SCIENCE: STICKY KNOWLEDGE

Foundation Stage	Physical Development	Understanding of the World	The Natural World
Working Scientifically • Make simple **predictions** about what they think might happen • **Observe** what is happening • **Communicate** about what and why something has happened • **Record** their results • **Ask** and **answer questions** • Carry out simple **tests** in a small group with an adult	**3-4 (Nursery)** • I can go to the toilet by myself. • I can wash and dry my hands. • I brush my teeth two times a day. • I can choose healthy foods to eat. • I know water is healthy to drink. **RECEPTION** • I know there are foods which keep my body healthy, like fruits and vegetables. • I need to look after my teeth and brush them twice a day and visit the dentist. • I can keep my body fit and healthy running, riding a bike and climbing. • I can cross the road safely, by looking both ways and staying with an adult. • I need to get a good night's sleep to help me concentrate. • I know 'screen time' should be a small amount of time.	**3-4 (Nursery)** • I can explore natural things by looking, smelling, touching, tasting and hearing. • I can see things that are the same and different in objects such as wood. • I can words to say/explain what I see. • I can plant seeds in soil and water them. • I know frogs start as frogspawn. • I know plants start as seeds. • I can show/tell you how to push and pull. • I can talk about materials, such as ice, melting and changing into water. **RECEPTION** • I can talk about what I see, hear and feel. • Some places look the same/different to where I live. • I can explore the natural world, looking at how things, such as trees, change outside at different times of the year. • I know there are different seasons. • In winter it is cold and there are no leaves on the trees. • In spring, seeds and plants grow. • In summer it is warmer than winter. • Autumn is when the leaves begin to fall off trees.	**ELG (Early Learning Goal)** • I can explore the natural world around me using all of my senses. • I can make observations and draw pictures of animals and plants. • I know some things are the same and some things are different in different environments. • I can tell you about what happens in the different seasons, spring summer, autumn and winter. • I can talk about some things that may change, such as ice to water, and tell you why.
STEM Sentences	• **Healthy** food helps our bodies grow strong. • **Unhealthy**_- food which are treats and not to be eaten too often. • **Dentist** is a place where you go to get your teeth checked. • **'Screen time'** - time spent on a computer/laptop/tablet/phone.	• **Similarities** are the same. • **Differences** are not the same. • **Exploring** is working thing out and learning about something using your senses. • **Senses** are what you use to explore things around you. We can see, hear, touch, taste, and smell.	• **Environments** are places where people or animals live. • **Spring** is a season where baby animals are born, and plants grow from seeds/bulbs. • **Summer** is when we have our warmest weather.

		• **Spring** is a season where baby animals are born, and plants grow from seeds/bulbs. • **Summer** is when we have our warmest weather. • **Autumn** is when the leaves start to fall from the trees. • **Winter** is very cold, and we need to wear warmer clothes.	• **Autumn** is when the leaves start to fall from the trees. • **Winter** is very cold, and we need to wear warm clothes. • **Senses** are what you use to explore things around you. We can see, hear, touch, taste and smell.

