| **SCIENCE** | | | | | | | | | | |
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| **EYFS**  **Understanding the World** | | | | | | | | | | |
| **Areas of Learning** | | | | | | | | | | |
| **Autumn** | | | | **Spring** | | | | **Summer** | | |
| Work-in-progress as EYFS teacher develops the Understanding the World Curriculum  Direct Teaching  Outdoor Learning  Continuous provision & direct teaching  Educational visit & continuous provision  Outdoor learning & continuous provision | | | | | | | | | | |
| **Seasonal changes**  Understand the effect of changing seasons on the natural world around them - **autumn.**  +Explore the natural world around them.  + Know how to describe what they see, hear and feel whilst outside.  +Understand the effect of changing seasons on the natural world around them by making observations and drawing pictures of plants. | | **Humans**  Remembers and talks about significant events in their own experience - **Baby/Toddler/present day photo**  **Growth and Change**  +Talk about members of their immediate family and community.  +Name and describe people who are familiar to them.  Recognise some similarities and differences between life in this country and life in other countries. **- Polar regions/Arctic - how do animals keep warm? Blubber experiment**  **States of Matter**  Understand some important processes and changes in the natural world around them including seasons and states of matter  +Describe what they see, hear and feel whilst outside - winter walk.  **Seasonal changes**  Understand the effect of changing seasons on the natural world around them - **winter**  +Explore the natural world around them.  + Know how to describe what they see, hear and feel whilst outside.  +Understand the effect of changing seasons on the natural world around them by making observations plants, comparing with last half-term - observing over time (WS). | | **Seasonal changes**  Understand the effect of changing seasons on the natural world around them - **winter**  **Planting seeds ready for summer observations**  +Explore the natural world around them.  + Know how to describe what they see, hear and feel whilst outside.  +Understand the effect of changing seasons on the natural world around them.  **Understanding important processes and changes in the natural world around us (ELG)**  Make observations of animals and plants and explain why some things occur, and talk about changes  **- Grow fruits and vegetables in our outdoor area. What do they need to grow?**  Educational visit to ‘Imagine That’ & continuous provision  **Seasonal changes**  Understand the effect of changing seasons on the natural world around them - **spring**  +Explore the natural world around them.  + Know how to describe what they see, hear and feel whilst outside.  +Understand the effect of changing seasons on the natural world around them by making observations and drawing pictures of plants. | | | | **Materials, including changing materials**  Materials - **Explore different materials and their properties**  +Explore the natural world around them.  +Describe what they see, hear and feel whilst outside.  **Forces**  Floating and sinking - **What Floats in a Moat focus text and activity**  +Explore the natural world around them.  +Describe what they see, hear and feel whilst outside.  **Living things and their habitats**  Explore the natural world around them, making observations and drawing pictures of animals and plants **-Minibeast hunt, Minibeast habitats, observational drawings and small world exploration. Observing ducklings and chicks over time - working with Y2, contrasting features.**  Know some similarities and differences between the natural world around them and contrasting environments, - **Bug hotel; what do we need to include for each minibeast?**  +Draw information from a simple map.  +Explore the natural world around them.  +Describe what they see, hear and feel whilst outside.  + Recognise some environments that are different to the one in which they live. | | **Animals, excluding humans**  **African animals and habitats - small world and non-fiction texts**  +Recognise some environments that are different to the one in which they live.  **Seasonal changes**  Understand the effect of changing seasons on the natural world around them - **summer**  +Explore the natural world around them.  + Know how to describe what they see, hear and feel whilst outside.  +Understand the effect of changing seasons on the natural world around them. |
| **Vocabulary** | | | | | | | | | | |
|  | | Model and encourage children to use vocabulary such as: hair (black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly), eyes (blue, brown, green, grey), skin (black, brown, white), big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family, boy, girl, man, woman  Expose children to supplementary vocabulary such as: bald, elderly, wrinkles, male, female, freckles  Expose children to supplementary vocabulary such as: solid, liquid, gas, most suited  Model and encourage children to use vocabulary such as: Sun, sunny, light, shadow, shady, clouds, torch, see-through, non-see through, source, light source | | Model and encourage children to use vocabulary such as: ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back | | | | Model and encourage children to use vocabulary such as: float, sink, up, down, top, bottom, surface, move, roll, drop, fly, turn, spin, fall, fast, slow, faster, slower, fastest, slowest, further, furthest, wind, air, water, blow, bounce Expose children to supplementary vocabulary such as: force, rotate, solid, liquid, gravity  Model and encourage children to use vocabulary such as: plant, tree, bush, flower, vegetable, herb, weed, animal, names of plants and animals they see, name of a contrasting environment e.g. beach, forest  Expose children to supplementary vocabulary such as: environment | | Model and encourage children to use vocabulary such as: names of animals, live, on land, in water, jungle, desert, North Pole, South Pole, sea, hot, cold, wet, dry, snow, ice  Expose children to supplementary vocabulary such as: environment, polar regions, ocean, camouflage |
| Seasonal changes vocab: spring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers  Expose children to supplementary vocabulary such as:hibernate, migrate, snowflake | | | | | | | | | | |
| **Opportunities for Links in Learning** | | | | | | | | | | |
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| **Science** | | | | | | | | | | |
| **Year 1**  **National Curriculum** | | | | | | | | | | |
| **Areas of Learning** | | | | | | | | | | |
