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Science

YR	Autumn	
	Materials	**Vocabulary:** float, sink, bottom, top, surface, melt, hot, cold, frozen, warm, slippy, change, push, pull, soft, hard, hot, cold
	Required prior knowledge Children should know: • Objects are made from different things • Children will use words such as hard and soft to describe some materials • Objects do different things when placed in water • Some objects are cold and some are hot and things may change	End point • Children to sort materials into groups and explain how they have been sorted • Children can talk about why chocolate/ice changes and predict what might happen next and explain why. • Talk about why some materials are better to use for a purpose than others. • Understand why some things float and some things sink and make predictions • Children are able to use new vocabulary taught in their answers
	Seasons (linked to geography)	**Vocabulary:** soil, seed, water, leaves, roots, underground, worm, bristles
	Required prior knowledge Children should know: • The weather changes during the year Knowledge of days/weeks/months	End point • Name the four seasons • To play and explore outside in all seasons and in different weather (reflection takes place throughout the year) • To observe living things throughout the year

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<table>
<tr><th colspan="2">Spring</th></tr>
<tr><td>Space (linked with geography)</td><td>Vocabulary:
Sun, Moon, Mercury, Venus, Earth, Mars, Jupiter, Uranus, Neptune, Pluto, space, astronaut, rocket, attract, push</td></tr>
<tr><td><u>Required prior knowledge</u>
Children should know:
There is a sun and moon
Objects are made of different materials and they behave differently
Light changes during the day and night and that it goes dark at night</td><td><u>End point</u>
Children are able to name some planets and say where we live
Begin to understand gravity and space travel
Children are able to talk about pushes and pulls
Explore different materials using a magnet and notice which objects/materials they attract
Children are aware that objects can block out light and it creates a shadow</td></tr>
<tr><th colspan="2">Summer</th></tr>
<tr><td>Animals including humans</td><td>Vocabulary:
egg, hatch, grow, chrysalis, change, feathers, beak, tadpole, frogspawn, froglet, lifecycle</td></tr>
<tr><td><u>Required prior knowledge</u>
Children should know:
Things grow and change</td><td><u>End point</u>
1.Learn about senses (sight and touch)
2. Learn about sense (hearing and sight)
3. Explore the senses of smell and touch.
4. Learn about your sense of taste
5. Learn about your body parts e.g. My _____ help me to _____
6. Discover how our bodies change
7. Learn the lifecycle of a butterfly and notice the changes
8. Learn the lifecycle of a tadpole and notice the changes</td></tr>
</table>

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		• 9. Learn the lifecycle of a bird and notice the changes • 10.Learn about living and non-living things.

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Y1	Autumn	
	Animals including Humans	**Vocab:** energy, growth, habitat, fish, amphibian, reptile, bird, mammal, offspring, carnivore, herbivore, omnivore, vertebrate, organ. Sense/senses: **sight, hearing, touch, taste, smell** Skeleton, head, neck, ear, mouth, shoulder, hand, fingers, leg, foot, thumb, eye, nose, knee, toes, teeth, elbow.
	<u>Required prior knowledge</u> Children should know: • Pupils understand that animals, including humans, grow and change throughout their lives. • Pupils name and locate different parts of their bodies, including the sense organs. • Pupils can name and compare two different animals. • Pupils talk about the life cycle of a frog, and explain how it changes over time.	<u>End point</u> • A variety of common animals include (examples may vary): fish (tuna, eel, shark), reptiles: (snake, tortoise, alligator), amphibians: (frog, newt, salamander), birds: (penguin, chicken, robin), mammals (human, cow, mouse). • Carnivores eat only meat, herbivores eat only plants and omnivores eat both meat and plants. • Animals have different structures: *Mammals breathe air, grow hair or fur and are fed milk as young. Reptiles breathe air and have scales. Fish live and breathe underwater and are vertebrates (have a backbone). Birds have a beak, two wings, feathers and two legs. Amphibians live in water as young and on land when older and have smooth, slimy skin.* • Different parts of the body are associated with different senses and name and locate these.

