Science Knowledge and Vocabulary Routeway

National Curriculum Requirements

The national curriculum for science aims to ensure that all pupils:

By the end of Key Stage 1

Working scientifically

The pupil can, using appropriate scientific language from the national curriculum:

- ask their own questions about what they notice
- use different types of scientific enquiry to gather and record data, using simple equipment where appropriate, to answer questions: ▪ observing changes over time
▪ noticing patterns
▪ grouping and classifying things
▪ carrying out simple comparative tests
▪ finding things out using secondary sources of information
- communicate their ideas, what they do and what they find out in a variety of ways.

Science content

The pupil can:

- name and locate parts of the human body, including those related to the senses [year 1], and describe the importance of exercise, a balanced diet and hygiene for humans [year 2]
- describe the basic needs of animals for survival and the main changes as young animals, including humans, grow into adults [year 2]
- describe the basic needs of plants for survival and the impact of changing these and the main changes as seeds and bulbs grow into mature plants [year 2]
- identify whether things are alive, dead or have never lived [year 2]
- describe and compare the observable features of animals from a range of groups [year 1]
- group animals according to what they eat [year 1], describe how animals get their food from other animals and/or from plants, and use simple food chains to describe these relationships [year 2]
- describe seasonal changes [year 1]
- name different plants and animals and describe how they are suited to different habitats [year 2]
- distinguish objects from materials, describe their properties, identify and group everyday materials [year 1] and compare their suitability for different uses [year 2]

By the end of Key Stage 2

Working scientifically

The pupil can, using appropriate scientific language from the national curriculum:

- describe and evaluate their own and others' scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources
- ask their own questions about the scientific phenomena that they are studying, and select the most appropriate ways to answer these questions, recognising and controlling variables where necessary (i.e. observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, and finding things out using a wide range of secondary sources)

• use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate
• record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
• draw conclusions, explain and evaluate their methods and findings, communicating these in a variety of ways • raise further questions that could be investigated, based on their data and observations.

Science Content

The pupil can:

• name and describe the functions of the main parts of the digestive (year 4), musculoskeletal (year 3) and circulatory systems (year 6); and describe and compare different reproductive processes and life cycles in animals (year 5)
• describe the effects of diet, exercise, drugs and lifestyle on how the body functions (year 6)
• name, locate and describe the functions of the main parts of plants, including those involved in reproduction (year 5) and transporting water and nutrients (year 3)
• use the observable features of plants, animals and microorganisms to group, classify and identify them into broad groups, using keys or other methods (year 6)
• construct and interpret food chains (year 4)
• describe the requirements of plants for life and growth (year 3); and explain how environmental changes may have an impact on living things (year 4)
• use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved (year 6); and describe how fossils are formed (year 3) and provide evidence for evolution (year 6)
• group and identify materials (year 5), including rocks (year 3), in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties (year 5)
• describe the characteristics of different states of matter and group materials on this basis; and describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle (year 4)
• identify and describe what happens when dissolving occurs in everyday situations; and describe how to separate mixtures and solutions into their components (year 5)
• identify, with reasons, whether changes in materials are reversible or not (year 5)
• use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects (year 6), and the formation (year 3), shape (year 6) and size of shadows (year 3)
• use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard (year 4)
• describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source (year 4)
• describe the effects of simple forces that involve contact (air and water resistance, friction) (year 5), that act at a distance (magnetic forces, including those between like and unlike magnetic poles) (year 3), and gravity (year 5)
• identify simple mechanisms, including levers, gears and pulleys, that increase the effect of a force (year 5)
• use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it; and use recognised symbols to represent simple series circuit diagrams (year 6)
• describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system; and explain the apparent movement of the sun across the sky in terms of the Earth's rotation and that this results in day and night (year 5)

EYFS	Milestone 1	Milestone 2	Milestone 3	Milestone 4	Milestone 5	Milestone 6	Early Learning Goal
	Can say who they are and who they live with	Can talk about who/what is special to them e.g. nanny, dog	Can briefly talk about some members of their family	Sequences family members, explaining who they are (child, adult, elderly)	Can describe some family memories	Notices and celebrate things they can do now that they could not do when they started school	Has an understanding of change within living memory – people
	Shows an awareness of the roles of the people in my learning space. Key Worker Teacher Dinner Staff	Shows an interest in occupations they know about from their school environment: Headteacher Admin Staff Kitchen Staff Site Officer		Can talk about what a job (occupation) is. Know that you get paid for a job.	Can identify the role of the emergency services and talk about a wide range of occupations. Fire engine visit GP Know how to call for help.	Can talk about their aspirations for their own role in society Scientist – e.g Greta Thunberg	Understands similarities and differences between people
The Natural World	Uses their senses to explore the natural environment Knows the names of some animals through nursery rhymes and stories.	Explores the natural environment and begin, with support, to guide them to share what they can hear and see.	Explores the natural environment and can share what they can see and hear.	Explores the natural environment. Describes it using their senses.	Compare two contrasting environments. E.g school and holiday destination. Identify what is different e.g weather, sea Talks about the features of their own immediate environment and how environments might vary from one another e.g Hot V Cold (Henry's Holiday)	Explores the natural world around them, compare how it has changed since Autumn. e.g flowers in bloom, leaves on trees and insects. (Bug hunt) Can talk about a life cycles a butterfly Has developed an understanding of the effect their behaviour can have on the environment (link to Greta)	Explores the world around them and raises own questions
	With adult support, begins observe about weather	With adult support, describe the weather e.g sunny, cloudy, cold, wet, rain	Talk about weather independently, in a simple sentence.	Beginning to observe and interact with natural processes- e.g. changing weather	Begin to observe changing states of matter e.g. freezing, melting (link to seasons	Understands the effect of changing seasons on the natural world, including similarities and differences	Identifies differences, similarities or changes related to

			e.g It is sunny and hot.	**e.g. discussions about the weather.**	**ice/weather/ winter walk)**	**e.g compare two days across the year, using floor book.**	**simple scientific ideas and processes**
	Experiences forces e.g Moving scooter and bikes Rolling a hoola hoop Rolling a ball	**Explores forces and uses new vocabulary to describe them e.g Pushing and pulling.**	**Name common materials e.g Wood, plastic, paper.**	**Observe and describe that things can speed up and slow down.**	**Observes that a magnet can attract and repel. Know and identify what floating and sinking is.**	**Observes the natural process of light casting a shadow Know how to make something sink**	**Identifies differences, similarities or changes related to simple scientific ideas and processes**

<table>
<tr><th>Year Group</th><th>Autumn</th><th>Spring</th><th>Summer</th></tr>
<tr><td>Year 1</td>
<td><u>Autumn 1- Everyday Materials</u>

<u>Scientific Discipline: Chemistry</u>

<u>Knowledge</u>
• Distinguish between an object and the material from which it is made.

Know that solids include glass, plastic and stone.

Know that liquids include water, blood, milk.

Know that gas includes air that we breathe

Know that all objects are made of one or more materials.

Know that some objects can be made from different materials e.g. plastic, metal or wooden spoons.</td>
<td><u>Spring 1- Animals and habitats</u>
<u>Scientific Discipline: Biology</u>

<u>Knowledge</u>
• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals

Know that animals can be grouped.
Know that vertebrates have internal skeletons.)

<table>
<tr><td>Mammals</td><td>Fish</td><td>Bird</td><td>Reptile</td><td>Amphibian</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td><u>Animals in Coventry</u>

Mouse
Fox</td><td><u>Animals in Coventry</u>

Carp</td><td><u>Animals in Coventry</u></td><td><u>Animals in Coventry</u>

Adder</td><td><u>Animals in Coventry</u>

Common Toad</td></tr>
</table>
</td>
<td><u>Summer 1- Plants</u>
<u>Scientific Discipline: Biology</u>

<u>Knowledge</u>
• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.

Know that a plant is an organism (a living thing)

Know that natural means to be produced by nature and not by humans

Know that plants can grow in many types of places, including on land or in water

Know that some plants produce fruit, and some produce flowers</td></tr>
</table>

	• **Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.** Know that some materials are natural and others are man-made. Know that natural materials come from materials found in nature and man-made materials are those which humans make. Know natural materials: iron, gold, silver, silk, cotton, leather, wood, water and rock. (know that iron, gold, silver are collectively known as metals) Know man-made materials: plastic, glass (know that glass is heated sand), brick, paper, concrete, rubber and some metals like steel. • **Describe the simple physical properties of a variety of everyday materials.** Know that materials can be described by their properties e.g. shiny, stretchy, rough etc. Know the history of John Dunlop the inventor of pneumatic tyre. • **Compare and group together a variety of everyday materials on the basis of their simple physical properties.** Know that some materials e.g. plastic can be in different forms with very different properties <u>Vocabulary and Definitions</u> Object – anything that can been seen or touched.	<table><tr><td>Badger Squirrel Hedgehog <u>Wider World</u> Elephant Tiger Gorilla Giraffe Camel Zebra</td><td>Stickle back <u>Wider World</u> Salmon Tuna Shark</td><td>House Sparrow Starling Magpie Robin Blackbird <u>Wider World</u> Flamingo Pelican Emu Parrot</td><td>Grass Snake Slow Worm <u>Wider World</u> Iguana Chamaeleon Crocodile Boa Constrictor</td><td>Common Frog Smooth Newt <u>Wider World</u> Poison Dart Frog</td></tr></table> • **Identify and name a variety of common animals that are carnivores, herbivores and omnivores** Know that a carnivore eats meat- **cat**. Know that **carnivores** have sharp **teeth**. Know that herbivores eat **plants. Rabbits** Know that an **omnivores** eats meat and plants. **Humans)** • **Describe and compare the structure of a variety of common animals** Know what makes a pet different to a wild animal. Know what is needed to look after a pet. Know the Features of a fish: **gills, scales,fins**, water dwelling.	Know the names of the following common trees - oak, elm, maple, silver birch, sycamore, horse chestnut, willow Know how to describe some of the key features of these trees and plants e.g. the shape of the leaves, the colour of the flower/blossom Know that plants have common parts, but they vary between the different types of plants. Know that some trees keep their leaves all year. Know that oak, birch and sycamore are deciduous Know that these trees are called evergreens. Know that holly and pine are evergreen Know that other trees drop their leaves during autumn and grow them again during spring. Know that this is a deciduous tree. Know that garden plants often need humans to help them fully grow Know how to identify the following common garden plants: • rose • Tulip • poppy Know that a wild plant is one which grows naturally Know the name of trees and other plants that they see regularly - daisy, white clover, poppy, nettle, ivy, bramble and locate some in the local environment. (also dandelion and grass)

Material - A material is any substance that an object is made from.
Wood
Plastic
Glass
Metal
Water
Rock
Brick
Paper
Fabric
Elastic
Foil
card/cardboard
rubber
wool
clay
Hard – difficult to break. Solid to touch.
Soft - easy to bend or to shape; not firm or hard.
Stretchy- extend or lengthen something
stiff (rigid) - not easily bent
Bendy – soft and flexible
Floppy
Waterproof –something that keeps water out.
Absorbent - a material that soaks up liquid or moisture
breaks/tears
rough
smooth
shiny
dull
see-through (transparent) -
not see-through (opaque) -

Autumn 2- Seasons Autumn and Winter
Scientific Discipline:

Know the features of mammals: hair or fur, live young, **offspring** drink milk, live on land or water.
Know the features of amphibians' **habitat** is land or water when adults, soft skin, lay eggs in water, habitat is water when young.
Know the features of reptiles: dry **scaly** skin, lay **eggs** on land.
Know the features of birds: **wings,** feathers, **beak/bill**, hatch from eggs, most can fly (not **ostrich**, penguin, kiwi).

- **Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.**

Know that we have 5 senses- smell, tast, touch, sight, hearing.
Know that the following body parts are linked to senses:

Sense	Part of the Body
Sight	Eyes
Smell	Nose
Touch	Hands feet arms legs etc
Hearing	Ears
taste	tongue

Know the following parts of the body:

• Identify and describe the basic structure of a variety of common flowering plants, including trees.