| **Previous Learning:**  Name and describe people who are familiar to them. (Reception - Humans)  **Common misconceptions:**  Some children may think:  • only four-legged mammals, such as pets, are animals  • humans are not animals | **Previous Learning:**  Explore the natural world around them. (Reception – Seasonal changes)  Describe what they see, hear and feel whilst outside. (Reception – Seasonal changes)  Understand the effect of changing seasons on the natural world around them. (Reception – Seasonal changes)  **Common misconceptions:**  Some children may think:  • it always snows in winter  • it is always sunny in the summer  • there are only flowers in spring and summer  • it rains most in the winter. | | **Previous Learning:**  Exploring different materials and their properties in Investigation Area  **Common misconceptions:**  Some children may think:  • only fabrics are materials  • only building materials are materials  • only writing materials are materials  • the word ‘rock’ describes an object rather than a material  • ‘solid’ is another word for hard. | | **Previous Learning:**  Explore the natural world around them. (Reception – Seasonal changes)  Describe what they see, hear and feel whilst outside. (Reception – Seasonal changes)  Understand the effect of changing seasons on the natural world around them. (Reception – Seasonal changes)  **Common misconceptions:**  Some children may think:  • it always snows in winter  • it is always sunny in the summer  • there are only flowers in spring and summer  • it rains most in the winter. | | **Previous Learning:**  Explore the natural world around them. (Reception – Living things and their habitats)  Recognise some environments that are different to the one in which they live. (Reception – Living things and their habitats)  **Common misconceptions:**  Some children may think:  •plants are flowering plants grown in pots with coloured petals and leaves and a stem  •trees are not plants  •all leaves are green  •all stems are green  •a trunk is not a stem  •blossom is not a flower. | | **Previous Learning:**  Name and describe people who are familiar to them. (Reception - Humans)  **Common misconceptions:**  Some children may think:  •only four-legged mammals, such as pets, are animals  •humans are not animals  •insects are not animals  •all ‘bugs’ or ‘creepy crawlies’, such as spiders, are part of the insect group  •amphibians and reptiles are the same. | |
| **Autumn** | | | | **Spring** | | | | **Summer** | | |
| **Animals inc. Humans:**  **Exploring senses**  **Specific Knowledge-**  +Know that humans (and other animals) find out about the world using their senses.  +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 humans have key parts in common, but these vary from person to person.  +Know that humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body. | | **Seasonal changes - Autumn/Winter**  **Specific Knowledge-**  +Observe changes across the four seasons.  +Observe and describe weather associated with the seasons and how day length varies.  +Know that 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. +Know that the weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer.  +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. | | **Everyday materials**  **Specific Knowledge-**  +Distinguish between an object and the material from which it is made.  +Know how to 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.  +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. +Know that materials can be described by their properties e.g. shiny, stretchy, rough etc.  +Know that some materials e.g. plastic can be in different forms with very different properties. | | **Seasonal changes - Spring/Summer**  **Specific Knowledge-**  +Observe changes across the four seasons.  +Observe and describe weather associated with the seasons and how day length varies.  +Know that 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.  +Know that the weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer.  +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. | | **Plants**  **Specific Knowledge-**  +Know that there are a vast variety of plants which all have specific names and can be identified by looking at the key characteristics of the plant.  +Know that plants have common parts, but they vary between the different types of plants.  +Know that some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring.  + Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.  +Identify and describe the basic structure of a variety of common flowering plants, including trees. | | **Animals inc. Humans:**  **Animals**  **Specific Knowledge-**  +Know that animals vary in many ways having different structures e.g. wings, tails, ears etc.  +Know that animals also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them.  +Know that animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals.  +Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.  +Know, identify and name a variety of common animals that are carnivores, herbivores and omnivores.  +Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). |
| **Vocabulary** | | | | | | | | | | |
| Parts of the body including those linked to PSHE teaching (see joint document produced by the ASE and PSHE Association)  Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue  N.B. Although we often use our fingers and hands to feel objects, the children should understand that we can feel with many parts of our body. | | Weather (sunny, rainy, windy, snowy etc.), seasons (autumn, winter), sun, sunrise, sunset, day length | | Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through | | Weather (sunny, rainy, windy, snowy etc.), seasons (spring, summer), sun, sunrise, sunset, day length | | Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, names of trees in the local area, names of garden and wild flowering plants in the local area | | Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves  Names of animals experienced first-hand from each vertebrate group  N.B. The children need to be able to name and identify a range of animals in each group e.g. name specific birds and fish. They do not need to use the terms mammal, reptiles etc. or know the key characteristics of each, although they will probably be able to identify birds and fish, based on their characteristics. The children also do not need to use the words carnivore, herbivore and omnivore. If they do, ensure that they understand that carnivores eat other animals, not just meat. |
| **Opportunities for Links in Learning** | | | | | | | | | | |
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| **Science** | | | | | |
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| **Year 2**  **National Curriculum** | | | | | |
| **Areas of Learning** | | | | | |