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	Seasonal changes	**Vocab:** Weather: wind/windy, rain/rainy, snow/snowy, sun/sunny, cloud/cloudy, storm/stormy, hurricane, thunder, lightning, gale, hailstone, fog/foggy, ice/icy, frost, clear da, freezing (melting) Seasons: winter, spring, summer, autumn. Daylight, sunlight, sunset, sunrise.
	Required prior knowledge Children should know: • Pupils name the four seasons • Pupils play and explore outside in all seasons and in different weather (reflection takes place throughout the year) • Pupils observe living things throughout the year.	End point • There are four seasons: winter, spring, summer, autumn. • The weather changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. • 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. • The earth spins every 24 hours and this is the length of a day. • In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again.

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<table>
<tr><th colspan="2">Spring</th></tr>
<tr><td>Everyday Materials</td><td>Vocab:

Absorption

Materials: wood, plastic, glass, metal, water, rock

Property (properties): hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy/not bendy, waterproof/not waterproof.</td></tr>
<tr><td><u>Required prior knowledge</u>
Children should know:
Pupils can sort materials into groups and explain how they have been sorted
Pupils will talk about why ice changes and predict what might happen next and explain why.
Pupils understand that some things float and some things sink and make predictions.
Pupils are ble to use vocabulary involved in these processes</td><td><u>End point</u>
All objects are made of one or more materials e.g. our classroom chairs are made from metal and plastic.
Some objects can be made from different materials e.g. plastic, metal or wooden spoons.
A property of a material is something about it we can measure, see or feel.
Materials can be described and grouped depending on their properties e.g. shiny, stretchy, rough etc.
Some materials e.g. plastic can be in different forms with very different properties.</td></tr>
<tr><th colspan="2">Summer</th></tr>
<tr><td>Plants</td><td>Vocab:
Leaf/leaves, flower, blossom, bulb, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, wild, garden, deciduous, evergreen, growth.</td></tr>
</table>

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	Required prior knowledge	End point
	Children should know: • Pupils name some wild plants such as dandelion, daisy, buttercup, nettles • Pupils can name some plants/flowers we plant such as beans, sunflowers, roses, • Pupils can talk about how the plant changes over time. • Pupils are able to say what a plant needs to grow.	• Pupils can name some common wild plants e.g: bluebells, brambles, buttercups, dandelions, nettles, poppies, thistles and rhododendrons. • Garden plants include: heather, dahlia, fuchsia, clematis, buddleia, lavender, pansies, roses. • Deciduous trees giant flowering plants that have leaves that change colour and fall to the ground (they shed their leaves). Examples include: oak and beech trees. • Evergreen trees keep their colour and leaves all year round. Examples include: pines, firs, cypresses and spruces. • Plants have common parts, roots, stem, leaves, but they vary between the different types of plants.

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Y2	Autumn	
	Uses of Everyday Materials	**Vocab:** Material: brick, paper, cardboard Properties: brittle, rigid, flexible/bendy, absorbent, transparent hardwearing, reflective, suitable/unsuitable, suitable/unsuitable, waterproof Verbs/movement: twist, stretch, bend, squash, push/pushing, pull/pulling.
	Required prior knowledge From Year 1, children should be able to: • Know the difference between an object and the material it is made from. • Describe the properties of materials and group materials depending on their properties. • Understand that objects can be made from different materials.	End point • All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. • When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. • A material can be suitable for different purposes and an object can be made of different materials. • Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness.

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	Spring	
	Animals Including Humans	**Vocab:** Offspring, reproduction, growth, baby, toddler, child, teenager, adult, survival, growth, metamorphosis, basic needs. Exercise, heartbeat, breathing, hygiene, germs, disease, virus, Food types: fibre, carbohydrates, protein, oils and spreads, dairy. Met, fish, grains, high-sugar.
	Required prior knowledge From Year 1, children should be able to: • Name a variety of common animals including: fish, reptiles, amphibians, birds and mammals. • Know the diet of carnivores, omnivores and herbivores and be able to identify and name animals in these categories. • Describe and compare the structure of a variety of different animals.	End point • Animals, including humans, have offspring which grow into adults. • In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. • In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. • Metamorphosis is a process some animals go through to become adults. Most amphibians go through this, including frogs, and many insects such as beetles, flies and wasps do too. • All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. • To grow into healthy adults, they also need the right amounts and types of food and exercise. Good hygiene is also important in preventing infections and illnesses, and spreading viruses and bad bacteria.