Year 1	Animals including Humans	Everyday Materials	Plants	Seasonal Changes
Working Scientifically • Use results to **ask and answer questions** • Make simple **predictions** with support. • Carry out simple **tests** in a small group • Take **measurements using** non-standard units. • **Record** and present **data** with support • **Interpret and communicate** why something has happened with support • **Evaluate** with support why something has happened	• There are five groups of common animals, fish, amphibians, reptiles, birds, and mammals. • A carnivore is an animal that eats meat. • Herbivores are animals that eat plants and omnivores eat plants and meat. • The five senses are: smell, touch, taste, hear and sight. • Parts of the human body have different names, head, shoulders, knees, toes, arms, legs etc.	• Objects are made from different materials: wood, plastic, glass, metal, water, and rock. • Materials have physical properties, some are hard, soft, smooth, rough, or transparent. • The physical properties of a material make it suitable for different objects.	• Flowering plants have features like roots, stem, leaves, and a flower. • Trees have four simple features: roots, trunk, branches, and leaves and/or fruit. • There are lots of wild and garden plants like daisies. • There are two types of trees, evergreen and deciduous. Deciduous trees lose their leaves. Evergreen trees are always green and do not lose their leaves.	• As seasons change so does the weather and the length of the day • There are four seasons: autumn, spring, summer, winter. • Air temperature changes across the seasons
STEM Sentences	• **Amphibians lay eggs** and have **moist wet skin** and **webbed feet**. • **Reptiles** have **dry, scaly skin.** • **Mammals** have **hair** or **fur.** • **Carnivores** are meat eating animals. • **Herbivores** are plant eating animals. • **Omnivores** eat meat and plants.	• **Transparent** objects you can clearly see through like glasses. • **Rough** objects have an **uneven surface** and are not **smooth.** • **Brittle** objects can be easily broken or shattered. • **Absorbent materials** soak up liquid easily. • **Objects** are made from different **materials** which all have **properties.**	• Flowering plants have **roots, stem**, **leaves**, and a **flower**. • Trees have **roots**, **trunk**, **branches**, and **leaves**. • **Deciduous** trees **shed** their leaves. • **Evergreen** trees have **needles** which do not fall off.	• In one year, there are four **seasons: autumn**, **spring**, **summer,** and **winter**. • It is lighter for longer in **summer** and **spring**. • There is less **daylight** in **autumn** and **winter**. • During **winter** and **autumn**, it gets darker earlier. • **Temperature** can be measured using a **thermometer** in **degrees Celsius**.

Year 2	Everyday Materials	Animals including Humans	Living things and their habitats	Plants
Working Scientifically • **Ask questions** and raise scientific questions with support • Make simple **predictions** independently • Plan **tests** deciding what to observe or measure • **Observe** and explain why something has happened • **Measure** using non-standard units • **Record data** in a group independently • **Interpret** and **communicate results** in a group • **Evaluate results** in a group	• Solid objects can change shape by squashing, bending, twisting, and stretching. • Different materials are suitable for different uses.	• Animals have offspring that grow. • All animals need shelter, water, food, and air to survive. • Animals can have different amounts of light and still survive. • It is important to eat the right amounts of different foods, there are 5 main food groups.	• Animals live in different habitats that meet their needs. • When a living tree dies it can be used for something else. • A simple food chain has a predator, prey, and a producer/ plant (energy)	• Seeds and bulbs germinate and grow into mature plants. • Plants need water, light and a suitable temperature to grow.
STEM Sentences	• **Translucent** objects you can see light through them, but not full shapes. • **Squashing** a material so that it is flat or changes shape. • If you **bend** a shape, it will change without breaking. • When you **twist** material it changes into a spiral shape,	• For **Survival** animals, plants and humans needs **water, air, food.** • **Reproduction** is when an adult creates a new version of itself. • **Offspring** is the **baby** of an **adult** animal or human. • A **kitten** is a baby cat. • A **calf** is a cow's offspring.	• A **habitat** is a place where a plant or animal lives. • A **microhabitat** is a small area within a habitat. • **Energy** is produced from food. • A **food chain** shows how **energy** is passed between plants and animals. • **Predators** hunt other animals to eat. • **Prey** is an animal who is eaten by another animal.	• The amount of heat of something is called **temperature**. • Growth is an increase in size. • The time when the seed begins to sprout is called **germination**. • **Reproduction** is when an animal or plants creates something like itself.