Know the names of the basic parts of a plant and their describe structure - leaves, flower, stem, roots, petals

Part	function
leaves	collect energy from the sun to help the plant grow
flower	creates seeds
stem	holds the flower and leaves up high and transports water
root	collects nutrients and water from the soil to help the plant grow
petal	the coloured part of a flower that attracts insects

Know how to draw a diagram showing the parts of a plant Know the names and function of parts of a tree - roots, trunk, branches, leaves.
Know that a tree trunk is a type of stem.
Know that flowers on a tree are often called blossom.
Know that fruit often grows on trees including - apples, oranges, cherries, lemons, bananas, mangoes, pears and plums.
Know that the fleshy part of the fruit generally protects the seeds within.
Recognise examples of seeds and pips found in apples, oranges, peaches and cherries.
Know how to record observations about the roots and stem growing.

Vocabulary and Definitions

	Observe changes across the four seasons. Know that a season is a time of year, and each season has its own temperature and weather patterns Know there are four seasons that in the UK: 1. spring 2. summer 3. autumn 4. winter Know that the seasons repeat and we go through each season every year Know that where we live, the following can be considered as each season: 1. autumn: September – November 2. winter: December – February 3. spring: March – May 4. summer: June - August • **Observe and describe weather associated with the seasons and how day length varies.** Can describe days as being longer (in time) in the summer and shorter in the winter Know that in the UK, the day length is longest at mid-summer (about 16 hours) Know that day length gets shorter each day until mid-winter (about 8 hours) before getting longer again.	Know that the **brain** controls the body. Know the rhyme head shoulders knees and toes) <u>Vocabulary and Definitions</u> Body Parts: Head Body Eyes Ears mouth teeth Leg Bird body parts: tail wing claw feathers beak Mammal body parts: fur paws hooves Fish body parts: fin scales The senses: sight smell touch hearing taste Egg- **An egg is an oval object that is produced by a female bird and which contains a baby** Offspring- children or young of a particular parent. Habitat –the place where living things naturally live and grow. Vertebrate - backbone Carnivore – a diet of only meat.	Leaf - A leaf is a part of a plant. It's attached to a stem or branch and can come in many shapes and sizes. One of their main jobs is to help the plant to collect sunlight Flower- part of a plant that is sometimes called the bloom or the blossom. It plays a big role in the reproductive process - it produces seeds and can vary in appearance and smell. Blossom - he flowering part of a plant or tree that will form the seeds or fruit Petal- a coloured part of a flower Fruit- the part of a flowering plant that contains the seeds Berry- small, fleshy fruits that usually have many seeds Root- part of a plant that is usually hidden underground. They hold the plant in the ground and keep it upright. They take water and food from the soil. Seed- the small parts produced by plants from which new plants grow. Trunk - he main stem of a tree apart from branches or roots Branch - a woody part of a tree or bush that grows out from the trunk Stem- he main part of a plant that grows up from the ground and supports the branches, leaves, flowers, or fruits that may grow from it Bark- Bark is the outer layer of the trunk of a tree

	Know that weather refers to the temperature outside, the wind, clouds and rain/snow Know that the weather also changes with the seasons. Know that in the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. Know that we measure temperature in the UK using Celsius Know that autumn is when the weather begins to get cooler and leaves start to fall off of some trees Know that winter is the coldest season Know that in winter it can snow and is cold enough to leave frost on the ground Know that winter has the least amount of daylight, meaning the days are shorter and nights are longer Know how to describe characteristics of autumn and winter using photographs Know that the change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people. Know that a rain gauge is an instrument used to gather and measure the amount of rainfall	Omnivore –a diet of plants and meat. Herbivore- a diet of only plants **<u>Spring 2 Seasons-Spring and summer</u>** **<u>Scientific Discipline:</u>** **• Observe changes across the four seasons.** Know that a season is a time of year, and each season has its own temperature and weather patterns Know there are four seasons that in the UK: 5. spring 6. summer 7. autumn 8. winter Know that the seasons repeat and we go through each season every year Know that where we live, the following can be considered as each season: 5. autumn: September – November 6. winter: December – February 7. spring: March – May 8. summer: June - August **• Observe and describe weather associated with the seasons and how day length varies.** Can describe days as being longer (in time) in the summer and shorter in the winter Know that in the UK, the day length is longest at mid-summer (about 16 hours) Know that day length gets shorter each day until mid-winter (about 8 hours) before getting longer again. Know that weather refers to the temperature outside, the wind, clouds and rain/snow	Bud- small pointed lump that appears on a tree or plant and develops into a leaf or flower **<u>Summer 2: Seasons</u>** **<u>Scientific Discipline:</u>** **• Observe changes across the four seasons.** Know the four seasons: spring, summer, autumn, winter Know when the four season occur in the UK. **• Observe and describe weather associated with the seasons and how day length varies.** Can describe days as being longer (in time) in the summer and shorter in the winter Know that in the UK, the day length is longest at mid-summer (about 16 hours) Know that day length gets shorter each day until mid-winter (about 8 hours) before getting longer again. Know that the weather also changes with the seasons. Know that in the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. Know that he change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people. **<u>Vocabulary and definitions</u>** Weather (sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn) Sun Sunrise apparent rising of the sun above the horizon

	Know how to measure the amount of rainfall using a rain gauge **<u>Vocabulary and definitions</u>** Weather (sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn) Sun Sunrise apparent rising of the sun above the horizon Sunset he apparent sinking of the sun below the horizon day length – the time between sunsrise and sunset.	Know that the weather also changes with the seasons. Know that in the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. Know that we measure temperature in the UK using Celsius Know that spring is when the weather begins to get warmer and blossoms appears on some plants Know that summer is the warmest time of the year Know that summer days have the most amount of daylight, meaning the days are longer and the nights are shorter Know how to describe characteristics of spring and summer using photographs Know that the change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people. Know that a rain gauge is an instrument used to gather and measure the amount of rainfall Know how to measure the amount of rainfall using a rain gauge **<u>Vocabulary and definitions</u>** Weather (sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn) Sunrise apparent rising of the sun above the horizon	Sunset he apparent sinking of the sun below the horizon day length – the time between sunsrise and sunset. **<u>Electricity</u>** **<u>Scientific Discipline: Physics</u>** • **Identify common appliances that run on electricity** Know that many household devices and appliances run on electricity. Know that some plug in to the mains and others run on batteries. Identify the hazards that might be faced in the home. 1. Overloaded plug extension sockets, 2. Exposed wires, 3. Damaged sockets, 4. Wires left along the carpet for people to trip over, 5. Electrical appliances and wires near water, 6. Placing metal into electrical appliances or open sockets,

<table>
<tr>
<td></td>
<td></td>
<td>Sunset he apparent sinking of the sun below the horizon

day length – the time between sunsrise and sunset.</td>
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<tr>
<td>Year 2</td>
<td><u>Autumn 1- Movement</u>

<u>Scientific Discipline: Biology</u>

<u>Knowledge and Skills</u>
• compare how things move on different surfaces.

Know that resistance is ‘a force which slows down a moving object’.

Know that when objects move across a surface there is friction when they rub against each other and that sometimes this friction is larger or smaller.

Know that the smoother the surface of the material, the less resistance it has and will travel further.

Know that the rougher the surface, the more resistance it has and the less it will travel.

• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</td>
<td><u>Spring 1- Animals Including Humans & Healthy Eating</u>
<u>Scientific Discipline: Biology</u>

<u>Knowledge and Skills</u>
• Noticing that animals, including humans, have offspring which grow into adults

Know that all animals, including humans, change and grow as they get older
Know that animals, including humans, have offspring, which grow into adults
Know the following animals, their offspring and identify them in photos:
<table><tr><td>Dog,puppy
Cat,kitten
Horse, foal
Bear,cub</td><td>Bird,chick
Cow,calf
Pig,piglet
Goat,kid</td><td>Duck,duckling
Lion,cub
Sheep,lamb</td></tr></table>Name animals that hatch from an egg and those that are born as live young.

<table><tr><td>Hatch from Egg</td><td>Live Young</td></tr><tr><td>Chicken
Snake
Crocodile
Frogs</td><td>Cow
Pig
Human
Horse</td></tr></table></td>
<td><u>Summer 1- Plants</u>
<u>Scientific Discipline: Biology</u>

<u>Knowledge</u>
• Observe and describe how seeds and bulbs grow into mature plants.

Know the names of common trees and plants from Y1 curriculum (see below)
Plants - daisy, white clover, poppy, nettle, ivy, bramble, dandelion and grass and introduce new species daffodils, roses, thistle and shamrock (all UK national flowers)
Trees - oak, elm, maple, silver birch, sycamore, horse chestnut, crack willow
Know how to use the term species to describe different plants.

Know that plants may grow from either seeds or bulbs.</td>
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</table>

	Know that applying forces to objects can change their shape Know that objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. Know that clay can be shaped by squashing, stretching, rolling, pressing etc. Know that bending, stretching, squashing and twisting can be a property of the material or depend on how the material has been processed e.g. thickness. Know how to describe the action used to change the shape of an object. Know that materials can change shape when properties are flexible and soft. Know that materials can't change shape when the properties are rigid, hard and stiff. **Vocabulary and Definitions** Shape, push/pushing pull/pulling twist/twisting squash/squashing bend/bending stretch/stretching **Autumn 2- Everyday Materials** **Scientific Discipline: Chemistry** **Knowledge**	<table><tr><td>Toads Snails Robin</td><td>Bear Sheep</td></tr></table> Know that live **offspring** resemble their parents and that they require milk from their mothers. Know that some offspring do not resemble their parents - tadpoles Know that the different stages of a human life cycle include: 1. baby: grows inside its mother; needs an adult to take care of them 2. toddler: learns to walk and talk; still needs looking after 3. children: 3-12; learning new skills 4. teenager: 13-19 5. adult: fully-grown; can have offspring Know how to begin to describe growth/changes between different stages of a human life (e.g. learning to speak and walk, growing taller) Know that basic life cycle stages of at least two other animals: 1.chicken: egg, chick, chicken 2. butterfly: egg, caterpillar, pupa butterfly frog: spawn, tadpole, frog Know how to compare the life cycle of other animals to the life cycle of a human (including the fact that all grow and change as they get older) • **Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).** Know that the basic needs of humans include: 1.water and food (for energy) 2. oxygen (to breathe) 3. shelter (for protection from weather, such as rain and cold temperature)	Know that seeds germinate and grow into seedlings which then continue to grow into mature plants Know that a shoot is a new part of a plant that grows Know that seeds and bulbs have a store of food inside them Know that seeds are sown and bulbs are planted. Know that mature plants may have flowers which then develop into seeds, berries, fruits etc. Know that seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. 1. Know the basic stages of a plant's life cycle: 2. seeds or bulbs are planted by humans, animals or blown by the wind 3. germination (the growth of a plant within a seed) 4. roots grow below ground to collect water 5. shoots grow above ground for light 6. seeds from the plant are spread and cycle begins again

	• **Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.** Know the name of an object, say what material it is made from. Identify an object's properties and make a link between the properties and a particular use . Know that a chair can be made of wood because wood is strong and rigid. Know that plastic would also be good for a chair because it is strong, flexible and smooth. Know that glass is a good material for a window because it is transparent and rigid. Know that fabric would be a good material for a jumper because it is flexible, soft and strong. Know how to label a picture or diagram of an object made from different materials. Identify what properties a suitable material needs to have for a specific object. Know that a material can be suitable for different purposes and an object can be made of different materials. **<u>Vocabulary and Definitions</u>** Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard Properties of materials – as for Year 1 plus Opaque - cannot be seen through and does not allow light to pass through it.	Know how to compare the basic needs of humans to some basic needs of other animals • **Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.** Know that a diet refers to what you eat and drink Know that different types of foods do different things for our bodies, so we should eat a balanced diet of different types of foods Know that a balances diet contains 5 food groups: **sugars & fats, carbohydrates, protein, Fruit and Veg, dairy**. Know how to begin to recognise some different types of food: 1.fruit and vegetables: we should eat lots each day .Know that fruit and veg give us **vitamins and minerals**. Know that fruit and veg give us fibre which is needed for **digestion.** 2.carbohydrates: give us energy (e.g. bread, pasta) 3.protein: help our muscles (e.g. meat, beans) 4. sugar: we should only eat a small amount (sweets, cakes) 5. D**airy** products contain **calcium**. Know that calcium is needed for healthy **teeth** and **bones**. Know how to plan a healthy meal, beginning to use correct terminology Know that exercise is anything which makes your body work hard (e.g. running or riding a bike) Know how to identify different forms of exercise that they do: running, swimming, skipping, yoga.	**• Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.** Know that seeds need the following to germinate - ● Water ● Oxygen ● Warmth Know that plants need the following to grow and be healthy - ● Water ● Air ● Warmth ● Light ● Nutrients ('food' absorbed by the roots) Know that roots support the plant in the ground and absorb water and nutrients needed for growth. Know that nutrients are substances that help plants and animals to grow. Know that the stem holds the flower and leaves up to the sunlight and carries water and nutrients to the leaves. Know that leaves are made to catch sunlight and change the sun's energy into energy for the plant to use to grow. Know that the flower is where seeds are made.

transparent - light completely passes through it, and you can see clearly through it.

translucent letting only some light through so that what can be seen on the other side is not clear

reflective - heat, light, or an image that bounces off an object or surface

non-reflective - not capable of or not designed to reflect light.