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	Living things and their Habitats	**Vocab:** Prior: deciduous, evergreen, flower, plant, tree, structure, roots, stem, leaf, trunk, flower, herbivore, carnivore, omnivore. Life cycle: birth, living, dead. Reproduction, suited, suitable, basic needs, food chain, producer, consumer, shelter, feed, habitat, microhabitat, source, nutrients, decay Environment: seashore, woodland, ocean, rainforest, desert, Polar regions, wetlands, grasslands, mountains, marine.
	<u>Required prior knowledge</u> From reception, children should be able to: • Describe what they see, hear and feel whilst outside. • Recognise and describe different environments, including describing how some environments are different to the one they live in. From Year 1, children should be able to: • Name some common wild and garden plants. • Identify and describe the basic structure of a variety of common flowering plants, including trees. • Name a variety of common animals including fish, mammals, amphibians, reptiles, birds and describe their structures.	<u>End point</u> • All objects are either living, dead or have never been alive. • Living things are plants (including seeds) and animals. • Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers. • Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. • The habitat provides the basic needs of the animals and plants – shelter, food and water. • Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. These micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect which plants and animals live there.

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		• The plants and animals in a habitat depend on each other for food and shelter. • The way that animals obtain their food from plants and other animals can be shown in a food chain.
	Summer	
	Plants	**Vocab:** Prior: leaf/leaves, flower, blossom, bulb, petal, fruit, berry, root, seed, seedling, trunk, branch, stem, bark, stalk, bud, wild, garden, deciduous, evergreen, light, shade, sun, warm, cool, water, grow, suited, conditions. Germinate, germination, healthy/healthily.
	<u>Required prior knowledge</u> From Year 1, children should be able to: • Name some common wild plants in their local area and some garden plants. • Understand that deciduous trees are large flowering plants that have leaves that change colour and fall to the ground and name some examples. • Understand that evergreen plants keep their colour and leaves all year round. • Identify the structure and basic parts of a plant.	<u>End point</u> • Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. • Seeds need water, light and a suitable temperature to germinate but most do not need light to germinate: seeds have a store of food inside them. • These mature plants may have flowers which then develop into seeds, berries, fruits etc. • Plants need light, water and a suitable temperature to grow and stay healthy. • Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. • Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.

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Y3	Autumn	
	Rocks & Fossils	**Vocab:** igneous, sedimentary, metamorphic, properties, permeable, absorbent, erosion, fossils, organic matter.
	Required prior knowledge Children should know: Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. May have some understanding of a variety of different rocks in the natural world. Some understanding of what soil is. (how to identify soil etc) May have some knowledge of what a fossil is.	End point • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties, • Describe in simple terms how fossils are formed when things that have lived are trapped within rock, • Recognise that soils are made from rocks and organic matter.
	Forces	**Vocab:** surface, friction, magnetic forces, attract, repel, magnetic, push, pull.
	Required prior knowledge Children should know: May have an awareness of how to make things stop and start, using simple pushes and pulls. They may know about floating and sinking.	End point • Compare how things move on different surfaces. • Know how a simple pulley works and use making lifting an object simpler • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract and repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet and identify some magnetic materials. • Describe magnets as having two poles.

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		• Predict whether two magnets with attract or repel each other, depending on which poles are facing.
	Spring	
	Plants	**Vocab:** roots, stem, leaves, pollination, germination, seed dispersal, fertilisation, photosynthesis, stamen, stigma.
	Required prior knowledge Children should know: Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and warmth to grow and stay healthy.	End point • Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowers • Explore the part flowers play in a flowering plants life cycle, including: pollination, seed formation and seed dispersal • Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants • Know the way in which water is transported between plants
	Light	**Vocab:** reflection, surface, shadow, transparent, translucent, opaque, artificial, energy, light source, refraction, spectrum.
	Required prior knowledge Children should know: Observed changes across the four seasons Observed and describe weather associated with the seasons and how day length varies. Children may: Have some knowledge of were light comes from. Have seen their shadows and may know they appear when it is sunny. Have some understanding of a reflection. May understand they need light to be able to see things	End point • Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by a solid object. • Find patterns in the way that the sizes of shadows change.