Year 3	Light	Animals including Humans	Rocks and soils	Magnets including forces	Plants
Working Scientifically • Ask relevant **questions** in a group • **Make predictions** about what might happen • **Carry out tests** deciding what to observe or measure • **Take measurements** using whole number standard units. • **Record data** and present data in bar charts • **Interpret and communicate** whether what has happened was expected or not • **Evaluate** and explain why something has happened	• Light allows humans to see things and dark is the absence of light. • Shadows are formed when the light from a light source is blocked by a solid object. • The further away an object is from the light source the shorter the shadow.	• Humans need the right number of different foods for nutrition. • Humans and other animals have skeletons that keep them upright. • Humans and other animals have skeletons and muscles for support, protection, and movement.	• Rocks can be compared and grouped together by looking at their appearance and properties. • Some rocks have grains, crystals, and layers. • Some rocks are light, and some are heavy. • Soils are made from rocks and organic matter. • Fossils are formed when living things are trapped in rocks.	• Magnets attract and repel each other. • Objects can be sorted into magnetic and non-magnetic.	• Plants have different parts which have specific functions. • Plants are needed for life and growth (air, light, water, nutrients from the soil). • Flowers are important in the life cycle. • Pollination is when pollen is transferred to produce seeds.
STEM Sentences	• **Light** travels in a straight line. • When light hits an object, it is **reflected** (bounces off). If the reflected light hits our eyes, we can see the object. • **Opaque** objects do not let any light through. • **Transparent** objects let light through. • **Translucent** allows some light to travel through, but not detailed shapes. • **Dark** is the absence of light.	• Living things need food to grow and to be strong and healthy. • Plants can make their own food, but animals cannot. • To stay healthy, humans need to exercise, eat a healthy diet and be hygienic. • Animals, including humans, need food, water and air to stay alive. Skeletons enable the body to stand up and protect vital organs.	• **Granite** is a rock with **crystals.** • **Pumice** is a rock with small holes. • **Sandstone** is a rock with layers. • **Chalk** is a **soft** white rock, but **Marble** is a hard white rock. • **Fossilisation** is the process that explains how a **fossil** is formed.	• **Forces** can make objects stop or start moving. • **Friction** is a force that holds back the movement of an object. • A **magnet** produces an area of magnetic force around itself, called a magnetic field. • The different parts of a magnet are called the poles. There is a **north pole** and a **south pole**.	• The **roots** absorb water and **nutrients,** the **stem** transports water and nutrients from the roots to the leaves. • The **leaves** produce its food. It needs sunlight and carbon dioxide. • The **flower** is bright to attract insects and birds. • **Pollination** occurs when pollen from the another is transferred to the stigma, often by an insect. • **Germination** is when a seed begins to grow.

					• **Pollen** joins with an ovule to form a seed. • The seed forms inside the **ovary**.

Year 4	Solids, Liquids and Gases	Sound	Classifying Animals and Habitats	Teeth and Digestion	Electricity