| **Previous Learning:**  Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)  Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)  **Common misconceptions:**  Some children may think:  • an animal’s habitat is like its ‘home’  • all animals that live in the sea are fish  • respiration is breathing  • breathing is respiration. | | **Previous Learning:**  Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)  Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)  Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)  Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)  **Common misconceptions:**  Some children may think:  • only fabrics are materials  • only building materials are materials  • only writing materials are materials  • the word rock describes an object rather than a material  • solid is another word for hard. | | **Previous Learning:**  Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants)  Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)  **Common misconceptions:**  Some children may think:  • plants are not alive as they cannot be seen to move  • seeds are not alive  • all plants start out as seeds  • seeds and bulbs need sunlight to germinate. | **Previous Learning:** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)  Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans)  Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans)  Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans)  Observe changes across the four seasons. (Y1 - Seasonal changes)  **Common misconceptions:**  Some children may think:  • an animal’s habitat is like its ‘home’  • plants and seeds are not alive as they cannot be seen to move  • fire is living  • arrows in a food chain mean ‘eats’. |
| **Autumn** | | **Spring** | | **Summer** | |
| **Animals including humans**  **Specific Knowledge-**  +Know that animals, including humans, have offspring which grow into adults.  +Know that 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.  +Know that the young of some animals do not look like their parents e.g. tadpoles.  +Know that all animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive.  +Know that 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. | | **Uses of everyday materials**  **Specific Knowledge-**  +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 that all objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water.  +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.  +Know that a material can be suitable for different purposes and an object can be made of different materials.  +Know that 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. | | **Plants**  **Specific Knowledge-**  +Observe and describe how seeds and bulbs grow into mature plants. +Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.  +Know that plants may grow from either seeds or bulbs and that these then germinate and grow into seedlings which then continue to grow into mature plants.  +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.  +Know that 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. | **Living Things and their Habitats Specific Knowledge- +**Explore and compare the differences between things that are living, dead, and things that have never been alive  +Know a variety of plants and animals and identify them in their habitats, including micro-habitats  +Know 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  +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 (This is a simplification, but appropriate for Year 2)  +Know that an object made of wood is classed as dead.  +Know that objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil fuels).  +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.  +Know that 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.  +micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect which plants and animals live there. +Know that plants and animals in a habitat depend on each other for food and shelter etc.  +Know the way that animals obtain their food from plants and other animals can be shown in a food chain. |
| **Vocabulary** | | | | | |
| Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta) | | Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard.  Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, nonreflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching | | From Y1 - Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, names of trees in the local area, names of garden and wild flowering plants in the local area  light, shade, sun, warm, cool, water, grow, healthy | Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland etc, names of micro-habitats e.g. under logs, in bushes etc. |
| **Opportunities for Links in Learning** | | | | | |
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| **Science** | | | | | |
| **Year 3**  **National Curriculum** | | | | | |
| **Areas of Learning** | | | | | |
| **Previous Learning:** Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)   Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)  **Common misconceptions:**  Some children may think:  • rocks are all hard in nature  • rock-like, man-made substances such as concrete or brick are rocks  • materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer ‘natural’  • certain found artefacts, like old bits of pottery or coins, are fossils  • a fossil is an actual piece of the extinct animal or plant  • soil and compost are the same thing. | | **Previous Learning:**  Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals, including humans)  Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)  Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 - Animals, including humans)  Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans)  Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans)  **Common misconceptions:**  Some children may think:  • certain whole food groups like fats are ‘bad’ for you  • certain specific foods, like cheese are also ‘bad’ for you  • diet and fruit drinks are ‘good’ for you  • your stomach is where your belly button is  • food is digested only in the stomach  • when you have a meal, your food goes down one tube and your drink down another  • the food you eat becomes “poo” and the drink becomes “wee”. | **Previous Learning:**  Explore the natural world around them. (Reception – Forces) Describe what they see, hear and feel whilst outside. (Reception – Forces)  Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)  **Common misconceptions:**  Some children may think:  • the bigger the magnet the stronger it is  • all metals are magnetic. | **Previous Learning:** Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants)  Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants)  **Common misconceptions:**  Some children may think:  • plants eat food  • food comes from the soil via the roots  • flowers are merely decorative rather than a vital part of the life cycle in reproduction  • plants only need sunlight to keep them warm  • roots suck in water which is then sucked up the stem. | **Previous Learning:** Describe what they see, hear and feel whilst outside. (Reception – Light)  Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials)  **Common misconceptions:**  Some children may think:  • we can still see even where there is an absence of any light  • our eyes ‘get used to’ the dark  • the moon and reflective surfaces are light sources  • a transparent object is a light source  • shadows contain details of the object, such as facial features on their own shadow  • shadows result from objects giving off darkness. |