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	Summer	
	Animals including humans	**Vocab:** nutrients, fat, carbohydrate, protein, skeleton, protection, support, muscles, joint, movement.
	Required prior knowledge Children should know: Know that animals, including humans, have offspring which grow into adults Know the basic stages in a life cycle for animals, including humans. Find out and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	End point • Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. • Know how nutrients, water and oxygen are transported within animals and humans. • Know about the importance of a nutritious, balanced diet. • Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

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Y4	Autumn	
	Electricity	**Vocab:** circuit, component, appliance, charge, electron, battery, cell, bulb, buzzer, switch, wire, current electricity, static electricity, negative terminal, positive terminal, voltage, chemical reaction, absorption, conductor, energy, insulator, particle, property, wave.
	Required prior knowledge Children should know: May have some understanding that objects need electricity to work. May understand that a switch will turn something on or off.	End point • Identify common appliances that run on electricity. • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. • Recognise that a switch opens and closes the circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors. • Know the difference between a conductor and an insulator; giving examples of each. • Safety when using electricity.
	Sound	**Vocab:** vibration, percussion instrument, wind instrument, string instrument, frequency, volume, pitch, transverse wave, longitudinal wave, medium, vacuum, absorption, conductor, energy, insulator, particle, wave.

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	Required prior knowledge Children should know: May have some understanding that objects make different sounds. Some understanding that they use their ears to hear sounds. Know about their different senses.	End point • Know how sound is made associating some of them with vibrating. • Know what happens to a sound as it travels from its source to our ears. • Know the correlation between the volume of a sound and the strength of the vibrations that produced it. • Know how sound travels from a source to our ears. • Know the correlation between pitch and the object producing a sound.
	Spring	
	Animals including humans	**Vocab:** digestion, excretion, peristalsis, anus, duodenum, small intestine, large intestine, stomach, rectum, oesphagus, tongue, saliva, acid, bile, enzymes, incisors, canines, molars, predator, prey, producer, consumer, primary, secondary, tertiary.
	Required prior knowledge Children should know: Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. Know how nutrients, water and oxygen are transported within animals and humans. Know about the importance of a nutritious, balanced diet. Identify that humans and some other animals have skeletons and muscles for support, protection and movement	End point • Describe the simple functions of the basic parts of the digestive system in humans. • Identify the different types of teeth in humans and their simple functions. • Construct and interpret a variety of food chains, identifying producers, predators and prey

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	States of Matter	**Vocab:** bond, condensation, evaporation, reversible, boiling point, melting point, liquid, gas, thermometer, water cycle, continuous precipitation, transpiration, surface runoff process, sublimation, freezing, particle, absorption, dissolving.
	Required prior knowledge Children should know: Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties. Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	End point • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.
	Summer	
	Living things and their habitat	**Vocab:** kingdom, classification key, species, fungi, bacteria, climate change, characteristics, offspring, extinction, pollution, decay, energy, habitat, freezing plant, structure, herbivore, carnivore, omnivore, microhabitat, environment, reproduction, vertebrate

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	<u>Required prior knowledge</u> Children should know: Explore and compare the difference between things that are living, dead and things that have never been alive. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including micro habitats. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name the different sources of food.	<u>End point</u> • Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • Recognise that environments can change and that this can sometimes pose danger to living things.