Working Scientifically					
• Ask relevant **questions** in a group, suggesting possible answers • **Make predictions** using scientific evidence • **Carry out tests,** identifying control variables with support • **Observe systematically and measure** using more complex standard units • **Record and present data** using bar charts where intervals and ranges are agreed as a class • **Interpret and communicate** about what has happened and explain why • Use results **to evaluate** and link back to predictions made	• Group and compare materials different materials. Solid materials keep their shape. Liquids run or flow, they take the shape of their container and are not rigid. • Gas matter can expand and flow, if gas is put in an unsealed container it can escape. • Condensation is a part in the water cycle where water vapour (a gas) turns back into a liquid. • Evaporation is when water is heated up, it changes state and becomes a gas called steam, this process is called evaporation.	• Sounds are made when objects vibrate, causing sound waves which enter the ear. • Sound waves are caused by vibrations in the air. • Pitch is how high or low a sound is. • Volume is how loud or quick a sound is.	• Living things can be grouped in a variety of ways based on their characteristics. • There are five vertebrate groups: fish, amphibians, reptiles, mammals, and birds. • Animals live in habitats which can change which poses risk to the animals who live there.	• Humans eat food which moves through the digestive system. • Digestion is how the body breaks down food. • Liquids There are seven main parts to the human digestive system: mouth, oesophagus, liver, stomach, large and small intestine, and rectum. • Children have 20 milk teeth and adults have 32 teeth. • Teeth have different names and are used for different functions.	• A simple circuit has cells, wires, bulbs, switches, and buzzers. • If a circuit is complete, it will be able to light up a bulb. • A switch opens and closes a circuit. • Conductors allow electricity to pass through e.g metal. • Insulators do not allow electricity to pass through e.g wood.
STEM Sentences	• **Solids** are objects that have a fixed shape. • **Liquids** are fluids that can change shape when poured but have the same volume. • **Gases** are substances that have no fixed size or shape. • **Particles** are the smallest possible units of matter. • **Evaporation** is when a liquid heats up to become a gas.	• **Pitch** is how high or low a sound is. • **Volume** is how loud or quiet a sound is. • Sounds travel to my ears through **vibrations**. • I hear sounds because **sound waves** are a **vibration.** • The **source** is where a sound comes from.	• **Vertebrates** are animals that have a backbone (mammals, fish,reptiles, birds, amphibians) • **Invertebrates** are animals that do not have a backbone (snails, slugs,worms, spiders, insects). • **Environment** is the surroundings in which an animal or plant lives its life. • A **Habitat** is the place where an organism makes its home.	• An **oesophagus** is a tube that moves food from the mouth to the stomach. • A **stomach** is an organ that receives food and digests it. • The **small and large intestine** absorbs nutrients and water. • **Canines** are the teeth at the front of the mouth which chop food. **Incisors** are sharper teeth that tear food.	• **Batteries** are used to give power to many things. • A **cell** is a device that makes electricity using chemicals. • A **bulb** is made of glass and uses electricity to make light. • A **switch** opens and closes an electrical circuit. • A **circuit** is a closed path for electricity to travel through. • A **conductor** lets electricity pass through. • An **insulator** does not let electricity pass through.

	• **Condensation** is when a gas cools to become a liquid. • **Freezing** is when a liquid cools to become a solid. • **Melting** is when a solid is heated to become a liquid.			• **Pre-molars and molars** are teeth at the back of the mouth that grind food.	

Year 5	Changing Materials	Forces	Earth and Space	Living things and their habitats	Human Changes
Working Scientifically • Use and ask scientific **questions** to investigate • **Make predictions** thinking about scientific evidence • Choose **tests** that will provide the best enquiry or evidence • **Observe and measure** discussing when to take repeat readings • **Record** and **present data** in a variety of ways • **Interpret and communicate results** • **Evaluate** an investigation by suggesting improvements	• Some materials dissolve when mixed with a liquid- these are soluble. If they do not dissolve, they are insoluble. • When a soluble is dissolved in a liquid a solution is created. • Dissolving is a reversible change. • Some changes are irreversible such as when an egg is cooked it cannot be reversed. • There are different ways to separate a mixture of materials, including: sieving, magnetism, evaporation and filtration.	• Gravity is a force that pulls everything down towards the centre of the Earth. • Unsupported objects fall towards the earth because of gravity. • Air resistance, water resistance and friction act between moving surfaces. • Mechanisms like levers, pulleys and gears allow a smaller force to have a greater effect.	• The Earth and other planets in the solar system orbit the sun. • The Moon orbits the Earth. • The Earth rotates on its axis once every 24 hours. • When the half of the Earth is facing the sun, it is daytime. When the Earth faces away it is night-time.	• Life cycles in mammals, amphibians, birds, and insects vary. • Asexual reproduction requires just one parents and produces identical offspring e.g. plants and snails. • Sexual reproduction requires two parents which creates offspring that are similar but not identical to the parents. • Metamorphosis is a process where the structure of an animal's body undergoes an obvious change.	• The human body changes during puberty to be ready for sexual reproduction. • Humans change and develop to old age.
STEM Sentences	• A **soluble** material dissolves in liquid.	• A **Newton** is the unit of measurement used to measure force.	• The **Sun** is a huge star that Earth and the other planets in our	• A **mammal** is an animal that breathes air, has a backbone, and grows hair	• The cycle of a human goes **foetus, baby,**