| **Autumn** | | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Rocks**  **Specific Knowledge -**  +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.  +Know that rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. +Know that rocks can be hard or soft.  +Know that they have different sizes of grain or crystal.  +Know that they may absorb water.  +Know that rocks can be different shapes and sizes (stones, pebbles, boulders).  +Know that soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter).  +Know that the type of rock, size of rock pieces and the amount of organic matter affect the property of the soil.  +Know that some rocks contain fossils.  +Know that fossils were formed millions of years ago.  +Know that 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. | | **Animals including Humans**  **Specific Knowledge -**  +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 that a piece of food will often provide a range of nutrients.  +Know that humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing).  +Know that food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. +Know that the food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added. The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet. | **Forces and magnets**  **Specific Knowledge -**  + Compare how things move on different surfaces.  +Observe how magnets attract or repel each other and attract some materials and not others.  +Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.  +Describe magnets as having two poles.  +Predict whether two magnets will attract or repel each other, depending on which poles are facing.  +Know that a force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It 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 a magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract.  +Know that for some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts | **Plants**  **Specific Knowledge -**  +Know and describe the functions of different parts of flowering plants: roots; stem/trunk; leaves; and flowers.  +Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.  +Investigate the way in which water is transported within plants.  +Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.  + Know that many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom.  + Know the roots absorb water and nutrients from the soil and anchor the plant in place.  + Know that the stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal.  + Know that leaves use sunlight and water to produce the plant’s food. Some plants produce flowers which enable the plant to reproduce.  + Know that pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways.  + Know that different plants require different conditions for germination and growth. | **Light Specific Knowledge -  +**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.  +Find patterns in the way that the size of shadows change. +Know we see objects because our eyes can sense light.  +Know that dark is the absence of light.  +Know we cannot see anything in complete darkness.  +Know that some objects, for example, the sun, light bulbs and candles are sources of light.  +Know that objects are easier to see if there is more light.  +Know that some surfaces reflect light.  +Know that objects are easier to see when there is less light if they are reflective.  +Know that the light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. +Know that shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light.  +Know that the size of the shadow depends on the position of the source, object and surface. |
| **Vocabulary** | | | | | |
| Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil | | Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore | Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole | Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersa | Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous |
| **Opportunities for Links in Learning** | | | | | |
|  |  | DT- soup |  |  |  |
| **Science** | | | | | |
| **Year 4** | | | | | |
| **Areas of Learning**  **NB. revisit Aut 1 in summer term** | | | | | |
| **Previous Learning:** Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 - Animals, including humans)  Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans)  Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)  **Common misconceptions:**  Some children may think:  • arrows in a food chains mean ‘eats’  • the death of one of the parts of a food chain or web has no, or limited, consequences on the rest of the chain  • there is always plenty of food for wild animals  • snakes are similar to worms, so they must also be invertebrates  • invertebrates have no form of skeleton. | **Previous Learning:**  N/A  **Common misconceptions:**  Some children may think:  • electricity flows to bulbs, not through them  • electricity flows out of both ends of a battery  • electricity works by simply coming out of one end of a battery into the component. | **Previous Learning:**  Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)  Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)  Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)  Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)  Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)  Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)  **Common misconceptions:**  Some children may think:  • ‘solid’ is another word for hard or opaque  • solids are hard and cannot break or change shape easily and are often in one piece  • substances made of very small particles like sugar or sand cannot be solids  • particles in liquids are further apart than in solids and they take up more space • when air is pumped into balloons, they become lighter  • water in different forms – steam, water, ice – are all different substances  • all liquids boil at the same temperature as water (100 degrees)  • melting, as a change of state, is the same as dissolving  • steam is visible water vapour (only the condensing water droplets can be seen) | | **Previous Learning:**  Describe what they see, hear and feel whilst outside. (Reception – Sound)  Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)  **Common misconceptions:** Pitch and volume are frequently confused, as both can be described as high or low.  Some children may think:  • sound is only heard by the listener  • sound only travels in one direction from the source  • sound can’t travel through solids and liquids  • high sounds are load and low sounds are quiet. | **Previous Learning:** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants)   Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)  Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans)  Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)  **Common misconceptions:**  Some children may think:  • the death of one of the parts of a food chain or web has no or limited consequences on the rest of the chain  • there is always plenty of food for wild animals  • animals are only land-living creatures  • animals and plants can adapt to their habitats, however they change • all changes to habitats are negative. |