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<table>
<tr><td rowspan="4">Y5</td><td colspan="2">Autumn</td></tr>
<tr><td>Earth and Space</td><td>Vocabulary:
Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation, waxing, waning, crescent, gibbous. Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar system, day, night, rotate, orbit, axis, spherical, geocentric, heliocentric.</td></tr>
<tr><td><u>Required prior knowledge</u>
From Key Stage 1 and Year 3, children should be able to:
Understand changes in weather patterns and seasons.
Compare how things move on different surfaces.
Notice that some forces need contact between two objects, but magnetic forces can act at a distance.
Describe magnets as having two poles. Predict whether two magnets with attract or repel each other, depending on which poles are facing</td><td><u>End point – Sticky knowledge:</u>
Stars, planets and moons have so much mass they attract other things, including each other due to a force called gravity. Gravity works over distance.
Objects with larger masses exert bigger gravitational forces.
Objects like planets, moons and stars spin.
Smaller mass objects like planets orbit large mass objects like stars.
Stars produce vast amounts of heat and light.
All other objects are lumps of rock, metal or ice and can be seen because they reflect the light of stars.</td></tr>
<tr><td>Animals including humans</td><td>Vocabulary:
Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, Hormone, Physical, Emotional</td></tr>
<tr><td><u>Required prior knowledge</u>
From Year 4, children should be able to:
Describe the simple functions of the basic parts of the digestive system in humans.
Identify the different types of teeth in humans and their simple functions.</td><td><u>End point – Sticky knowledge:</u>
Different animals mature at different rates and live to different ages.
Puberty is something we all go through, a process which prepares our bodies for being adults, and reproduction
Hormones control these changes; which can be physical and/or emotional.</td></tr>
</table>

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Spring

Properties and changes of materials

Vocabulary:

Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection.

Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing Material, conductor, dissolve, insoluble, suspension, chemical, physical, irreversible, solution, reversable, separate, mixture, insulator, transparent, flexible, permeable, soluble, property, magnetic, hard.

<u>Required prior knowledge</u>

From KS1, children should be able to:

- Distinguish between an object and the material from which it is made.
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- Describe the simple physical properties of a variety of everyday materials.
- Compare and group together a variety of everyday materials on the basis of their simple physical properties.
- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

From Year 4, children should be able to:

<u>End point – Sticky knowledge:</u>

- When two or more substances are mixed and remain present the mixture can be separated.
- Some changes can be reversed and some can't.
- Materials change state by heating and cooling.

Separating technique	Difference in property required
Filtration and sieving	A solid that does not dissolve in a liquid. Different sized solid bits
Magnets	Some materials magnetic others not
Evaporation	A solid dissolved in water and the solid has a high boiling temperature
Floating	Some materials float and other sink

- All matter (including gas) has mass.
- Sometimes mixed substances react to make a new substance. These changes are usually irreversible.
- Heating can sometimes cause materials to change permanently. When this happens, a new substance is made. These changes are not reversible.

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	• Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	• Indicators that something new has been made are: The properties of the material are different (colour, state, texture, hardness, smell, temperature) • If it is not possible to get the material back easily it is likely that it is not there anymore and something new has been made (irreversible change)
	Summer	
	Forces	**Vocabulary:** Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys, force, push, pull, opposing, streamline, brake, mechanism, lever, cog, machine, pulley.
	Required prior knowledge From Year 3, children should be able to: • Compare how things move on different surfaces. • Know how a simple pulley works and use making lifting an object simpler • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract and repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. • Describe magnets as having two poles. • Predict whether two magnets with attract or repel each other, depending on which poles are facing.	End point – Sticky knowledge: • Air resistance and water resistance are forces against motion caused by objects having to move air and water out of their way. • Friction is a force against motion caused by two surfaces rubbing against each other. • Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move

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	Living things and their habitat	**Vocabulary:** Reproduction, Sexual, Asexual, Pollination, Dispersal, reproduction, cell, fertilisation, pollination, male, female, pregnancy, young, mammal, metamorphosis, amphibian, insect, egg, embryo, bird, plant
	Required prior knowledge From Year 4, children should be able to: • Construct and interpret a variety of food chains, identifying producers, predators and prey • Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. • Identify and name a variety of plants and animals in their habitats, including micro habitats.	End point • Different animals mature at different rates and live to different ages. • Some organisms reproduce sexually where offspring inherit information from both parents. • Some organisms reproduce asexually by making a copy of a single parent. • Environmental change can affect how well an organism is suited to its environment. Different types of organisms have different lifecycles.