Flexible - object or material can be bent easily without breaking

rigid - difficult or impossible to bend; stiff

Brittle - An object or substance that is brittle is hard but easily broken.

Know that exercise is an important part of staying healthy and it works your muscles and makes you stronger

Know that when you exercise, you use up energy (which comes from what you eat)

Know how exercise affects the body: **muscles, heart, circulation, strength, mental health.**

Know that the **heart pumps blood** around the body.

Know that **lungs** enable humans to **breathe**.

Know how to perform different simple exercises and comment on how it makes them feel

Fruit & Veg	Sugars and Fats	Carbohydrates	Dairy	Protein
Grapes Oranges Banana Broccoli Beans Cauliflower	Cake, chocolate, biscuit,	Bread Rice Potatoes Pasta	Milk cheese yoghurts	Meat Fish Eggs beans

Know that **germ** is a microorganism.

Know that a **microorganism** is a very small living thing seen only under **microscope**.

Know that a germ can be **bacteria** or a **virus**.

Know that germs have potentially to harm humans.

Know how to stop spread of germs through hygienic actions.

Vocabulary and Definitions

Know that some plants are better suited to growing in full sun.

Know that some plants grow better in partial or full shade.

Know that plants also need different amounts of water and space to grow well and stay healthy.

Know how to compare the basic needs of a plant to a human

Know how to describe and record changes to a seed over time as it grows, using accurate terminology of plant parts (e.g. stem, leaves)

Vocabulary and Definitions

Light **form of energy which our sense of sight can detect**.

Shade –partial darkness caused by an opaque object blocking light rays.

Sun - the **star at the center of the solar system**

Warm – having or giving off heat.

Cool – low temperature.

Water - a colourless, transparent, odourless liquid that forms the seas, lakes, rivers, and rain

		Infancy - **is the period of your life when you are a very young child** Childhood – being a child Adolescence - **phase of life between childhood and adulthood, from ages 10 to 19** Bacteria – small living thing not able to be seen by the naked eye. Virus – a very tiny type of germ. Microorganism- living thing too small to be seen by the naked eye. Digestion- the process by which food and drink are broken down into smaller parts so that the body can use them to build and nourish cells and to provide energy. Carbohydrate – main source of energy for a person's body. Sugar – a carbohydrate found in plants. **<u>Spring 2- Living Things & Habitats</u>** **<u>Scientific Discipline: Biology</u>** **<u>Knowledge</u>** ● explore and compare the differences between things that are living, dead, and things that have never been alive (To know and group the following items: Alive: Human, Tree, Bird, Fish Dead: Bunch of flowers, Twig, Paper Never Alive: Plastic Bag, Metal Coin, The Sun	Space – empty/unoccupied area. Grow – to develop to maturity. Healthy - in a good physical or mental condition Bulb - a **bulb** is the name given to the underground bud or stem of a seed plant at resting stage. Bulbs normally have a sort stem with fleshy leaves that act as a form of food storage, allowing the bulb to stay alive and be dormant if there's a lack of water. Germinate - the process by which seeds begin to grow into plants. Shoot- A shoot refers to the **plant's main stem** or the complex network of various structures like branches, leaves, buds, flowers, and fruits attached to the main stem. Seedling- a **young plant grown from seed**

Grass Seed (dormant)	Wooden spoon Woollen jumper			

Understand that a flame is not **alive** and that a **deciduous** tree is not dead in Winter.
Know that a seed is not dead but dormant.

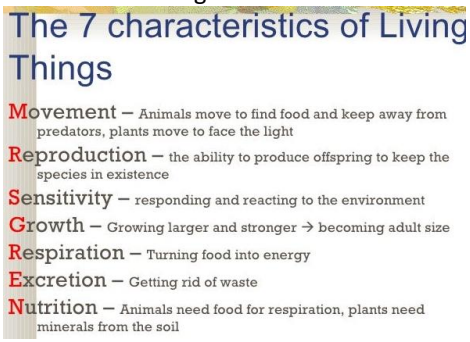
Know that living things **move, grow, consume nutrients and reproduce**

Know that **dead** things use to move, grow, consume nutrients and reproduce but no longer do.

Know that have **never been alive** never did any of the above.

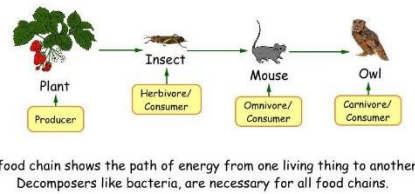
Know **MRS GREN (Move Respire Sensitivity Growth Reproduction Excretion Nutrition)**

Know the meaning of each characteristic



● **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 Know that all creatures need air, food, shelter and water to survive. Know that a fish lives in water, has gills to breathe, eats other water dwelling creatures and plants. Know that a bird uses wings to fly, has lungs to breathe, nests in trees and grassland to escape predators, some birds migrate to warmer places to survive. Know that a badger lives in a set. Know that a fox lives in a set. Know that woodland habitats provide slugs, insects small mammals for food. ● **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.** Know a simple water habitat food chain.  Know a simple woodland food chain	



A food chain shows the path of energy from one living thing to another. Decomposers like bacteria, are necessary for all food chains.

Know that arrows on **food chains** show the direction of **energy.**

Know that **habitats** provide more than one food source.

Know the terminology of **omnivore, carnivore, herbivore** to describe animals in food chains.

● i**dentify and name a variety of plants and animals in their habitats, including microhabitats**

Recognise and name larger habitats - **ocean, tropical rainforest, desert, woodland, tundra and polar ice.**

Know plants and animals in these habitats:

Ocean	Wale Dolphin Shark Parrot Fish Starfish Sea Trout	Kelp Sea Grass Coral
Desert	Camel Tortoise Iguana Eagle Xerus Armadillo Gecko	Cacti Desert Lilly Aloa Vera Acacis Tree

Grassland	Bison Prairie Dog Coyote	Wildflower: Buffalo grass, cacti, sagebrush
Tundra	Arctic hare, arctic fox, musk ox, yak, Antarctic penguin, polar bear, snowy ow	Arctic willow Arctic Poppy Arctic Bearberry
Rainforest	Macaws Toucans Lemurs Jaguars Boa Constrictor Monkeys	Cocoa Tree Rubber Tree
Woodland	Badger Owl Fox Bats	Oak Fern Moses Grass

Know that a microhabitat is a **very small part of a habitat**, such as a clump of grass or a space between rocks.

Know that a **microhabitat** is for extremely small creatures, such as woodlice or a butterfly.

Know the names of specific **invertebrates:**
Bee, centipede, woodlouse, spider, earthworm, earwig, ant, bumblebee.

<u>Vocabulary and Definitions</u>

		Reproduce- to make more, either by having babies or creating copies Alive- All living things can move, using their own energy Dead –no longer able to move or use their own energy. Deciduous - trees that shed their leaves once a year, usually during the season of autumn, when their leaves are mature, or fully grown Microhabitat - a small, localized habitat within a larger ecosystem, Habitat- the place where living things naturally live and grow Ocean - large area of salt water between continents Tropical – warm or hot throughout the year. Rainforest- a tall, dense forest that receives lots of rain every year Tundra- a large, barren region with no trees. Omivore – diet of meat and plants Carnivore-diet of meat. Herbivore- diet of plants	

		Food chain- shows how each living thing gets its food Energy –the ability to do work.	
Year 3	**<u>Autumn 1- Forces and Magnets</u>** **<u>Scientific Discipline: Physics</u>** **<u>Revisit from Year 2</u>** **• Compare how things move on different surfaces.** Know that when an object moves on a surface, the texture of the surface and the object affect how it moves. Know that the texture of a surface may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. Know that the force between two surfaces rubbing together is called friction. Know that a balanced force is when two forces are equal and there is no motion. Know that accelerate means to get faster. Know that decelerate means to slow down. **<u>Knowledge</u>** **• Notice that some forces need contact between two objects, but magnetic forces can act at a distance.** Know that a force is a push or a pull Know that a magnet is a piece of iron or other material which attracts some metals towards it	**<u>Spring 1- Animals Including Humans</u>** **<u>Scientific Discipline: Biology</u>** **<u>Knowledge and Skills</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.** Know that animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Know that food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and **fibre** that are needed by the body to stay healthy. Know a piece of food will often provide a range of **nutrients**. Know that nutrients are substances that help plants and animals to grow. Know and identify the nutrients found in food . Know that to be healthy we need to eat the right types of food to give us the correct amount of these nutrients Know that a diet needs to be balanced. Know that a **vegetarian** diet contains no meat. No that humans are omnivores.	**<u>Summer 1- Plants</u>** **<u>Scientific Discipline: Biology</u>** **<u>Knowledge</u>** • **Identify and describe the functions of different parts of flowering plants: roots; stem/trunk; leaves; and flowers.** Know that many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. Know that the stem or trunk supports the plant so that it stays upright and moves water/nutrients from the roots to other parts of the plant Know the stem holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. Know that the leaves allow plants to make their own food/energy

Know that a magnet attracts magnetic material.

Know that there are also non-contact forces that can act between objects without them touching and that magnetism is an example of a non-contact force.

• Observe how magnets attract or repel each other and attract some materials and not others.

Know that when materials are drawn to magnets this is called attraction.

Know that when materials are not drawn to magnets this is called repulsion.

• Describe magnets as having two poles.

• Predict whether two magnets will attract or repel each other, depending on which poles are facing

Know that the strongest parts of a magnet are the poles.

Know that magnets have two poles – a north pole and a south pole.

Know that if two like poles, e.g. two north poles, are brought together they will push away from each other – repel.

Know that if two unlike poles, e.g. a north and south, are brought together they will pull together – attract.

Know that vitamins and **minerals** are found in different foods:

Know that **vitamins** are known as letters.

Vitamin A	Help fight **disease** Healthy skin and **eyes**	Dairy – milk, cheese Eggs
Vitamin C	Healthy bones, blood **vessel,** muscles	**Citrus** fruits Potatoes Leafy **vegetables.**
Vitamin D	Keep bones, **teeth and muscles healthy.**	Fatty Fish-Salmon, Mackerel, Tuna

Calcium	Helps with **muscle and bone** strength. **Nervous system**.	Nuts, Milk, spinach, broccoli, cheese.
Iron	Healthy blood	Legumes, peanuts, spinach, red meat.

- identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Know what a human skeleton looks like.
Know the bones that support.
Know the bones that help you **move**.
Know bones that protect your **organs**..

Know that some plants produce flowers which enable the plant to reproduce.

Know how to label the above plants parts and their functions in a diagram.