| **Autumn** | **Autumn** | **Spring** | | **Summer** | **Summer** |
| **Animals Including Humans-Skeletons and Muscles**  **Specific Knowledge-** +humans and other animals have skeletons and muscles for support, protection and movement  + name and roles of skull rib spine  +that joints help us move and provide protection and support  +that different animals have different types of skeletons and how this helps them to move (endoskeleton, exoskeleton, hydrostatic)  +what is food chain is  +us the terms producer, predator, prey,  +how draw a food chain | **Electricity**  **Specific Knowledge-**  +household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. + An electrical circuit consists of a cell or battery connected to a component using wires.  +If there is a break in the circuit, a loose connection or a short circuit, the component will not work.  + A switch can be added to the circuit to turn the component on and off.  +Metals are good conductors so they can be used as wires in a circuit.  +Non-metallic solids are insulators except for graphite (pencil lead). +Water, if not completely pure, also conducts electricity. | **States of matter**  **Specific Knowledge-**  +Compare and group materials together, according to whether they are 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 °C  +Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.  +Know that a solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. 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.  +Know that melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0°C. 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. Water boils when it is heated to 100°C. 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 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 drain back into rivers etc. This is known as precipitation. This is the water cycle. | | **Sound**  **Specific Knowledge- +**Identify how sounds are made, associating some of them with something vibrating.  +Find patterns between the pitch of a sound and features of the object that produced it.  +Find patterns between the volume of a sound and the strength of the vibrations that produced it. +Recognise that sounds get fainter as the distance from the sound source increases.  +Know that a sound produces vibrations which travel through a medium from the source to our ears.  +Know that different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter).  +Know that the vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.  +Know that the loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively.  +Know that pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds. | **Living things & their habitats Specific Knowledge-** +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 dangers to living things. +Know that living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things. +Know that living things live in a habitat which provides an environment to which they are suited (Y2 learning). These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature reserves) or in a bad way (i.e. negative human impact, such as littering). These environments also change with the seasons; different living things can be found in a habitat at different times of the year. |
| **Vocabulary** | | | | | |
| skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine, herbivore, carnivore, omnivore, producer, predator, prey, food chain | Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol | Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle | | Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation | Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate |
| **Opportunities for Links in Learning** | | | | | |
|  | DT - Santa’s Sleigh | Water cycle - Y3 geography |  |  |  |
| **Science** | | | | | |
| **Year 5**  **National Curriculum** | | | | | |
| **Areas of Learning** | | | | | |
| **Previous Learning:**  Explore the natural world around them. (Reception – Earth and space)  Describe what they see, hear and feel whilst outside. (Reception – Earth and space)  Observe changes across the four seasons. (Y1 - Seasonal changes) Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)  **Common misconceptions:**  Some children may think:  • the Earth is flat  • the Sun is a planet  • the Sun rotates around the Earth • the Sun moves across the sky during the day  • the Sun rises in the morning and sets in the evening  • the Moon appears only at night  • night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth. | **Previous Learning:** Compare how things move on different surfaces. (Y3 - Forces and magnets)  Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets) Observe how magnets attract or repel each other and attract some materials and not others. (Y3 - Forces and magnets)   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. (Y3 - Forces and magnets)  Describe magnets as having two poles. (Y3 - Forces and magnets) Predict whether two magnets will attract or repel each other, depending on which poles are facing. (Y3 - Forces and magnets)  **Common misconceptions:**  Some children may think: • the heavier the object the faster it falls, because it has more gravity acting on it  • forces always act in pairs which are equal and opposite  • smooth surfaces have no friction • objects always travel better on smooth surfaces  • a moving object has a force which is pushing it forwards and it stops when the pushing force wears out • a non-moving object has no forces acting on it  • heavy objects sink and light objects float. | **Previous Learning:**  Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)  Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)  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. (Y3 - Forces and magnets)  Compare and group materials together, according to whether they are solids, liquids or gases. (Y4 - States of matter)  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). (Y4 - States of matter)  Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. (Y4 - States of matter)  **Common misconceptions:**  Lots of misconceptions exist around reversible and irreversible changes, including around the permanence or impermanence of the change. There is confusion between physical/chemical changes and reversible and irreversible changes. They do not correlate simply. Chemical changes result in a new material being formed. These are mostly irreversible. Physical changes are often reversible but may be permanent. These do not result in new materials e.g. cutting a loaf of bread. It is still bread, but it is no longer a loaf. The shape, but not the material, has been changed.  Some children may think:  • thermal insulators keep cold in or out  • thermal insulators warm things up  • solids dissolved in liquids have vanished and so you cannot get them back • lit candles only melt, which is a reversible change. | | **Previous Learning:**  Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)  Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)  **Common misconceptions:**  Some children may think:  • all plants start out as seeds  • all plants have flowers  • plants that grow from bulbs do not have seeds  • only birds lay eggs. | **Previous Learning:** Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)  **Common misconceptions:**  Some children may think:  • a baby grows in a mother’s tummy  • a baby is “made”. |