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<table>
<tr><td rowspan="4">Y6</td><td colspan="2">Autumn</td></tr>
<tr><td>Animals including humans</td><td>Vocabulary:
Oxygenated, Deoxygenated, Valve, Exercise, Respiration Circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary, digestive, transport, gas exchange, villi, nutrients, water, oxygen, alcohol, drugs, tobacco.</td></tr>
<tr><td><u>Required prior knowledge</u>
From Year 5, children should be able to:
Describe the changes as humans develop to old age.
From Year 4, children should know that:
Animals have teeth to help them eat.
Different types of teeth do different jobs.
Food is broken down by the teeth and further in the stomach and intestines where nutrients go into the blood.
The blood takes nutrients around the body.</td><td><u>End point – Sticky knowledge:</u>
The heart pumps blood around the body.
Oxygen is breathed into the lungs where it is absorbed by the blood.
Muscles need oxygen to release energy from food to do work. (Oxygen is taken into the blood in the lungs; the heart pumps the blood through blood vessels to the muscles; the muscles take oxygen and nutrients from the blood.)
Recognise the impact of diet, exercise and drugs on lifestyle.</td></tr>
<tr><td>Electricity</td><td>Vocabulary:
Electricity, neutrons, protons, electrons, nucleus, atom, electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, conductor, electrical insulator, conductor.</td></tr>
<tr><td><u>Required prior knowledge</u>
From Year 4, children should be able to:
Identify common appliances that run on electricity.
Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.
Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.</td><td><u>End point – Sticky knowledge:</u>
Batteries are a store of energy. This energy pushes electricity round the circuit. When the battery’s energy is gone it stops pushing. Voltage measures the ‘push.’
The greater the current flowing through a device the harder it works.
Current is how much electricity is flowing round a circuit.
When current flows through wires heat is released. The greater the current, the more heat is released.</td></tr>
</table>

	• Recognise that a switch opens and closes the circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors. • Know the difference between a conductor and an insulator; giving examples of each. Safety when using electricity.	• Draw diagrams using the correct electrical symbols.
	Spring	
	Light	**Vocabulary:** Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent. Reflect Absorb Emitted Scattered Refraction
	Required prior knowledge From Year 3, children should be able to: • Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by a solid object. Find patterns in the way that the sizes of shadows change.	End point – Sticky knowledge: • Animals see light sources when light travels from the source into their eyes. • Animals see objects when light is reflected off that object and enters their eyes. • Light reflects off all objects (unless they are black). Non shiny surfaces scatter the light so we don't see the beam. Relate this to how simple optical instruments are used. • Light travels in straight lines.
	Evolution and inheritance	**Vocabulary:** Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, Variation, Inherited, Environmental, Mutation, Competition, Survival of the Fittest, Evidence.
	Required prior knowledge From KS1 and KS2, children should be able to: • Understand there is a variety of life on Earth	End point • Life cycles have evolved to help organisms survive to adulthood.

Dovedale Primary School
Long term plan

Science

	• Know that some animal's differences are important to their survival • Know how animals and plants reproduce • Know how fossils form over time	• Over time the characteristics that are most suited to the environment become increasingly common. • NB: The following could be duplicated in Year 6 Living things and their habitats. • Organisms best suited to their environment are more likely to survive long enough to reproduce. Organisms are best adapted to reproduce are more likely to do so. • Organisms reproduce and offspring have similar characteristic patterns. • Variation exists within a population (and between offspring of some plants) Competition exists for resources and mates
	Summer	
	Living things and their habitat	**Vocabulary:** Variation Organisms Populations. Classification Characteristics Environment, flowering, nonflowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation. Classify, compare, bacteria, microorganism, organism, invertebrates, vertebrates, Linnaean.
	<u>Required prior knowledge</u> Children should know: From Year 4, children should be able to: • Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose danger to living things.	<u>End point – Sticky knowledge:</u> • Variation exists within a population (and between offspring of some plants) – NB: this Key Idea is duplicated in Year 6 Evolution and Inheritance. • Organisms best suited to their environment are more likely to survive long enough to reproduce. • Organisms are best adapted to reproduce are more likely to do so. • Organisms reproduce and offspring have similar characteristic patterns.

		• Competition exists for resources and mates. • Classification systems are used to organise animals and help group or identify. • Realise the importance of classification systems.