- **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.**

Know that different plants require different conditions for germination and growth

Know that plants are organisms and need certain things to survive:
Water
nutrients from the soil
light
air
room to grow

Know that what plants need vary depending on the plant (e.g. some plants need more sunlight than others)

Know that plants take in carbon dioxide from the air through their leaves

Know that plants produce oxygen, which we need to breathe

	• 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. Know that iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. Know that aluminium, copper,gold and silver are all non-magnetic. **<u>Vocabulary and Definitions</u>** Force-pushes and pulls in a particular direction. magnetic force – a push or pull exerted by a magnet. Names of different types of magnets: bar magnet ring magnet button magnet horseshoe magnet Attract – to pull together. repel- to push away. magnetic material - metal, iron, steel, non-magnetic –aluminium, copper, gold, silver. Poles – the two ends of the magnet are known as the north pole and south pole	<table><tr><td>Support</td><td>Movement</td><td>Protection</td></tr><tr><td>Spine pelvis, tibia fibia</td><td>vertebra patella/knee cap</td><td>skull/cranium rib cage</td></tr></table>Know and locate the bones above. Know animals have muscles that attach to skeletons. Know that muscles help us move. Know the location of **hamstrings abdominals triceps biceps pectorals** Know how muscles and joints help them to move. Know what a hinge joint is (**knuckles/knees/elbows**). Know what a ball and socket joint is (**shoulder/hip/wrist**). Know that when muscles **relax** and **contract** the skeleton moves. Know when a muscle contracts it gets shorter. Know that **tendons** attach muses to bones. Know that muscles can pull but not push. **<u>Vocabulary and Definitions</u>** Nutrition - food and how it works in your body Nutrients- the substances in food that our bodies process to enable it to function. Carbohydrates- the body's major source of energy. The two main types of carbs are: sugars, like the	• **Investigate the way in which water is transported within plants.** Know that the stem of a plant is made up of small tubes called xylem which run from the roots to other parts of the plant, transporting water and nutrients Know that when water evaporates from the leaves, it causes the roots to absorb more water and the process continues Know how to observe and describe how water is transported in a plant (by placing cut, white carnations into coloured water to observe water travelling up the stem to the flower) • **Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal** Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). Know that pollination forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Know the stages of germination, pollination, fertilization, seed dispersal.

		kinds in milk, fruit, table sugar, and candy. starches, found in grains, breads, crackers, and pasta. Sugars- a naturel carbohydrate. Provide immediate energy. Protein- builds, maintains, and replaces the tissues in your body.Found in eggs, nuts, beans, fish, meat, and milk Vitamins- nutrients that humans need in order to grow, reproduce, and be healthy. Only two vitamins are made in the human body. People get most of the vitamins they need from food or vitamin pills. Minerals- compounds that body is needed to be able to grow. Fibre- Dietary fibre is the part of plant food which is not broken down completely by our bodies. Fat- Fats fuel the body and help absorb some vitamins. Skeleton- The collection of bones in an animal's body is called a skeletal system, or skeleton. he hard, stiff bones of the skeleton support the whole body. The skeleton also protects the soft organs inside the body. In addition, the skeleton works with the muscles to allow the body to move. Bones- Humans and many other animals have a skeletal system made up of hard pieces called	Know that once seeds have grown, they need to be dispersed away from the shade and roots of the parent tree so that they can grow into new plants Know that seeds can be dispersed in different ways: • wind (e.g. dandelions) • explosion (some have pods which will burst) • water (light seeds float away; e.g.water lilies) • animals (attached onto or eaten by animals) **Vocabulary and Definitions** leaf - A leaf is a part of a plant. It's attached to a stem or branch and can come in many shapes and sizes. One of their main jobs is to help the plant to collect sunlight Flower- part of a plant that is sometimes called the bloom or the blossom. It plays a big role in the reproductive process - it produces seeds and can vary in appearance and smell. Blossom - he flowering part of a plant or tree that will form the seeds or fruit Petal- a coloured part of a flower Fruit- the part of a flowering plant that contains the seeds

		bones. Bones help to support the body and to protect its organs. Muscles- Muscles make it possible for animals to move. Skull- The skull is a part of the body's skeletal system. The skull is made up of several bones that are joined together like a jigsaw puzzle. Many of the other bones of the body meet at movable joints. The bones of the skull, however, meet at joints that do not move. Rib- a rib is a slender curved bone attached to the spine and forming part of the chest wall. Spine- a vertebrates backbone. Joints - Joints are the places in your body where bones meet. **Spring 2 – Electricity** **Scientific Discipline: Physics** **Identify common appliances that run on electricity** Know that many household devices and appliances run on electricity. Know that some plug in to the mains and others run on batteries. Identify the hazards that might be faced in the home. 1. Overloaded plug extension sockets, 2. Exposed wires,	Berry- small, fleshy fruits that usually have many seeds Root- part of a plant that is usually hidden underground. They hold the plant in the ground and keep it upright. They take water and food from the soil. Seed- the small parts produced by plants from which new plants grow. Photosynthesis- the process in which green plants use sunlight to make their own food Pollen- a fine powdery substance produced by flowering plants, which contains the male sex cell Insect dispersal – the use of insects to carry or spread seeds to other places. Wind dispersal – the use of wind to carry or spread seeds to other places. Germinate - the process by which seeds begin to grow into plants. Pollination - the transfer of pollen from a male part of a plant to a female part of a plant to produce seeds. Fertilisation - the joining of a female and male reproductive parts.

		3. Damaged sockets, 4. Wires left along the carpet for people to trip over, 5. Electrical appliances and wires near water, 6. Placing metal into electrical appliances or open sockets, Have as a revisit for start of lessons from Year 1. **Knowledge** Know that atoms are small particles that makes up everything Know that electricity is the movement of electrons (even smaller particles) from one atom to another Know that electricity is all around us in nature (e.g. lightning storms; electrical eels) • **Recognising some common conductors and insulators of electricity, and associating metals with being good conductors** Know that a conductor is a material which allows electricity to pass through it easily Know that an insulator is a material which does not allow electricity to pass through it easily Know these common conductors of electricity: 1. most metals - copper, iron and steel 2. Water (but only if not pure) Know these common insulators of electricity: 1. Wood 2. Plastic 3. paper 4. rubber Know that humans are conductors of electricity, so we must not touch electrical plugs	Seed formation- the small parts produced by plants from which new plants grow Seed dispersal - the means by which a plant ensures its seeds are spread as far as possible from the parent plant, to give the seeds the best chance of Germination. (wind dispersal, animal dispersal, water dispersal) **Summer 2- Sound** **Scientific Discipline: Physics** **Knowledge** • **Identify how sounds are made, associating some of them with something vibrating.** Know that sound refers to what is created when objects vibrate Know that sound travels through the air as sound waves Know that when sound waves reach our ears, our ear drums vibrate so that we hear the sound

		Know that insulators are used to cover materials that carry electricity (e.g. rubber over an electrical cord) • **Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.** Know that a circuit is a complete path around which electricity can flow Know that a series circuit must contain the following items: -a cell (source of electricity, such as a battery) -wires -an output (bulb or buzzer) Know how to draw and plan a simple series circuit • **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.** Know that all components in a circuit need to be connected in order to work Know how to identify whether an output (lamp, light, buzzer) will light/sound based on whether or not it is part of a complete loop in a circuit Know if the following circuits work or not. 1. A complete circuit without switches. 2. A circuit with wires not connected to the cell on one side. 3. A complete circuit with an open switch. 4. A complete circuit with a closed switch.	Know that sounds are turned into electrical signals which are transferred to the brain Know that sound always needs to travel through some kind of material, such as air, water or metal. Know that sound cannot travel through a vacuum (an area empty of matter). • **Recognise that vibrations from sounds travel through a medium to the ear.** Know that all instruments produce vibrations in different ways (e.g. guitar by plucking strings; percussion instruments by banging; woodwind by blowing) Know that instruments can play different notes, which are a range of particular frequencies, and each note has a different pitch Know that larger instruments tend to make lower and louder notes than smaller ones

		5. A circuit where the wire is not connected to the bulb / buzzer / motor. Know that if a conductor is added to a circuit, it will still work, but if an insulator is added, it will not • **Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.** Know that a series circuit can also contain switches, which open and close a circuit Know how to identify whether an output (lamp, light, buzzer) will light/sound based on whether the switch is opened or closed <u>Vocabulary and Definitions</u> Electricity- a form of energy that can be carried by wires and in used for heating and lighting, and to provide power for devices electrical appliance- a device or machine in your home that you use to do a job such as cleaning or cooking. Appliances are often electrical. Mains - where the supply of water, electricity, or How does a gas enters a building electrical circuit- A complete path that an electric current can flow around. It flows from the battery, through wires and devices before returning to the battery. If the circuit is not complete the electric current cannot flow. complete circuit- is a loop that allows electrical current to flow through wires Component - One part of an electrical circuit.	Know how to listen to and describe different notes made by a range of instruments, commenting on the pitch and volume **Find patterns between the pitch of a sound and features of the object that produced it.** Know that the pitch of a sound refers to how high or low the sound is Know that the pitch is determined by the frequency (the number of times something vibrates a second) – the higher the frequency, the higher the pitch Know how to predict the volume and pitch of a sound based on a sound wave diagram Know how to describe different sounds, attempting to identify them and commenting on the pitch and volume (e.g. a lion's roar, a baby's cry, a flute) Know how to investigate how changing the amount of air and water in bottles changes the pitch

		Cell - A single electrical energy source. Battery - A device consisting of one or more cells Wires - a long thin piece of metal that is used to fasten things or to carry electric current Bulb - the glass part of an electric lamp, which gives out light when electricity passes through it. Switch - An electrical component that can make or break an electrical circuit. Buzzer - An electrical component that creates a buzzing sound. Motor - An electrical component that creates rotary motion. Conductor – materials that let electricity pass through them easily Insulator - materials that do not allow electricity to pass through them N.B. Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6.	Know that when you blow across a bottle, the air inside is vibrating, meaning in bottles with more air, vibrations are slower and the pitch is lower • **Find patterns between the volume of a sound and the strength of the vibrations that produced it.** Know that the loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Know that a sound insulator is a material which blocks sound effectively. Know that volume refers to how loud the sound is and it is measured in decibels • **Recognise that sounds get fainter as the distance from the sound source increases.** <u>Vocabulary and Definitions</u> Sound- created when something vibrates and sends waves of energy (vibration) into our ears. Source- the start of something. Vibrate/vibration- quickly moving back and forth (or up and down) Travel- the activity of going from one place to another place.

<table>
<tr><td></td><td></td><td></td><td>pitch (high, low)- describes a high or low sound

Volume- how loud or quiet the sound is

Faint- quiet sound.
Loud

Insulation -to protect from hot,cold,noise.</td></tr>
<tr><td>Year 4</td><td><u>Autumn 1 Animals Including Humans</u>

<u>Scientific Discipline: Biology</u>

<u>Knowledge</u>
• Describe the simple functions of the basic parts of the digestive system in humans.

Know that digestions if the breaking down of food to obtain energy and nutrients for the body.

Know that digestion in the mouth is mechanical.
Know that digestion in the stomach is chemical.

Name and identify the parts of the digestive system

Know the function of the parts of the digestive system.

<table><tr><td>mouth</td><td>Food enters the digestive system here.
Saliva released in the mouth which helps break down food.</td></tr><tr><td>tongue</td><td>Helps to move food around in the mouth and ensure food is covered with saliva.
Helps you to swallow.</td></tr></table></td><td><u>Spring 1- Rocks</u>
<u>Scientific Discipline: Chemistry</u>

<u>Knowledge</u>
• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.

Know that rock is a naturally occurring material.
Know there are different types of rock .
Identify and name sandstone, limestone, slate and marble.
<u>Know that marble is….</u>
<u>Know that sandstone is….</u>
<u>Know that limestone is…..</u>
<u>Know that slate is…</u>
Know that rocks can be hard or soft.
Know rocks have different sizes of grain or crystal.
Know rocks may absorb water.
Know rocks can be different shapes and sizes (stones, pebbles, boulders).

• Describe in simple terms how fossils are formed when things that have lived are trapped within rock.

Know how a fossil is formed:</td><td><u>Summer 1- Light</u>
<u>Scientific Discipline: Physics</u>

<u>Knowledge</u>
• Recognise that they need light in order to see things, and that dark is the absence of light.

Know that light is a form of energy.

Know that we need light to be able to see.

Know that darkness is the absence of light.

