain people make choices not to eat food from animals (vegetarians and vegans) and that is why they need substitutes to provide proteins for muscle repair Know some humans and some other animals have skeletons and muscle for support, protection and movement Many animals have skeletons to provide support for their bodies and to protect organs (vertebrates and invertebrates) Humans are vertebrates which is why we have a skeleton The role of the skull and ribs in protecting the brain and heart / lungs respectively. Muscles are connected to bones and move them when they contract Movable joints connect bones together to allow movement **Rocks and Soils** **Pupils should be taught to:** Compare and group together different kinds of rocks on the basis of their appearance and simple	**Forces and Magnets** **Pupils must be taught to:** Compare how things move on different surfaces Friction is a force which opposes movement on surfaces Friction is dependent on the contact points between the surface and the moving object (e.g. car tyre and road) 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 There are visible and invisible forces and the differences between the two. For example magnetism and gravity are invisible forces because you cannot see them acting between to objects (there is no obvious push or pull). Magnets have a North and South pole Magnets exert an attraction force on certain materials (all of which are metal) Magnetic forces can work through some materials and still produce attraction Magnets attract or repel each other depending which poles are facing each other (North and South attract while like poles repel). Magnet forces are affected by magnet strength, object mass, distance from object and object	**Plants** **Pupils must be taught to:** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers Flowering plants have evolved specific parts to carry out pollination, fertilisation and seed growth Flowers have brightly coloured petals to attract insects, like bees, which carry pollen between different plants to enable them to grow seed so they reproduce Seed dispersal improves chances of enough seeds germinating and growing into mature plants 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 Plants need air, light, water, nutrients from the soil and room to grow in order to survive Plants have roots to provide support under the ground and to draw moisture from the soil, through the stem to take water to the rest of the plant Leaves absorb sunlight and carbon dioxide. Plants use the sunlight for energy to help it turn water and carbon dioxide into food. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Seeds and bulbs need the right conditions to germinate and contain a food store for the first stages of growth (i.e. until the plant can produce its own

	physical properties There are different types of rock which are formed in different ways Begin to understand the differences between sedimentary, metamorphic and igneous rocks Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise fossils are animals remains which have been trapped in rock when sediments have been formed Soils are formed from rocks and organic which have decomposed over time Be able to recognise that soils are made from rocks and organic matter. Rocks and cliff faces are affected by erosion Erosion is a process where rock is ground down and worn away and this is how sand or soil is formed	material. **Light** **Pupils must be able to:** Recognise that they need light in order to see things and that dark is the absence of light We need light to see things, even shiny things. There must be light for us to see and without light it is dark. *Here deal with the popular misconception shiny things glow in the dark.* Notice that light is reflected from surfaces Light beams bounce of some materials and this is called reflection Shiny materials reflect light beams better than non-shiny materials Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Pupils must be taught that light directly from the sun can be dangerous if you look straight at it. Recognise that shadows are formed when the light from a light source is blocked by a solid object Find patterns in the way that the size of shadows change. Light comes from a source which mean we can see (for example the sun or light bulbs). Transparent materials let light through them and enable us to see through them Translucent materials allow light through but not well enough for us to see through them Opaque materials do not let light through them	food.)
Yr 4	**Sound** **Pupils should be taught to:** Know how sounds are made Talk about how the strength of the vibrations of an object creating a sound can affect how loud the sound	**Animals including Humans** **Pupils should be taught to:** Build a food chain and state the producers, predators and prey. Different animals are adapted to eat different	**States of Matter** **Pupils should be taught to:** Know some materials change to a different state when they are heated Materials change state by heating and cooling