| **Autumn** | **Autumn** | **Spring** | | **Summer** | **Summer** |
| **Earth and Space**  **Specific Knowledge- +**Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. +Describe the movement of the Moon relative to the Earth. +Describe the Sun, Earth and Moon as approximately spherical bodies. +Use 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 Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). +Know that planets travel around the Sun in fixed orbits.  +Know that Earth takes 365¼ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates, the Sun appears to move across the sky.  +Know that the Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun, Earth and Moon are approximately spherical. | **Forces**  **Specific Knowledge-**  +Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.  +Know and explain that a force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.  +Know that air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object.  +Identify the effect air resistance, water resistance and friction may have on these surfaces.  +Know that a mechanism is a device that allows a small force to be increased to a larger force. The payback is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines. | **Properties and changes of materials**  **Specific Knowledge- +**Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.  +Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.  +Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.  +Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. +Demonstrate that dissolving, mixing and changes of state are reversible changes.  +Explain 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 materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment.  +Know that some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible. | | **Living things and their habitats**  **Specific 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. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis.  +Know that plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects. | **Animals, including humans Specific Knowledge-** +Describe the changes as humans develop to old age. +Know that when babies are young, they grow rapidly. They are very dependent on their parents. As they develop, they learn many skills.  +Know that at puberty, a child’s body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce. This needs to be taught alongside PSHE (Jigsaw).  The new statutory requirements for relationships and health education can be found below:  • statutory guidance on Physical health and mental wellbeing (primary and secondary). |
| **Vocabulary** | | | | | |
| Earth, Sun, Moon, sphere, circle, evidence, flat, round. star, planet, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune. orbit, rotate, heliocentric, geocentric. day, night, rotate, axis, shadow, time, countries, daylight, night time, distance, light, dark, rotate, face, spherical, solar system, star, planets | Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears | Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material | | Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings | Puberty – the vocabulary to describe sexual characteristics: egg, sperm, fetus, baby, toddler, child, teenager, adult, old age, development, growth, human, infancy, childhood, adulthood, adolescence, prenatal, data, tables, bar graphs, line graphs, present, findings, information, height, mass. puberty, changes, breasts, pubic hair, hips, facial hair, body hair, genitals, muscular development, menstruation, old age, development, growth rate, decrease, changes, compare. gestation, animals, vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, protozoa, coelenterates, flatworms, annelid worms, echinoderms, molluscs, arthropods, arachnids, crustaceans, insects, myriapods, life expectancy, gestation, animals, variable, association, causal relationship, correlation, positive, negative. |
| **Opportunities for Links in Learning** | | | | | |
|  | | | | | |
| **Science** | | | | | |
| **Year 6**  **National Curriculum** | | | | | |
| **Areas of Learning** | | | | | |
| **Autumn** | **Autumn** | **Spring** | **Spring** | **Summer** | **Summer** |
| **Living Things and their habitats Specific Knowledge-**  +Give reasons for classifying plants and animals based on specific characteristics.  +Know that and describe how living things can be formally grouped according to characteristics. Plants and animals are two main groups but there are other living things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. Plants can make their own food whereas animals cannot.  +Know that animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). +Know that vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics.  +Know that invertebrates can be divided into a number of groups, including insects, spiders, snails and worms. +Know that plants can be divided broadly into two main groups: flowering plants; and non-flowering plants. | **Evolution and Inheritance**  **Specific Knowledge-**  +Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.  +Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.  +Know that all living things have offspring of the same kind, as features in the offspring are inherited from the parents. Due to sexual reproduction, the offspring are not identical to their parents and vary from each other.  +Know that plants and animals have characteristics that make them suited (adapted) to their environment. If the environment changes rapidly, some variations of a species may not suit the new environment and will die. 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 inherited characteristics become more dominant within the population. Over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. This is evolution.  +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. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics. | **Light**  **Specific Knowledge-**  +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.  +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 light appears to travel in straight lines, and we see objects when light from them goes into our eyes. The light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen. +Know that objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object. | **Animals including humans**  **Specific Knowledge-**  +Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.  +Know that the heart pumps blood in the blood vessels around to the lungs.  +Know that oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body.  +Know that this is the human circulatory system. | **Animals including humans**  **Specific Knowledge-** +Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.  +Describe the ways in which nutrients and water are transported within animals, including humans.  +Know that diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well our 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 some conditions are caused by deficiencies in our diet e.g. lack of vitamins. | **Electricity**  **Specific Knowledge- +**Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.  +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 how to use recognised circuit symbols when representing a simple circuit in a diagram. +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. If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well. |
| **Vocabulary** | | | | | |
| Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering | Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils | Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, straight lines, light rays | Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system | Diet, exercise, drugs, lifestyle | Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage N.B. Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words “cells” and “batteries” are now used interchangeably. |

| **Working scientifically Reception** | Aut 1 | Aut 2 | Spr 1 | Spr 2 | Sum1 | Sum2 |
| --- | --- | --- | --- | --- | --- | --- |
| asking simple questions and recognising that they can be answered in different ways | TAPS: [Brown apples](https://pstt.org.uk/application/files/7415/7538/2068/P1-2_Brown_apples_-_Predict.docx) |  |  |  |  |  |
| performing simple tests |  | TAPS: [Incy spider shelter](https://pstt.org.uk/application/files/7215/1957/4767/Rplan_SciDT_-_Incy_Shelter.docx) |  |  |  |  |
| observing closely, using simple equipment |  |  | TAPS: [Frozen balloons](https://pstt.org.uk/application/files/4115/1957/4782/Rplan_Materials_-_Frozen_balloons.docx) | Observing caterpillars & chicken eggs hatching. |  |  |
| gathering and recording data to help in answering questions |  |  |  |  | TAPS: [Scavenger sort](https://pstt.org.uk/application/files/1315/7683/9228/P1-2_Scavenger_sort_-_Doing.docx) |  |
| identifying and classifying |  |  |  |  |  | TAPS: [Butter](https://pstt.org.uk/application/files/9815/7683/8804/P1-2_Butter_-_RecCom.docx) |
| using their observations and ideas to suggest answers to questions |  | Blubber experiment |  | TAPS: [Taste test](https://pstt.org.uk/application/files/3715/7538/2500/P1-2_Taste_Test_-_Evaln.docx) |  |  |

| **Working scientifically Y1** | Aut 1 | Aut 2 | Spr 1 | Spr 2 | Sum1 | Sum2 |
| --- | --- | --- | --- | --- | --- | --- |
| asking simple questions and recognising that they can be answered in different ways | touch test guessing/describing objects from a feely bag |  | TAPS: [Materials: transparency](https://pstt.org.uk/application/files/4815/1957/4761/Y1plan_Materials_-_Transparency.docx)] |  |  | similarities and differences of animals |
| performing simple tests | touch test guessing/describing objects from a feely bag |  | TAPS: [Materials floating & sinking](https://pstt.org.uk/application/files/8815/8825/1019/Y1plan_Float_and_sink_2020.docx) |  |  |  |
| observing closely, using simple equipment |  | observing and recording the weather |  | observing and recording the weather | TAPS: [Plants: structure, leaf look](https://pstt.org.uk/application/files/9615/1957/4767/Y1plan_Plants_-_Leaf_look.docx) |  |
| gathering and recording data to help in answering questions |  |  |  | TAPS: [Season: seasonal change](https://pstt.org.uk/application/files/3815/8832/3226/Y1plan_Seasonal_change_2020.docx) | Measuring the height of their growing beans |  |
| identifying and classifying |  |  |  |  | grouping seeds and bulbs | TAPS: [Animal classification](https://pstt.org.uk/application/files/3615/8825/0974/Y1plan_Animal_classn_2020.docx) |
| using their observations and ideas to suggest answers to questions | TAPS: [Body parts](https://pstt.org.uk/application/files/5215/8825/0910/Y1plan_Body_parts_2020.docx) | observing and recording the weather |  | observing and recording the weather |  |  |

| **Working scientifically Y2** | Aut | | Spr | | Sum1 | Sum2 |
| --- | --- | --- | --- | --- | --- | --- |
| asking simple questions and recognising that they can be answered in different ways | What impact does exercise have on the body?  TAPS: [Separating colours](https://pstt.org.uk/application/files/1215/7538/2876/P3-4_Separating_colours_-_Q.docx)  (link to Art) | |  | |  |  |
| performing simple tests | Why and when would you wash your hands? | |  | | TAPS: [Daisy footprints](https://pstt.org.uk/application/files/9815/8747/0119/P3-4_Daisies_in_a_footprint_-_Predict.docx) |  |
| observing closely, using simple equipment |  | | TAPS [Ice escape:](https://pstt.org.uk/application/files/2415/7683/9379/P3-4_Ice__Escape_-_Doing.docx) | |  |  |
| gathering and recording data to help in answering questions | How much water do you drink each day? | | TAPS: [Materials hunt](https://pstt.org.uk/application/files/7215/8747/0616/Y2plan_Materials_hunt.docx) | |  |  |
| identifying and classifying | How can we sort foods into groups? | |  | |  | TAPS: [Living things: nature spotters](https://pstt.org.uk/application/files/6515/8825/1265/Y2plan_Nature_spotters_2020.docx) |
| using their observations and ideas to suggest answers to questions | TAPS: [Animals inc H: handspans](https://pstt.org.uk/application/files/8315/8832/3108/Y2plan_Handspans_2020.docx) | | How can the shape of solid objects made from some materials be changed ? | |  |  |

| **Working Scientifically Y3** | Aut 1 | Aut 2 | Spr 1 | Spr 2 | Sum1 | Sum2 |
| --- | --- | --- | --- | --- | --- | --- |
| asking relevant questions and using different types of scientific enquiries to answer them | rock suitability | soil permeability | Teeth Investigation | TAPS: [Cupcake parachutes](https://pstt.org.uk/application/files/3515/7538/2655/P3-4_Cupcake_parachutes_-_Plan.docx) |  |  |
| setting up simple practical enquiries, comparative and fair tests |  | soil formation |  | TAPS:[Forces: shoe grip](https://pstt.org.uk/application/files/7115/8825/7088/Y3plan_Shoe_grip_2020.docx) or [Forces: magnet tests](https://pstt.org.uk/application/files/8615/8825/9400/Y3plan_Magnet_tests_2020.docx) |  |  |