Know that a shadow is as a result of the absence of light.

Know that opaque and translucent objects create shadows when they block light.

Know that in complete darkness you cannot see.

• Notice that light is reflected from surfaces.

Know that surface efficient at reflecting light are smooth and shiny surfaces.

Know that reflection is not a source of light.</td></tr>
</table>

teeth	Cut and grind food small enough to be swallowed.
oesophagus	25cm tube of **muscle**. Connects the **mouth** with the **stomach**. **Relaxes and contracts** – **peristalsis**- to move food to the stomach. Has a one-way **valve** at the bottom to stop food flowing back up.
stomach	A hollow **organ**. **Acid** released to break down food so it can be absorbed. Stomach muscles mix food and acid so broken down into substance called **chyme**. Empties chyme into the **small intestine**s.
Small intestines	Up to 6metres long. Muscular tubes made of three parts. **Nutrients** absorbed here. Moved through **peristalsis**.
Large intestines.	End of the **digestive system**. Muscular tube – 7metres long. Where water is **reabsorbed** into the body so waste becomes more solid. **Faeces** formed and stored in the **rectum**.

Know what happens when **bacteria** affect the digestive system: sickness and diarrhoea.

Know fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.

Know that some rocks contain fossils.

Know that Mary Anning is famous for finding many important fossils
Know that she was born in 1799 in Lyme Regis, Dorset which is near the coast.
Know that 200 million years ago Dorset was beneath the sea. Know that her fossils helped us to understand more about prehistoric animals. Know the term palaeontology means 'a person who studies fossils'

• **Recognise that soils are made from rocks and organic matter**

Know soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter).

Know that reflection is when a light source is bounced back off a surface.

Know that any object that any source or object that emits its own light is a source of light.

Know that the sun, star, fire, lightning, , are all natural sources of light.
Know that lightbulb, torch, lamp, are artificial sources of light.

Know that jellyfish and fireflies are example of bioluminescent.

Know that bioluminescent light is produced by a chemical reaction.

Know that any object that emits off a light of its own is luminous.

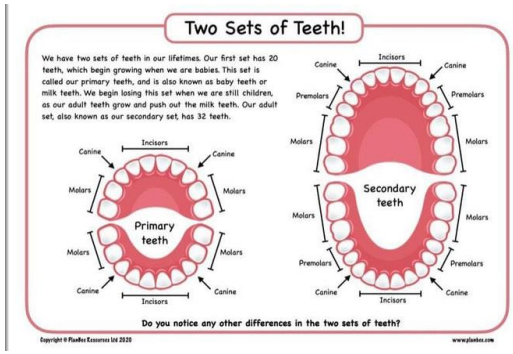
Know a non-luminous object does not emit or reflect light.

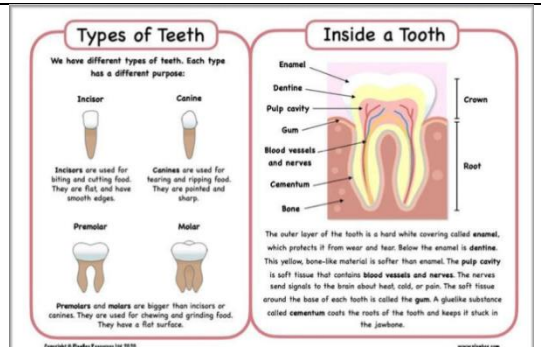
Know that light sources often emit heat as well as light.

- **Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.**

Know that looking directly at the sun is dangerous, as the light is too strong.

Understand that Ultraviolet (UV) light causes blindness or other long term vision problems.

	• **Identify the different types of teeth in humans and their simple functions.** Humans have four types of teeth: **incisors** for **cutting**; **canines** for **tearing**; and molars and premolars for grinding (chewing). Know the location of canines, molars, incisors in the mouth. Know that carnivores have canines. Know that herbivores don't have canines as they grind not tear. Know that herbivores have more molars than a carnivore. Know that children have 20 teeth. Know that adults have 32 teeth.  Know that first teeth are known as both baby teeth and milk teeth but the scientific word is **deciduous teeth**. Know that the baseline of the tooth is the **gum**	Know that the type of rock, size of rock pieces and the amount of organic matter affect the property of the soil. Know that sandy soil is dry and gritty, and does not hold onto water. Know that silty soil is richer in nutrients and smoother to the touch. It has smaller particles (a tiny piece of matter) and it can retain water for longer but will eventually start to lose this. Know that clay soil has the smallest particles and so absorbs more water. It is silky when wet but smooth and solid when dry. It contains the most nutrients as they cannot escape in water **<u>Vocabulary and Definitions</u>** Rock- Rocks are made when mineral grains grow or are fused together. Every rock is made up of one or more minerals. Pebble - a small rock. Grain- small parts of minerals that make up a rock. Crystals- a special kind of solid material where the molecules fit together in a repeating pattern. Texture - how something feels when it is touched. Absorbent - different types of materials which can soak up liquid. An absorbent material has small holes in it. When a liquid comes into contact with	Know that eyes should be protected by covering with either a wide brimmed hat / cap and sunglasses. • **Recognise that shadows are formed when the light from a light source is blocked by an opaque object.** Know and understand that shadows are formed when an opaque object blocks light from passing through. Know that opaque objects block out light. Know that transparent and translucent objects let light through, creating no clear shadows. | Term	Definition	Example of Material | |---|---|---| | Opaque | You cannot see through it | Wood, stone, metal | | Translucent | Some light can pass through it but you cannot see clearly through it | some glass, some plastic, tissue paper | | Transparent | You can see through it clearly | glass, plastic, cling film | **Find patterns in the way that the size of shadows change.** Know that the further away the light source the smaller the shadow as less light



Know that teeth decay is the rotting and disintegration of the tooth.

Know that teeth comprise of a hard outer shell **enamel.**

Know that not brushing your teeth causes tooth **decay**.

Know that a diet high in sugar and acid causes tooth decay.

Know that teeth need to be brushed using flouride.

Know that fluoride protects teeth from tooth decay.

• **Construct and interpret a variety of food chains, identifying producers, predators and prey.**

Know that a food chain shows the flow of energy.

Know that living things can be classified as producers, predators and prey according to their place in the food chain.

an absorbent material, the tiny holes draw in the liquid and it spread through the material.

Permeable- **A material which allows water or liquids to flow through**.

Soil - a mixture of minerals and organic material that covers much of Earth's surface. Minerals are bits of rock, and organic material is the remains of living things that have died. Soil is not as solid as rock. It has many small spaces, called pores, that hold water and air.

Types of soil-sandy/chalk/clay soil

Fossil - Fossils-remains or traces of plants and animals that lived long ago

Natural Rocks-
marble,chalk,granite,sandstone,slate

Manmade Rocks – concrete, mock rocks, bricks.

Spring 2 – Materials – States of Matter
Scientific Discipline: Chemistry

Knowledge

- Compare and group materials together, according to whether they are solids, liquids or gases.

is blocked.

Know that the nearer the light source the larger the shadow as more light is blocked.

Vocabulary and Definitions

Light - Visible light is the portion of radiation on the electromagnetic spectrum that can be seen by the human eye.

Dark- is the absence of light.

light source - If an object produces its own light, it is a light source.

Light sources can be natural or artificial.
Natural light sources come from the environment.
Artificial light is produced by electronics and man-made objects.

Shadow- the absence of light. A shadow is created when an opaque material or object is placed in front of a light source and prevents the light from passing through.

Luminescent- Visible light is the portion of radiation on the electromagnetic spectrum that can be seen by the human eye.

UV - Human beings can see the visible spectrum of light in the world. But many animals - from bees to reindeer, fish and some birds - can see beyond violet: they have ultraviolet vision.

	Know that arrows show the direction of the flow of energy from what is being eaten to the animal doing the eating. Know the names producers, predators and prey within a habitat Know that the sun starts all food chains. Know that a producer is the start of a food chain and is a plant. Know that subsequent animals are consumers. Know that a consumer with no predators is an apex predator. **Vocabulary and Definitions** Digestive system- consists of the parts of the body that work together to turn food and liquids into the building blocks and fuel that the body needs. Digestion- The food that we eat has to be broken down into other substances that our bodies can use, and any waste removed Mouth- the opening to the digestive system Teeth- hard, bony structures that grow from the jawbone. Humans and other animals use their teeth to bite and to chew food.	Know that everything in the universe is made up of matter (anything that takes up space and has mass) Know that particles are tiny bits of matter, which are constantly moving Know that matter can be grouped into three main states: solid, liquid and gas 1. solid: definite shape, mass and volume; particles are packed closely together 2. liquid: definite mass and volume but not shape; particles move around and do not stay in a fixed pattern ,poured and keeps a level, horizontal surface 3. gas: definite mass but no fixed shape or volume; particles move around in a random way and without a container. They will spread out indefinitely Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid.	Shade –partial darkness caused by an opaque object blocking light rays. Opaque - cannot be seen through and does not allow light to pass through it. transparent - light completely passes through it, and you can see clearly through it. translucent letting only some light through so that what can be seen on the other side is not clear reflective - heat, light, or an image that bounces off an object or surface

	Saliva- the clear liquid in your mouth that's made of water and other chemicals. Saliva helps keep the mouth moist and contains an enzyme that starts to break down food even before it hits your stomach Oesophagus- This part of the digestive system is like a stretchy pipe that's about 10 inches (25 centimeters) long. It moves food from the back of your throat to your stomach. Stomach- hollow organ that is a part of the digestive system. Food lands in the stomach after passing down the throat through a tube called the esophagus. The stomach stores food and passes it along in small amounts to the intestines. small intestine- Food enters the small intestine after it leaves the stomach. At this time the food is in the form of a thick liquid. Digestive juices from other organs, including the pancreas and the liver, enter the small intestine. They work with juices from the small intestine to break down the food into simple chemical substances. These substances then pass into the bloodstream through the walls of the small intestine. This process takes three to six hours.	Know how to sort materials into solids, liquids or gases. • Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Know that not all matter is in a fixed state and some materials can change state Know that boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Know that water boils when it is heated to 100oC. Know that melting refers to a substance changing from a solid to a liquid Know that freezing refers to substance turning from a liquid into a solid	

	Nutrients- Nutrients are the substances in food that our bodies process to enable it to function. large intestine- Any food material that cannot be used by the body passes from the small intestine into the large intestine. The large intestine takes water and some minerals from this leftover food material. Tiny living things called bacteria in the large intestine help to turn the food material into feces, or solid waste. The feces are stored in the large intestine until they pass from the body. The work of the large intestine takes between 10 and 20 hours. Rectum- the part of the large intestine just above the anus. Anus- the opening where your bowel movements (also known as poop) come out. Incisor- Incisors are a type of teeth. They help us to cut and chew food. Incisors are the eight large flat teeth with straight edges, that can be found in some mammals, such as humans. They are at the front of the mouth, in between the canine teeth. Canines- Canines are the sharp pointy teeth in mammals' mouths. Canines' functionality is to keep food in place as well as to tear it apart. They assist with speech and keep our	Know that evaporating refers to a liquid changing to a gas Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy. Condensation is the change back from a gas to a liquid caused by cooling. Know that when a substance is heated, it causes the particles to have more energy and move around more quickly and when it is cooled, the particles move more slowly Know how to observe water as a solid, liquid and gas, commenting on the changes to water as it is heated or cooled Know how to predict which materials will change state when heated Know how to observe different substances (e.g. chocolate, butter, cream) being heated, commenting on how they change state	

	lips in the right place. For some species, their role is to intimidate and protect. Most species have four Canines except rodents who have none. Molar - a large, rough-edged tooth found in the back of your mouth used for chewing food. Adults have twelve molars in total, including four wisdom teeth. Molars are the strongest and biggest human teeth. Premolars- he premolar teeth of mammals are the teeth between the canines and the molars. There are at most a total of eight of them. Deciduous teeth – milk teeth. Omivore – diet of meat and plants Carnivore-diet of meat. Herbivore- diet of plants Food chain- shows how each living thing gets its food Energy –the ability to do work. Producer- A producer is the name given to a living thing that produces its own food, rather than consuming another living thing. Producers are typically green plants	Know how to observe and record the temperature at which these changes of state (above) happen • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature • Know that the water cycle is the journey of water through precipitation, evaporation and condensation Know that precipitation refers to any liquid that is produced in the atmosphere and falls down to Earth (e.g. rain, hail, snow) Know that evaporation in the water cycle refers to any water particles which leave the Earth's surface and enter the atmosphere Know that condensation in the water cycle is when water vapour in the air condenses from a gas back into liquid form, and returns to the surface of Earth Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and	

Predator- A predator is wild animal which hunts or preys on other animals for food. They feed on the flesh of animals to survive. Predators are carnivores

Prey- Prey is an animal that is hunted by another for food.