	can be Talk about how the size or shape of an object creating a sound can affect what the sound will be like Sound is produced when an object vibrates Sound moves through all materials by making them vibrate Faster vibrations (higher frequencies) produce higher pitched sounds Changing the shape of, size and material of an object will change the sound it produces Changing the way an object vibrates changes its sound Bigger vibrations produce louder sounds and smaller vibrations produce quieter sounds Know that sounds travel through air (or water) to reach the ear. Know that sounds get fainter as you move away from the place where the sound is being made. Sound travels from its source in all directions and we hear it when it travels to our ears Sound travel can be blocked Sound spreads out as it travels **Electricity** **Pupils should be taught to:** Be able to list a number of common objects that need electricity to function Electricity powers many common appliances Know metals are good conductors and name some as well as good insulators Some materials allow electricity to flow easily and these are called conductors. Materials that do not allow electricity to flow easily are called insulators Tell whether a bulb will light by knowing that a circuit is a complete loop with a battery	types of food Nutrients produced by plants move to primary consumers then to secondary consumers through food chains Describe some of the ways food is digested in the digestive system in humans. In digestion food is initially broken by teeth and then even further in the stomach and intestines where nutrients go into the blood.] Blood carries nutrients around the body. Know the different types of human teeth and their jobs Animals have teeth to help them eat. Different types of teeth do different jobs. Humans have incisors, canines, pre-molars and molars. Incisors bite food; canines tear food; molars are used for chewing food.	Heating causes solids to melt into liquids and liquids to evaporate into gases Cooling causes to condense into liquids and liquids to freeze into solids The temperatures at which given substances change state are always the same When two or more substances are mixed and remain present the mixture can be separated Some changes can be reversed and some cannot Be able to describe the differences between solids, liquids and gases and use this to group materials Solids, liquids and gases are described by observable properties Materials can be divided into solids, liquids and gases Be able to talk about evaporation and condensation as part of the water cycle Know that more water evaporates when the temperature is higher Evaporation is when water rises from the ground to the sky because it gets warmer. Condensation is when water in the air cools and this is what forms rain in clouds. **Living Things and their Habitats** **Pupils should be taught to:** Know how to use a classification key in science to identify an animal or plant. Be able to group living things in many ways - such as their size, their appearance, their habitat or needs. Living things can be divided into groups based on their characteristics Know that an environment may change over time, and this can be dangerous for the living things in the environment. Different food chains occur in different habitats Human activity significantly affects the environment

	Build a series circuit and name the cells, wires, bulbs, switches and buzzers Know what a switch can do when I build or look at a circuit A complete circuit is needed for electricity to flow and devices to work A source of electricity (mains or battery) is needed for electrical devices to work Electricity sources push electricity round a circuit More batteries will push the electricity round the circuit faster Devices work harder when more electricity flows through them		Environmental change affects different habitats in different ways Different organisms are affected in many ways by environmental change Living things have adapted to their habitats and any environmental change can have severe consequences for these plants and animals
Yr 5	**Earth and Space** **Pupils should be taught:** That day and night occur as the Earth rotates. Objects like planets, moons and stars spin As the earth rotates the two sides face the sun at different times. We have daytime when our sun is facing the sun and night when the light is blocked by the other side. To describe how the Moon moves around the Earth. Stars, planets and moons have so much mass they attract other things, including each other, due to a force called gravity. Gravity works over a distance. Objects with bigger masses exert bigger gravitational forces Smaller mass objects like planets orbit large mass objects like stars How the Earth and other planets move around the solar system. That the Sun, Earth and Moon are approximately spherical in shape. The Sun is at the centre of our Solar System and the planets rotate around it and the moons rotate around the planets	**Forces** **Pupils should be taught to:** I know that air resistance, water resistance and friction all act on objects to slow them down. Air resistance and water resistance are forces against movement caused by objects having to move air and water out of the way Friction is a force caused by two surfaces rubbing together – the more contact points here the larger the force I know that levers, pulleys and gears can turn a small force into a greater force. Some objects need large forces to make them move and gears, pulleys and levers can reduce the amount of force which is required to do this I can describe the force of gravity to explain why objects fall. Gravity is a force exerted by the Earth (and other large celestial objects) which pull objects towards their centre. It makes things fall based on their weight.	**Living Things** **Pupils should be taught to:** Describe the process of reproduction in some plants and animals. Some organisms reproduce sexually where offspring inherit characteristics / information from both parents Some organisms reproduce asexually by making a copy of a single parent Speak about the different life cycles of mammals, amphibians, insects and birds. Different types of organism have different life cycles Life cycles have evolved to help organisms survive into adulthood **Animals including Humans** **Pupils should be taught to:** Understand the stages of change as humans develop to old age. Humans are animals which reproduce sexually and characteristics are inherited from both parents A baby forms in the mother's womb over nine months. The sequence is baby – child – adolescent – adult – old age