| making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers |  |  |  | Magnet strength | TAPS: [Plants: measuring plants](https://pstt.org.uk/application/files/2415/8825/9480/Y3plan_Measuring_plants_2020.docx) |  |
| gathering, recording, classifying and presenting data in a variety of ways to help in answering questions  recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables |  |  |  |  |  | TAPS: [Light: making shadows](https://pstt.org.uk/application/files/6615/8825/9430/Y3plan_Make_shadows_2020.docx) |
| reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions  identifying differences, similarities or changes related to simple scientific ideas and processes | TAPS: [Rocks: rock reports](https://pstt.org.uk/application/files/2315/8825/9536/Y3plan_Rocks_report_2020.docx) | TAPS: [Eco action](https://pstt.org.uk/application/files/6915/7683/9593/P3-4_Eco_action_-_RecCom.docx) |  |  |  |  |
| using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions  using straightforward scientific evidence to answer questions or to support their findings. |  |  | Digestion examples  TAPS: [Animals inc H: teeth(eggs) in liquid](https://pstt.org.uk/application/files/6515/8825/9966/Y4plan_Teeth_in_liquid_2020.docx) |  |  |  |

| **Working Scientifically Y4** | Aut 1 | Aut 2 | Spr 1 | Spr 2 | Sum1 | Sum2 |
| --- | --- | --- | --- | --- | --- | --- |
| asking relevant questions and using different types of scientific enquiries to answer them | Bone growth survey | TAPS: [Animals inc Humans: investigating skeletons](https://pstt.org.uk/application/files/8715/8825/7023/Y3plan_Skeleton_Qs_2020.docx) | Muffling sounds | Thermometers | TAPS  [Sound: investigating pitch](https://pstt.org.uk/application/files/6215/8826/0467/Y4plan_Pitch_2020.docx) temporary |  |
| setting up simple practical enquiries, comparative and fair tests |  | Conductors & insulators | TAPS  [Materials: drying materials](https://pstt.org.uk/application/files/9315/8826/0403/Y4plan_Drying_2020.docx) | Temperature |  |  |
| making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers | Skeleton Types | TAPS: [Electricity: Circuit products](https://pstt.org.uk/application/files/3415/1957/4881/Y4plan_SciDT_-_Circuit_products.docx) | Sound data logging | Thermometers | Invertebrate hunt |  |
| gathering, recording, classifying and presenting data in a variety of ways to help in answering questions  recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables | Bone growth survey |  | Muffling sounds | Evaporation Temperature | Vertebrates  Habitat survey | TAPS: [Living things: local survey](https://pstt.org.uk/application/files/8415/8826/0367/Y4plan_Local_survey_2020.docx) |
| reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions  identifying differences, similarities or changes related to simple scientific ideas and processes |  | Switches | Muffling sound letter Alter pitch & loudness | Investigating properties, freezing & condensation | Environmental change  TAPS: [Sound: string telephones](https://pstt.org.uk/application/files/5415/8826/0500/Y4plan_String_phones_2020.docx) |  |
| using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions  using straightforward scientific evidence to answer questions or to support their findings. | Bone growth survey | Working circuit | How sound is made | Water as it is being heated  TAPS: [Materials: Dunking biscuits](https://pstt.org.uk/application/files/3315/1957/4790/Y4plan_Materials_-_Dunking_biscuits.docx) | Vertebrates Invertebrate hunt |  |

| **Working Scientifically Y5** | Aut 1 | Aut 2 | Spr 1 | Spr 2 | Sum1 | Sum2 |
| --- | --- | --- | --- | --- | --- | --- |
| planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary |  |  | Parachute investigation | TAPS:  [Mat: dissolving](https://pstt.org.uk/application/files/6515/8826/0786/Y5plan_Dissolving_2020.docx) | Asexual and sexual reproduction |  |
| using test results to make predictions to set up further comparative and fair tests |  |  |  | Flood Lights  TAPS: [Materials: insulation layers](https://pstt.org.uk/application/files/2015/8826/0817/Y5plan_Insulation_layers_2020.docx) |  | Lunchbox Design |
| taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate |  |  | Soluble or insoluble? |  |  | TAPS: [Humans: growth survey](https://pstt.org.uk/application/files/9415/8826/0612/Y5plan_Growth_survey_2020.docx) |
| recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs | TAPS: [Space: craters](https://pstt.org.uk/application/files/1015/8826/0933/Y5plan_Space_craters_2020.docx) |  |  |  |  | Growth of Babies |
| reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations | Night and Day International |  |  |  | Lifecycles  TAPS: [Living things: life cycle research](https://pstt.org.uk/application/files/7415/8826/0717/Y5plan_Life_cycles_2020.docx) | Life Expectancy |
| identifying scientific evidence that has been used to support or refute ideas or arguments | Spherical Bodies | TAPS: [Forces: aquadynamics](https://pstt.org.uk/application/files/3315/8826/1364/Y5plan_Aquadynamics_2020.docx) or [marble run](https://pstt.org.uk/application/files/5615/1957/4829/Y5plan_SciDT_-_Marble_run.docx) or [Bridge engineers](https://pstt.org.uk/application/files/5715/1957/4824/Y6plan_SciDT_-_Bridge_engineers.docx) | Reversible or irreversible? |  |  |  |

| **Working Scientifically Y6** | Aut 1 | Aut 2 | Spr 1 | Spr 2 | Sum1 | Sum2 |
| --- | --- | --- | --- | --- | --- | --- |
| planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary | Yeast fair test experiment | Battle of the Beaks | TAPS: [Light questions](https://pstt.org.uk/application/files/5815/7684/2167/Y6plan_Light_questions.docx) |  |  | TAPS:[Electricity: bulb brightness](https://pstt.org.uk/application/files/5815/7684/2167/Y6plan_Light_questions.docx) temporary |
| using test results to make predictions to set up further comparative and fair tests |  |  | Reflectiveness investigation | TAPS: [Animals inc Humans: heart rate](https://pstt.org.uk/application/files/3815/8826/0988/Y6plan_Heartrate_pose_2020.docx) |  |  |
| taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate |  |  |  |  |  | TAPS:  [Elect: conductive dough](https://pstt.org.uk/application/files/9715/1957/4882/Y6plan_Elect_-_Conductive_dough.docx) |
| recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs | TAPS: [Living things: outdoor keys](https://pstt.org.uk/application/files/3115/8826/1180/Y6plan_Outdoor_keys_2020.docx) |  | Light investigations |  |  |  |
| reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations | Invertebrate s  TAPS [Living things: invertebrate research](https://pstt.org.uk/application/files/5415/8826/1126/Y6plan_Invertebrate_research_2020.docx) |  | Light colour mixing |  |  |  |
| identifying scientific evidence that has been used to support or refute ideas or arguments |  | TAPS: [Evolution: fossil habitats](https://pstt.org.uk/application/files/2815/8826/1064/Y6plan_Fossil_habitats_2020.docx) |  |  |  |  |