Autumn 2- - Living things and their habitat
Scientific Discipline: Biology

Knowledge and

- **Recognise that living things can be grouped in a variety of ways**.

Know that animals and plants can be put into different groups this is called classification.
Know that animals can be grouped into the following:

- **Warm blooded** v **Cold Blooded**

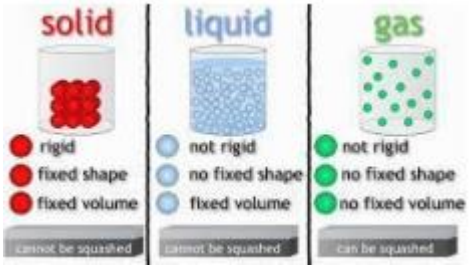
Warm Blooded: Produce their own heat and can live in any temperature.	Cold Blooded: Unable to control its body temperature. Reliant on the temperature of its environment.
Birds and mammals	reptiles, amphibians, insects, arachnids and fish

- **Vertebrates** v **Invertebrates**

Vertebrates: Have an internal back bone surrounded by a bone (vertebrae)	**Invertebrates:** don't have a backbone.

drain back into rivers etc. This is known as precipitation. This is the water cycle.

Vocabulary and Definitions
Solid
Liquid
Gas



state change - Materials can change state when they are heated or cooled.

- A gas condenses into a liquid when it is cooled.
- A liquid freezes into a solid when it is cooled.
- A solid melts into a liquid when it is heated.
- A liquid evaporates into a gas when it is warmed.

Melting- the process of a solid turning into a liquid.

freezing -the process of a liquid turning into a solid.

melting point – the temperature at which a solid turns to liquid for water it is 0 degrees Celsius.

boiling point – the temperature at which a liquid turns to a gas. For water it is 100 degrees Celsius.

evaporation -the process of a liquid turning into a gas.

	Fish Amphibians Reptiles Mammals Birds	Spiders Worms Snails Lobsters Crabs Insects like butterflies	Temperature –measure of how cold it is. water cycle - the cycle of processes by which water circulates between the earth's oceans, atmosphere, and land, involving precipitation as rain and snow, drainage in streams and rivers, and return to the atmosphere by evaporation. Condensation- the process of a gas turning into a liquid.	

Know that an insect has 3 segments: **head, thorax, abdomen.**
Know that insects have an **exoskeleton** (hard outer shell)
Know an **insect** has 6 legs.
Know a spider is an arachnid.
Know **arachnids** have 8 legs, 2 body parts and no **antennae**.

- 5 **Animal Kingdoms**: **mammal, bird, fish, reptile, amphibian.**

Mammal	**Bird**	**Fish**	**Reptile**	**Amphibian**
Fur/Hair Warm blooded Milk Live young Legs	Feathers Wings Beak Eggs Warm blooded	Scales Gills Eggs Cold Blooded Fins	Eggs on land Scales Cold Blooded	Cold blooded Leg eggs in water Young use gills to breathe Live on land

- **Deciduous v Evergreen**

Deciduous Lose leaves in winter. Fresh laves in spring.	**Evergreen** Do not drop their leaves.
Birch Beech Sycamore Oak Willow	Holly Juniper Box (bush)

- **Flowering v Non Flowering**

Flowering Plant Have a flowering head or fruit.	Non-Flowering

- **Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment (Forest school area)**

Mammals: **fox, vole, bat, squirrel, hedgehog, muntjac deer.**
Birds: **robin, blackbird, wren, buzzard, thrush**
Amphibians: **common frog, toad, smooth newt**
Reptiles: **adder, grass snake, smooth snake, slow worm.**
Fish: **stickleback, salmon, trout**
Insects: **ladybird, earwig, shield bug, bee, wasp, ant.**
Arachnids: **Cellar spider, money spider, cucumber green orb spider.**
Molluscs: **snails, slugs**
Worms: **earth worm**

	NB**: A woodlouse is not an insect but a crustacean they have 14 legs.** Deciduous: **Birch Beech Oak Sycamore Willow** Evergreen: **bay tree, box bush, lavender.** Non Flowering: **ferns, grasses, moss** Flowering: **daisy, dandelion, buttercup, daffodil**, • **Recognise that environments can change and that this can sometimes pose danger to living things** Know that naturel disasters can impact a habitat: **wildfires, flood, drought**. Know that humans can impact positively and negatively on environments. Know how humans can impact an **environment** negativly: **deforestation**, urban growth (greenbelt), pacific garbage patch **plastic pollution**. Know how humans can impact an environment positively: **nature reserves**. Know that human actions impact a **habitat** and or food chain. Know how humans can take action to save a **species**. Know how hedgehogs are becoming **endangered** and how to save them. **Vocabulary and Definitions** Environment - refers to the surroundings or conditions that a living organism (people, animals, plants) finds themselves in. Flood- When water overflows onto dry land, a flood takes place.		

	Pollution- when gases, smoke and chemicals are introduced into the environment in large doses that makes it harmful for humans, animals and plants. Deforestation - when humans cut down or burn down large areas of forests to make space for farmland, plantations, or to use the trees as fuel. Mammal - mammal is an animal that breathes air, has a backbone, and grows hair at some point during its life. Amphibian- a cold-blooded vertebrate that spends some time on land but must breed and develop into an adult in water. Reptile- cold-blooded animals that are characterised by their scales and their ability to lay eggs. Bird - Birds lay eggs. Birds have feathers. Their skeletons are strong and light. Many birds can fly, but not all of them can Fish- Fish are cold-blooded; they rely on the environment outside their body to regulate their temperature. Fish live in water, although some can spend big chunks of time outside of the water. In order to live underwater, they have gills, a swim bladder and fins to help them move around easily. Most fish lay eggs.		

	Insect- creatures that have bodies with three segments that are protected by a hard shell. They have three pairs of legs and a pair of antennae. Exoskeleton- An exoskeleton is a hard covering that supports and protects the bodies of some types of animals. Warm blooded- having a body temperature that remains steady and warm, no matter what the outside temperature is. Cold blooded- having blood whose temperature changes with the temperature of the air or water. Endangered -any type of plant or animal that is in danger of disappearing forever		
Year 5	**Autumn 1- Properties of Everyday Materials – Reversible/Irreversible Changes** **Scientific Discipline: Chemistry** Knowledge • **Comparing and grouping together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets** Know that a thermal conductor allows heat to move through it easily (e.g. a saucepan)	**Spring 1- Animals including humans** **Scientific Discipline: Biology** Knowledge • **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.** Know that as part of their life cycle, plants and animals reproduce. Know that most animals reproduce sexually.	**Summer 1- Earth and Space** **Scientific Discipline: Physics** Knowledge • **Describing the movement of the Earth, and other planets, relative to the Sun in the solar system** Know that a planet is a large astronomical object that orbits a star Know that an orbit refers to a curved path that an astronomical object or spacecraft makes around a star, planet or moon

	Know that a thermal insulator does not let heat travel through it easily (e.g. woollen clothes and flasks for hot drinks) Know how to compare and group a range of materials (including objects with metal, plastic, wood, glass and fibre) based on their properties, including: hardness transparency magnetism absorbency conductivity Reflectiveness Know how to explain why different materials are used for different objects (e.g. glass for windows, cotton for towels) • Knowing that some materials will dissolve in liquid to form a solution, and describing how to recover a substance from a solution Know that a solution is a mixture where a substance has been dissolved into another Know that a solute is the substance being dissolved Know that the solvent is the substance that dissolves another Know how to identify the solute and solvent in a solution, e.g. salt dissolving in water	Know that sexual reproduction involves two parents where the sperm from the male fertilises the female egg. Know that gestation refers to the process/period of developing inside the womb Know that gestation periods vary depending on the mammal Know that animals, including humans, have offspring which grow into adults. Know that in humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. Know that in other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Know some young undergo a further change before becoming adults e.g. caterpillars to butterflies. Know that a complete change is called a metamorphosis. Know that plants reproduce both sexually and asexually. Know that bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent.	Know that a star is a large astronomical object that produces its own light (including the Sun) Know that our solar system refers to the Sun at its centre and everything bound to it by gravity, including the eight planets Know that there are other planetary systems (orbiting other stars) like ours Know what the eight planets in our solar system are: Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune Know how to identify the eight planets and their order from the Sun Know that Pluto used to be classified as a planet, but because of its size, it is now classified as a dwarf planet Know that some of the planets are smaller, rocky planets with solid ground: Mercury Venus Earth Mars Know that some planets are larger gas giants: Jupiter Saturn

	Know that substances which dissolve into water are called soluble and those which do not are insoluble Know that dissolving a soluble substance is a reversible change as it will resettle after time • **Using knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating** Know that mixtures are when two or more substances are mixed together, but this is reversible as they can be separated Know that mixtures can be reversed in a variety of ways, including: evaporation, magnetism, filtering, sieving, decanting Know how to observe the separation of a variety of different mixtures, commenting on how they go back to the original state (e.g. mixing oil and water, using a sieve to separate raisins and flour, etc.) • Explaining 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 Know that chemical changes are irreversible, meaning that new materials	Know that gardeners may force plants to reproduce asexually by taking cuttings. Know that sexual reproduction occurs through pollination, usually involving wind or insects. **<u>Vocabulary and Definitions</u>** anther the part of a stamen that produces and releases the pollen bulb a root shaped like an onion that grows into a flower or plant cell the smallest part of an animal or plant that is able to function independently dispersed scattered, separated, or spread through a large area dissect to carefully cut something up in order to examine it scientifically embryo an unborn animal or human being in the very early stages of development fertilisation male and female gametes meet to form an embryo or seed flower the part of a plant which is often brightly coloured and grows at the end of a stem flowering trees or plants which produce flowers function a useful thing that something does gamete the name for the two types of male and female cell that join together to make a new creature germination if a seed germinates or if it is germinated, it starts to grow life cycle the series of changes that an animal or plant passes through from the beginning of its life until its death mature When something matures, it is fully developed metamorphosis a person or thing develops and changes into something completely different ovary a female organ which produces eggs	Uranus Neptune • **Describing the Sun, Earth and Moon as approximately spherical bodies** Know that people used to think that the Earth was flat (and some people still do, but they are wrong) Know that the planets, Sun and moon are approximately spherical Know that a satellite refers to a planet, moon or machine which orbits a planet or moon Know that we know the shape through various sources, including space exploration and photographs from satellites Understanding how scientists know about the solar system and how our understanding has changed over time. Know that Claudius Ptolemy was born in Egypt during the Roman Empire and was influenced by Ancient Greek astronomers Know that Ptolemy believed that the Earth was at the centre of the universe Know that in the 1500s an astronomer called Copernicus believed that the Sun was at the centre of the universe and everything revolved around it (heliocentric model)

	have been formed and they cannot be changed back Know that some examples of irreversible changes to materials include: burning and acid with bicarbonate soda, whipping an egg, melting chocolate, popcorn, heating bread, melting ice. Know the products of some irreversible products are useful: Milk and vinegar make plastic Carbon dioxide produced through and irreversible change. **Vocabulary and Definitions** Magnetic - a rock or a piece of metal that can pull certain types of metal toward itself. Reflective - capable of reflecting light, images, or sound waves Conductor – materials that let electricity pass through them easily Sieve- a device with meshes or holes to separate finer particles from coarser ones or solids from liquids Filtering- Removing small particles of Insoluble or undissolved material from a liquid, usually by using a barrier with very small holes such as filter paper.	ovule a small egg petal thin coloured or white parts which form part of the flower plant a living thing that grows in the earth and has a stem, leaves, and roots pollen a fine powder produced by flowers. It fertilises other flowers of the same species so that they produce seeds pollination To pollinate a plant or tree means to fertilise it with pollen. This is often done by insects reproduction when an animal or plant produces one or more individuals similar to itself seed the small, hard part from which a new plant grows stigma the top of the centre part of a flower which takes in pollen structure the way in which something is built or made **Spring 2 – Animals including Humans** **Scientific Discipline: Biology** **Knowledge** • **Describe the changes as humans develop to old age.** Know that there are different stages of a human's life: 1. foetus: unborn offspring of a mammal; grows inside a female's womb 2. baby: needs to be fed and looked after 3. toddler: beginning to walk/talk 4. child: ages 3-18 5. adult:18 onwards; finished growing; usually lives independently 6. elderly/old age: many may retire; not as strong or fast as when they were younger	Know that Galileo Galilei agreed with the heliocentric model and improved the telescope to view the Sun and planets in space, leading to his discovery of Jupiter's moons Know that Katherine Johnson was an American mathematician whose calculations helped NASA put an astronaut into orbit around Earth **Describing the movement of the Moon relative to the Earth** Know that the moon is the largest object that orbits the Earth Know that it takes just over 27 days for the moon to orbit the Earth Know that the moon looks different at different times in a month because as it rotates around the Earth, the Sun lights up different parts of it Know how to explain how the phases of the moon change, beginning with a new moon. **Using the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky** Know that the Earth rotates on an axis, an imaginary straight line which an object spins, and