	Stars produce vast amounts of heat and light. All other objects are lumps of rock, metal or ice and can be seen because they reflect this light. This is how we can track their movement. **Properties of Materials** **Pupils should be taught to:** Describe how dissolving, mixing and changes of state are reversible changes. Understand that some changes to materials, where new materials are formed, are not reversible, such as the burning or cooking of materials. Know that some materials will dissolve in liquid to form a solution, and I can describe how to recover a substance from a solution. Decide how mixtures might be separated, choosing from filtering, sieving and evaporating by looking at the materials that need to be separated. All matter (including gases) has mass Some mixed substances react to make a new substance. These changes are usually irreversible. Heating can sometimes causes materials to change permanently. When this happens a new substance is made. These changes are not reversible. Dissolving is a reversible change when a solid is dissolved in a liquid. This can be reversed by evaporating the water. Substances melt and evaporate at different temperatures change between solid, liquids and gases. Describe why some materials are used for a specific purpose, such as glass for windows or copper for wires. Group together everyday materials based their properties such as their hardness, solubility, transparency, conductivity (electrical and heat), and magnetism.		During adolescence the body undergoes many different changes. This should cover the difference between male and female changes. The development of the brain can continue right up until the age of 25.

	Understanding of the scientific terms they are sorting the materials by and how these properties make them suitable for certain uses		
Yr 6	**Light** Know light travels in straight lines. Light travels in straight lines Know we can see objects because the light from the object or reflected from the object travels into the eye. Be able to draw light lines from an object into the eye to show how we see. Animals see lights sources when light travels from the source into their eyes Animals see objects when light is reflected off that object into their eyes Be able to show that light causes shadows that are smaller or larger shapes of the original object. Light reflects off all objects (unless they are black). Non-shiny surfaces scatter the light so we do not see a single beam **Electricity** Be able to describe how a circuit functions, including the brightness of bulbs and the loudness of buzzers based on the way a circuit is built and the on/off position of switches. Know a lamp is brighter and a buzzer is louder if the voltage of battery used is higher. Batteries are a store of energy. This energy pushes electricity round the circuit. When the battery's energy is gone it stops. Voltage measures the push. The greater the current flowing through a device the harder it works Current is how much electricity if flowing around a circuit When current flows through wires heat is released.	**Living Things and their habitat** Be able to describe why I classify plants and animals in certain ways. Be able to describe the groups I classify living things into. **Evolution and Inheritance** Know that living things have babies but each baby is similar but not identical to their parents. Organisms reproduce and offspring have similar characteristics to their parents Variations exists within a population (and between offspring of same parents) Competition exists for resources and mates Organisms best suited to the environment are more likely to survive long enough to reproduce Organisms best adapted to reproduce are more likely to do so The 5 statements above work as a repeating cycle Understand that living things have changed over time and that fossils show us the types of animals that lived millions of years ago. Know that animals and plants have adapted or evolved to suit the environment they live in. Over time the characteristics that are most suited to the environment become increasingly common Environmental change can affect how well an animals is suited to environment Fossils provide evidence that living things have changed over time	**Animals Including humans** Be able to describe and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Know that good and bad diet, exercise, drugs and lifestyle all have an effect on how the body functions. Know how nutrients and water are transported within animals, including humans. The heart pumps blood around the body Oxygen is breathed into the lungs where it is absorbed into the blood Muscles need oxygen to release the energy from food to do work – oxygen goes into the blood in the lungs – the heart pumps blood around the body through blood vessels – the muscles take oxygen and nutrients from the blood to do their work.

	The greater the current the more heat is released. Be able to draw a circuit diagram using circuit symbols for lights, wires, switches and other parts. Understand the simple symbols for different circuit components (battery, bulb or lamp, buzzer, motor, open and closed switches)		

Key

Blue: topic being studied

Black: national curriculum

Purple: key ideas pupils must know to achieve objectives