	• When a substance **dissolves** it mixes with a liquid to make a transparent liquid called a **solution.** • A material that heat or electricity can travel through is a **conductor.** • An **insulator** is a material that does not let heat or electricity travel through it. • **Filtration** is used for separating a solid and a liquid. • When a liquid is turned into a gas or vapour this is **evaporation.** • **Sieving** is used to separate two solids. • A **reversible** change can get the original materials back. • An **irreversible** change cannot be reversed to its original state.	• **Gravity** is a pulling force exerted by the Earth. • **Air resistance** is a type of friction caused by air pushing against any moving object. • **Water resistance** is a type of friction caused by water pushing against any moving object. • **Friction** is a force that acts between two surfaces or objects that are moving, or trying to move, across each other.	solar system orbit around. • The **Moon** is a natural satellite which orbits Earth or other planets. • The **Axis** is an imaginary line that a body rotates around. • **Rotation** is to spin. • A **star** is a giant ball of gas held together by its own gravity. • A **constellation** is a group of visible stars that form a pattern when viewed from Earth.	at some point during its life. • An **insect** is an invertebrate that has an exoskeleton and a segmented body. • An **amphibian** is a vertebrate animal that can live both in fresh water and on land. • **Sexual reproduction** is when two parents are needed to make offspring which are similar but not identical to either parent. • **Asexual reproduction** needs one parent to create an offspring, which is an exact copy of the parent. • **Fertilisation** is the action of fusing the male and female sex cells to develop an egg.	**toddler, teenager, adult,** and **elderly.** • An **embryo** develops into a **foetus** in the womb, this is called **gestation.** • **Puberty** is when the body changes in readiness for future reproduction.

Year 6	Light	Electricity	Living Things	Animals including Humans	Evolution and Inheritance

Working Scientifically • **Ask and generate questions** concerning fair testing • **Make predictions** and recognise when scientific evidence supports an idea or not • Use test results to **make predictions** for further tests and explain why • When **carrying out tests** recognise variables when selecting an investigation • **Observe** and recognise differences in repeated **measurements or observations.** • **Record data** independently using scatter, bar, and line graphs • **Interpret and communicate** data to be presented. • **Evaluate** by comparing their results with others. • **Evaluate** when scientific evidence supports an idea or not	• Light travels in straight lines. • Objects are seen because they give out light or reflect light into our eyes. • Shadows have the same shape as the objects that cast them.	• The number of cells (voltage) affects the brightness of the bulb or the volume of a buzzer. • The higher the voltage the louder the buzzer. • A simple circuit can be drawn in a diagram using recognised symbols.	• Living things can be classified into four broad groups: invertebrates, vertebrates, plants, and micro-organisms. These groups are further sub-divided. • We can identify an unknown plant or species using their characteristics.	• Humans have a circulatory system. • The heart is a muscle that pumps blood around the body delivering oxygen. • Blood has four different components: red blood cells, white blood cells, platelets, and plasma. • The way our body's function is affected by factors such as drugs, alcohol, exercise, and lifestyle.	• All living things have evolved over time (millions of years) from single-cell organisms. • Some characteristics are inherited, some characteristics are acquired. • Animals and plants have adopted to suit their environments and habitats.
STEM Sentences	• **Refraction** is the bending of light whereas **reflection** is the throwing back of light from a surface. • A **shadow** is a dark are or space coming between a light source and an object.	• A **switch** is a device to make or break an electrical circuit. • A **conductor** is a material which allows an electrical current to flow through it. • An **insulator** is a material through which an electrical current cannot flow freely.	• A **vertebrate** is an animal of a large group distinguishes by the presence of a backbone. • An **invertebrate** is an animal lacking a backbone. • **Classification** is the arrangement of plants and animals according	• **The circulatory system** is inside the body and consists of **blood, blood vessels** and the **heart.** • **Veins** carry oxygen depleted blood towards the heart. • **Arteries** carry oxygenated blood from the heart to other parts of the body.	• **Adaptation** is a process of change by which a species or organism changes to become better suited to its environment. • **Natural selection** is a mechanism of evolution: organisms more adaptive to their environments are the most likely to survive.

			to their observed characteristics.		