	Solution- Solutions are the result of a solute being dissolved by a solvent. A mixture of two or more substances that stays evenly mixed. Substances that are combined to form a solution do not change into new substances. Some examples of solutions include seawater, gasoline, glass, steel, and air. Mixture- a substance in which two or more substances are mixed but not chemically joined together, meaning that a chemical reaction has not taken place. Mixtures can be easily separated and the substances in the mixture keep their original properties. Irreversible change - An irreversible change is a scientific definition of a change where something cannot go back to what it was before. Usually, new materials are formed during an irreversible change. Some examples of irreversible changes are cooking, burning, rusting and sometimes mixing Reversible- a change that occurs that can be changed back again. No new materials are created in a reversible change and we can get the original materials back again. Some examples of reversible changes are melting chocolate (this can be solidified again) and freezing water (ice can melt again). Dissolving is when a solute (soluble substance) is added to a solvent (liquid that does the dissolving) to form a solution. The	Know that puberty is when a person's body begins to develop and change as they move towards becoming an adult Know that adolescence refers the phase between childhood and adulthood, from the onset of puberty Know that puberty happens at different times for different people and involves physical and emotional changes 1. voice getting deeper 2. growing more hair 3. starting menstrual cycle 4. accelerated growth Know how to construct a timeline indicating stages in growth and development of humans Know that when babies are young, they grow rapidly. Know that when babies are young they are very dependent on their parents. Know that as babies develop, they learn many skills. Know that at puberty, a child's body changes and develops primary and secondary sexual characteristics. Know that puberty enables the adult to reproduce. This needs to be taught alongside PSHE. The new statutory requirements for relationships and health education can be found below. <u>Vocabulary and Definitions</u>	the Earth's axis goes through the North and South Poles Know that when the side of the Earth facing the Sun is experiencing daytime, the side of the Earth facing away from the Sun is experiencing night-time Know that it is the Earth's rotation which makes the Sun appear to move across the sky <u>Vocabulary and Definitions</u> **New**: We cannot see the Moon when it is a new moon. **Waxing Crescent**: In the Northern Hemisphere, we see the waxing crescent phase as a thin crescent of light on the right. **First Quarter**: We see the first quarter phase as a half moon. **Waxing Gibbous**: The waxing gibbous phase is between a half moon and full moon. Waxing means it is getting bigger. **Full**: We can see the Moon completely illuminated during full moons. **Waning Gibbous**: The waning gibbous phase is between a full moon and a half moon. Waning means it is getting smaller. **Third Quarter**: We see the third quarter moon as a half moon, too. It is the opposite half as illuminated in the first quarter moon. **Waning Crescent**: In the Northern Hemisphere, we see the waning crescent phase as a thin crescent of light on the left.

	solute seems like it disappears when in fact it is being broken down into pieces so small that we cannot see them anymore. Dissolving is a reversible change; the original substances can be recovered by causing the liquid to evaporate, separating it from the solute. Evaporation- is a change of state, for example where a liquid turns to a gas like water to water vapour. It's part of the water cycle and a process that your child will learn about in science lessons. Condensation - is when something changes from gas to liquid. Water vapour (gas) particles lose energy, cool and change to a liquid. This process is part of the water cycle and is a change of state. Gas – a state of matter • A gas is a substance made up of high energy particles that are constantly moving rapidly. • The particles are not in a fixed structure and are not close together either - they are spaced out and always moving. • Gases have no fixed shape. They can flow, take the shape of a container and even be squashed too. Solid- a state of matter. • A solid is a substance that holds its shape because it is made up of	Puberty – the vocabulary to describe sexual characteristics	Solar system- consists of the Sun and everything that orbits, or travels around, the Sun. Planets- A planet must do three things: it must orbit a star, it must be big enough to have enough gravity to force a spherical shape, and it must be big enough that its gravity cleared away any objects of a similar size near its orbit Satellite- a small object that orbits, or revolves around, a larger object in space. Satellites can be natural or artificial Day - the time of light between one night and the next Night- **the hours of darkness between sunset and dawn** Orbit- the path of an object around a particular point in space, Rotate- to turn an object around a centre point Axis- An axis is an imaginary line an object turns around. This imaginary line runs directly through the object's centre, from the north to the south poles. Although we can't feel the Earth spinning, it makes one complete turn, each day, around its own axis. Spherical – close in appearance to a sphere. **Summer 2- Forces**

	particles that are packed closely together in a fixed structure. • The particles that make up a solid are low energy, so they barely move from their position. • Some solids can sometimes be changed by squeezing, stretching, squashing, twisting or bending. Liquid – a state of matter • A liquid is a substance where the particles are still close together, but not as tightly bonded or in a fixed structure like a solid. This freedom means they can slide past each other. • The particles that make up a liquid have a bit more energy than those in a solid, meaning they move around more. • Liquids can be poured and take the shape of the container they are poured into - they change shape. When liquids change shape, they still take up the same amount of space overall.		**<u>Scientific Discipline: Physics</u>** **<u>Knowledge</u>** **Explaining that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object** Know that everything on Earth is powered by forces Know that Isaac Newton discovered the law of gravity and therefore force is measured in Newtons (N) Know that objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Know that the mass of an object is measured in grams, kg, etc., whereas the weight of an object changes depending on gravity **Identifying the effects of air resistance, water resistance and friction, that act between moving surfaces** Know that friction always works in the opposite direction in which the object is trying to move Know that the rougher the surface, the more friction is produced Know that friction produces heat

			Know how to identify some ways in which friction is a useful force in our lives (e.g. prevents our shoes from sliding or tyres from skidding) Know that water resistance is a type of force that uses friction to slow things down that are moving through water (or any other fluid) Know that air resistance refers to the friction between air and another material, slowing the object down Know how to identify different examples of air and water resistance (e.g. aeroplane, parachute, swimming) Know that in general, the larger the object, the slower it will fall as there is greater air resistance, slowing it down Know that the same applies to water resistance: the greater surface area of the object, the more water resistance it encounters **Recognising that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect** Know that a lever is a simple machine consisting of a beam or rod pivoted on a fixed hinge, making objects easier to lift

			Know that a pulley is a simple machine consisting of a wheel over which a rope/chain is pulled in order to move heavy objects Know that a gear is a rotating part in a machine with teeth cut around its circumference Know how to sort mechanisms into levers, pulleys and gears **<u>Vocabulary and Definitions</u>** Force- an action that changes or maintains the motion of a body or object Friction - a force between two surfaces that are sliding, or trying to slide, across each other Water resistance- friction between your skin and the water particles. The water slows down an object that is moving through it. Water resistance is a type of friction just like air resistance. Air resistance- a kind of friction that occurs between air and another object. It is the opposing force that the object experiences as it passes through the air. Air resistance and gravity are the two fixed forces of nature which move on any object lifted from the earth and moved through the air. Newtons- s the amount of force required to make a mass of 1kg accelerate (move) at a rate of 1 metre per second squared.

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<td>Gravity- a pulling force that works across space.
Gears- wheels with teeth that slot together. When one gear is turned the other one turns as well. If the gears are of different sizes, they can be used to increase the power of a turning force. The smaller wheel turns more quickly but with less force, while the bigger one turns more slowly with more force.

Levers- machines used to increase force. We call them "simple machines" because they have only two parts — the handle and the fulcrum.

Pulleys- a simple machine that makes lifting something easier. A pulley has a wheel or set of wheels with grooves that a rope or chain can be pulled over</td>
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<td>Year 6</td>
<td><u>Autumn 1- Light</u>

<u>Scientific Discipline: Physics</u>

• Recognise that light appears to travel in straight lines.

Know that light is a form of energy which travels in straight lines and it does not need a medium to travel through

Know that a primary light source is one that creates the light it omits

Know that reflection refers to when light bounces off of a surface and changes direction</td>
<td><u>Spring 1- Evolution and Inheritance and Classification</u>
<u>Scientific Discipline: Biology</u>

<u>Knowledge</u>

• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

. Know that fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution.

Know how a fossil is formed:</td>
<td><u>Summer 1- All Living Things - Circulation</u>
<u>Scientific Discipine: Biology</u>

<u>Knowledge</u>
• Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.

Know the circulatory system is the system that circulates blood through the body.

Know that this consists of the heart, blood vessels, blood, veins, arteries, capillaries, oxygen, lungs and ribcage.

<table>
<tr><td>heart</td><td>the organ in your chest that pumps the blood around your body.</td></tr>
<tr><td>Blood vessels</td><td>the general name for the narrow tubes through which your blood flows</td></tr>
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Know that a secondary light source receives light from another source and reflects it

Know how to draw a diagram showing how light travels and reflects off an object

Know that refraction refers to when light travels through transparent materials (such as water or glass) causing light to bend and create illusions

Know how to observe refraction, commenting on how it becomes distorted (e.g. putting an arrow behind a glass of water to observe how the arrow appears to point in the opposite direction)

Know how to comment on what happens when a range of light sources reflect and refract off of different objects (e.g. water, glass, mirrors, etc.)

• 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.

Know how to research how the eyes and brain work to process information and allow us to see

Know that our eyes are in constant motion

Know examples of fossil evidence that can be used to support the theory of evolution

- Human skull
- Horses

• Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.

Know that all living things have offspring of the same kind, as features in the offspring are inherited from the parents.

Know that due to sexual reproduction, the offspring are not identical to their parents and vary from each other.

• Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

	includes the arteries, veins and capillaries
blood	a red fluid that is pumped by the heart through the arteries and veins, supplies tissues with nutrients and oxygen.
veins	blood vessels that carry blood to the heart.
arteries	blood vessels that carry blood away from the heart.
capillaries	microscopic blood vessels found in the muscles and lungs
oxygen	a colourless gas that exists in large quantities in the air. All animals need oxygen in order to live.
lungs	the two spongy organs inside your chest which fill with air when you breathe in. They remove carbon dioxide from blood and add oxygen.
Ribcage	the bony structure consisting of the ribs and their connective tissue that encloses and protects the lungs, heart
Carbon dioxide	a gas produced by animals and people breathing out

Know the location of the lungs and heart

Know that the heart is a hollow muscular organ that pumps the blood through the circulatory system by regular contractions.

Know there are four chambers with two atria and two ventricles.

Know the following sequence that explains the function of the heart –

1. Deoxygenated blood flows into the heart from the body through the veins

	Know that our visual attention only processes a small amount of the information around us Know that light passes through the cornea of the eye and moves to the retina Know that visual information is sent to the brain, which then process the information and allows us to see • **Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them** Know that a shadow is a dark area, formed when light rays are blocked by an opaque object Know that the shadows formed from translucent objects are not as dark, because they let some light rays through Know that transparent objects do not create shadows because they let all light rays through Know that because light cannot bend around an opaque object, the shadow will be in the same shape as the object Know that a shadow can change size depending on the distance from the object **<u>Vocabulary and Definitions</u>**	Know that plants and animals have characteristics that make them suited (adapted) to their environment. Know that if the environment changes rapidly, some variations of a species may not suit the new environment and will die. Know that if the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. Know that over time, these inherited characteristics become more dominant within the population. Know that over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. Know that the above is evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics. Can explain the process of evolution from Charles Darwin. Know that Charles Darwin used finches to prove evolution. Know that finches beaks adapted to different food sources. Know examples of how plants and animals are suited to an environment.	2. This blood is pumped out to the lungs through the pulmonary artery 3. Blood is then oxygenated in the lungs 4. Blood returns to the heart through the pulmonary vein 5. The oxygenated blood is then pumped out of the heart through the aorta 6. The blood travels around the body delivering oxygen and nutrients to the organs. Know that oxygenated means 'to be enriched with oxygen' Know that deoxygenated means 'to be depleted of oxygen' Know that blood is red when oxygenated and deep purple or blue looking through skin when not. • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Know that diet, exercise, drugs and lifestyle have an impact on the way our bodies function. Know that the above can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. Know that fatty rich foods can clog arteries and veins, preventing blood from delivering what is needed. Know that exercise can improve the health of a person by removing fatty deposits from the body. Know that some conditions are caused by deficiencies in our diet e.g. lack of vitamins.

Refraction - When light travels from air into water, it slows down, causing it to change direction slightly.

straight lines - Light appears to travel in straight lines, travelling from light sources until it hits the surface of an object.

mirror- is an opaque object that reflects almost all of the light that hits it.

Light - Visible light is the portion of radiation on the electromagnetic spectrum that can be seen by the human eye.

Dark- is the absence of light.

light source - If an object produces its own light, it is a light source.

Light sources can be natural or artificial.
Natural light sources come from the environment.
Artificial light is produced by electronics and man-made objects.

Shadow- the absence of light. A shadow is created when an <u>opaque</u> material or object is placed in front of a light source and prevents the light from passing through.

Luminescent- Visible light is the portion of radiation on the electromagnetic spectrum that can be seen by the human eye.

Animal	Plant
<u>Penguin</u> • white belly to camouflage from predators swimming under it. • Huddle to keep warm and protect chicks from predators. • Many layers of feathers trapped air and keep them warm. • Secrete oil from glands in skin to keep the feathers waterproof. • Circulatory system can be adjusted to reserve or release heat to enable them to regulate their temperature – too cold, blood passes closer to organs. • Flap flippers when too hot and lay flippers close to their body when too cold. • Thick layer of blubber insulates them. • Flippers instead of wings to help them swim. • Torpedo shaped body more streamline. • Supraorbital gland in their body enables	<u>Cactus</u> • Leaves, called spines, smaller surfaces area, reducing water loss during transpiration. • Needles protect against consumers. • Stem of the cactus is swollen with many cells that can store water. • Stem is green and so carries out photosynthesis. • Shallow root system to absorb as much water as possible even during light rain showers. • Covered in a thick waxy cuticle to conserve water

• Describe the ways in which nutrients and water are transported within animals, including humans.

<u>Vocabulary and Definitions</u>

Heart - the organ, or body part, that pumps blood through the body

Pulse/rate - Your heart rate, also called your pulse, is the number of times your heart beats every minute.

pump - piece of equipment that is used to cause liquid, air, or gas to move from one place to another

blood - Blood is needed to keep us alive. It brings oxygen and nutrients to all the parts of the body so they can keep working.

blood vessels- a system of tubes that carry the blood throughout the body.
transported

lungs - Lungs are bag like organs, or body parts, used for breathing. They are part of the body's respiratory system. All animals that have a backbone and breathe air have lungs.

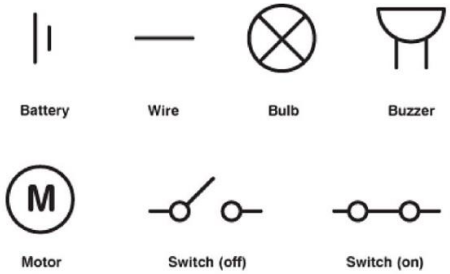
Oxygen- the most common chemical element found on or in Earth. It is one of the main elements that make up air, and it is necessary for the survival of all plants and animals.

carbon dioxide - Carbon dioxide is a chemical compound that is usually in the form of a gas

nutrients- vitamins, minerals, carbohydrates, protein and fat.

	UV - Human beings can see the visible spectrum of light in the world. But many animals - from bees to reindeer, fish and some birds - can see beyond violet: they have ultraviolet vision. light form of energy which our sense of sight can detect. Shade –partial darkness caused by an opaque object blocking light rays. Opaque - cannot be seen through and does not allow light to pass through it. transparent - light completely passes through it, and you can see clearly through it. translucent letting only some light through so that what can be seen on the other side is not clear reflective - heat, light, or an image that bounces off an object or surface **<u>Autumn 2- Electricity</u>** **<u>Scientific Discipline: Physics</u>** **<u>Knowledge</u>** ***Check the following before continuing:*** *Know that electricity can flow through the components in a complete electrical circuit.*	them to drink salt water. • Thick bones, make them heavier and able to dive deeper. <u>Camel</u> • Can go a week or more without drinking water. • Can last several months without food. • Wide feet to spread pressure and enable them to walk on sand. • Long eyelashes and long slits for nostrils which they can close to protect from blowing sand. • Extremely long large intestines to ensure absorb every last drop of water. • Humps made from fat which can store 3 times amount of water than normal fat. When on long journeys, this fat is broken down and water and energy released. • Can drink a significant amount of water in short amount of time. • Spit cud to discourage attack from predators.		Water - liquid that descends from the clouds as rain, forms streams, lakes, and seas, and is a major part of all living material Muscles- Skeletal muscle controls movement, posture (position of the body), and balance. circulatory system - the body system that moves blood round the body. Diet - the food and drink that a person, animal, or group usually takes. Exercise - Exercise is a way of keeping the body healthy through being active Drugs - A drug is a substance that changes the way a person's body works. lifestyle - the way we live

	Know that a circuit always needs a power source, such as a battery, with wires connected to both the positive (+) and negative (-) ends. *Know that a battery is made from a collection of cells connected together.* *Know that a circuit can also contain other electrical components, such as **bulbs, buzzers** or **motors**, which allow electricity to pass through.* *Know that electricity will only travel around a **circuit** that is complete. That means it has no gaps.* • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Know that the more volts there are in a circuit, the more power there is travelling through it. Understand that the higher the volts, the brighter a lamp and the louder a buzzer. Know that adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. • 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.	Know examples of how an animal or plant has evolved over time. Know the case study of the peppered moth. 1. Light-coloured moths were common 2. During the Industrial Revolution (1760 – 1840) coal burning covered the moth's habitats in black soot 3. This gave the dark coloured moths a greater chance of survival because they had better camouflage than the light moths 4. Many light-coloured moths died as they were easily spotted by their prey 5. Dark coloured moths became more common 6. As pollution has reduced over time the light-coloured moths have now become more common again **<u>Vocabulary and Definitions</u>** Offspring - the child or young of a particular human, animal, or plant sexual reproduction - Most animals use sexual reproduction to have babies. This means that two sex cells, one from a male and one from a female, join together to create a baby. Characteristics - typical or special quality of a person, group, thing Suited Adapted -the natural process by which an animal or plant becomes fitted to its surroundings, or environment, Environment - the things and conditions that are all around	

	Know that using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. You can use a switch in a circuit to create a gap in a circuit. This can be used to switch it on and off. Know that when a switch is open (off), there is a gap in the circuit. Know that when a switch is closed (on), it makes the circuit complete. • Use recognised symbols when representing a simple circuit in a diagram. Know that when drawing circuit diagrams, rather than drawing detailed components, we use simple symbols to represent the different components. Know which symbols to use when drawing a circuit  	Inherited - When living things reproduce they pass on characteristics to their offspring. Species - A group of living things with very similar characteristics. Fossils-remains or traces of plants and animals that lived long ago Evolution - the theory that all the kinds of living things that exist today developed from earlier types. The differences between them resulted from changes that happened over many years. **Spring 2 – All Living things and Habitat (Classification)** **Scientific Discipine: Biology** **Knowledge** • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. Know that a species is a class of plants or animals whose members have the same main characteristics and are able to breed with each other Know that there are millions of species of living things on our planet. Know that it would be difficult to describe and name each one individually. Know that while species can be very different from each other, many of them have similar features that allow us to put them into groups.	

	 **Vocabulary and Definitions** Circuit- a complete route which an electric current can flow around. complete circuit - a closed loop or path around which an electrical current can flow. cell - a cell is a single unit that produces chemical energy which is converted into electrical power. component -The parts of an electrical circuit. battery - A device that contains one or more cells and produces chemical energy which is converted into electrical power. It has a positive and a negative terminal. Bulb - a bulb is a glass container that converts electricity into light; Buzzer - A device that makes a low, continuous humming sound when an electrical current is passed through it. Motor - A machine that is powered by electricity and supplies power to a device with moving parts.	Know that grouping things helps scientists identify gaps in their research and they get an idea of what to investigate next. Know that, in 1735 (in the eighteenth century), Carl Linnaeus started the modern system of organising species of organisms into certain groups and giving them scientific names. Know that each species is given a name using Latin words, so that the same name can be used all over the world. Know that the scientific name for modern human beings is 'homo sapiens'. Know that homo means 'man' and sapiens means 'wise'. Know initial three classification groups: animals, plants, microorganism. Know that animals are split into vertebrates and invertebrates. Know that invertebrates have no backbone. Know that vertebrates have a backbone. Know that plants can be classified into two groups - flowering and non-flowering. Know that non-flowering plants can be divided into two groups - (revisit knowledge from year 5 - reproduce with spores and those that use seeds to reproduce). • Give reasons for classifying plants and animals based on specific characteristics Know the key features of the 5 animal kingdoms.	

	Switch - an electrical component that can be open or closed to interrupt or allow the flow of electricity through a circuit. current - the flow of electricity through a wire or circuit	Know the following plants by their appearance **Flowering Plant:** Daisy, Dandelion, Daffodil, Tulips, Bluebell **Non Flowering:** Fern, Moss Revise parts of a plant: petals, leaves, roots, stem, sepal, anthers, filament, bulb, ovules. Know that a microorganism is a microscopic organism, especially a bacterium, virus, or fungus. Know that microorganisms can be helpful and harmful. Know how yeast is used in the food industry. Know the Alexander Flemming discovered penicillin to fight infections. Know what is needed to encourage microorganism growth and link this to Mrs Gren (Year 2) Know that mushrooms and fungi are not plants - they belong to a separate classification of living things called fungi. **<u>Vocabulary and Definitions</u>** Vertebrates - animals that have a spine Fish - Fish are vertebrates (vertebrates have backbones) that live in water. They breathe using special organs called gills Amphibians - any organism that is able to live both on land and in water	

		Reptiles - any of a group of cold-blooded air-breathing vertebrates that usually lay eggs and have skin covered with scales or bony plate Birds - are warm-blooded vertebrates (vertebrates have backbones) and are the only animals with feathers. Mammals - an animal that breathes air, has a backbone, and grows hair at some point during its life. In addition, all female mammals have glands that can produce milk Invertebrates – an invertebrate is an animal without a backbone insects - organism with three pairs of legs and three body regions: head, thorax, and abdomen. Spider - are eight-legged creatures known for making silk webs to catch insects. Snails - invertebrates, which means they do not have a backbone. These animals move around on a single muscly “foot” and carry their home (shell) on their backs. Worms - soft, long-bodied invertebrates, or animals without a backbone. flowering – any plant that produces a flower. non-flowering - producing no flowers especially : having no flowering stage in the life cycle microorganism - living things that are too small to be seen with the naked eye. They are normally viewed using a microscope. Bacteria, viruses, and some molds are examples of microorganisms.	