



## Abbey Primary School - Whole School Progression Grid



### Plants

Misconceptions - Children may think that:

- trees, grass, vegetables and weeds are not plants.
- a trunk is not a stem.
- plants get their nutrients from 'plant food'.
- plants breath like humans do.
- plants take in all substances they need through their roots.
- leaves take in water.
- sunlight is helpful, but not critical.
- sunlight keeps plants warm which helps them to grow.
- plants need things provided by people.

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| EYFS | In the EYFS, children:<br><br>Learn how to care for the environment<br>Begin to know that plants and trees need light and water to grow<br>Begin to identify the plants and trees around the school grounds (daisy, dandelion, lavender, holly, willow - all in school grounds)<br>Treat plants with care (not picking them, treading on them etc.)<br>Begin to name the parts of a plant, including stem, leaf and flower<br>Understand that we can grow fruit and vegetables using our school garden<br>Begin to identify how they grow (under the ground, in the soil (protruding), on a tree) | Vocabulary                                                                     |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Plant<br>Tree<br>Leaves<br>Garden<br>Seed<br>Stem<br>Flower<br>Trunk<br>Branch |
|      | NC Statements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Key Knowledge                                                                  |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Vocabulary                                                                     |

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| Year 1 | <ul style="list-style-type: none"> <li>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> <li>Identify and describe the basic structure of a variety of common flowering plants, including trees.</li> </ul> | <p>To know what a plant is</p> <p>To know and describe the structure of a plant, including bulb, roots, stem, leaf and flower</p> <p>To know that some plant species grow and survive in natural surroundings without being maintained by humans and to identify these</p> <p>(Wild plant examples - Daisy, Dandelion, Ivy)</p> <p>To know that some plant species must be planted and looked after by people and to identify these</p> <p>(Garden plant examples - Tulip, Lily, Lavender, Sunflower, Allium)</p> <p>To know the structure of a tree, including roots, trunk, branches, twigs and leaves</p> <p>To know that an evergreen tree is a species of tree which keeps green leaves all year round</p> <p>To know that a deciduous tree is a species of tree which sheds its leaves throughout Autumn (Geography Link KS2)</p> <p>To know and identify different, commonly occurring deciduous and evergreen trees by the shape of their leaves</p> <p>(Tree examples - Oak, Silver Birch, Sycamore, Horse Chestnut)</p> | Plant<br>Tree<br>Species<br>Evergreen<br>Deciduous<br>Leaves<br>Seasons<br>Wild<br>Garden<br>Bulb<br>Seed<br>Roots<br>Stem<br>Flower<br>Trunk<br>Branch |
| Year 2 | <ul style="list-style-type: none"> <li>Observe and describe how seeds and bulbs grow into mature plants</li> <li>Find out and describe how plants need <b>water, light and a suitable temperature</b> to grow and stay healthy.</li> </ul>                           | <p>To know that a plant can grow from either a seed or a bulb and describe how this happens</p> <p>To observe a plant growing over time from a bulb, exploring the different stages of growth</p> <p>(Tulip)</p> <p>To observe a plant growing over time from a seed, exploring the different stages of growth</p> <p>(Sunflower)</p> <p>To know that plants need water to sprout and that it transports nutrients throughout the plant</p> <p>To know that water transports from the roots, up the stem and to the leaves</p> <p>To know that plants need light in order to create their own energy</p> <p>To know that plants need a suitable temperature to help maintain their growth at an appropriate level</p>                                                                                                                                                                                                                                                                                                             | Sprout<br>Seedling<br>Shoot<br>Absorbed<br>Transportation<br>Nutrients                                                                                  |

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| Year 3 | <ul style="list-style-type: none"> <li>• Identify and describe the functions of different parts of flowering plants: <b>roots, stem/trunk, leaves and flowers</b></li> <li>• Explore the requirements of plants for life and growth (<b>air, light, water, nutrients from soil, and room to grow</b>) and how they vary from plant to plant</li> <li>• Investigate the way in which water is transported within plants</li> <li>• Explore the part that flowers play in the life cycle of flowering plants, including <b>pollination, seed formation and seed dispersal</b>.</li> </ul> | <p>To know that roots take up water and nutrients from the soil and anchor the plant to the ground to keep it steady</p> <p>To know that the stem carries water and nutrients to different parts of the plant. It also provides support and keeps the plant upright.</p> <p>To know that leaves help plants to obtain sunlight, which they can then turn into energy through a process called photosynthesis.</p> <p>To know that the main purpose of a flower is for reproduction.</p> <p>To label the main parts of a flower (stigma, style, anther, filament, sepal, ovary)</p> <p>(Lily dissection)</p> <p>To know that a plant needs air, light, water, nutrients and room to grow to survive.</p> <p>To know that water transports from the roots, up the stem and to the leaves</p> <p>To know that pollination is the transfer of pollen from flower to flower and can occur as a result of seed dispersal, helped by animals, water or wind</p> <p>(Animals - Lavender (bees), Raspberry (hook onto animals), Water - Silver Birch, Wind - Dandelions)</p> <p>To know that seed formation is the result of pollination.</p> <p>To know that seed dispersal is the movement, spread or transport of seeds away from the parent plant</p> <p>(Allium - Seed dispersal example)</p> | <p>Reproduction</p> <p>Energy</p> <p>Photosynthesis</p> <p>Pollination</p> <p>Seed formation</p> <p>Seed dispersal</p> |
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## Living Things and their Habitats

Misconception - Children may think that:

- plants and seeds are not living.
- arrows in food chains means 'eats'.
- animal features are not related to the habitat in which they live.
- the only habitats that exist are the ones local to the children.
- there are only a few kind of living things in each habitat.
- a habitat is not related to the needs of the animal.

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| EYFS   | In the EYFS, children:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Vocabulary                                                                                                                                                                       |
|        | Begin to understand the impact of humans on the environment/ world<br>Begin to understand that different animals live in different countries because they are suited to the climate<br>Know that plants and animals live and die<br>Match some plants and animals to their correct habitat                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Dead<br>Living<br>Habitat<br>Animal<br>Human                                                                                                                                     |
|        | NC Statements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Key Knowledge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Vocabulary                                                                                                                                                                       |
| Year 2 | <ul style="list-style-type: none"> <li>• explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li>• 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</li> <li>• identify and name a variety of plants and animals in their habitats, including microhabitats</li> <li>• describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</li> </ul> | To know that things which are dead were once alive.<br>To know if something is living, dead or has never been alive and explain how they know<br>To know the characteristics of living things are movement, respiration, sensitivity, nutrition, excretion, reproduction and growth through discussion and first-hand exploration of living things ( <b>human, guinea pig and plants</b> )<br>To know that a habitat is an ecosystem which plants and animals live.<br>To know different types of habitats and name some of the plants and animals that live there ( <b>desert, polar region, grassland, pond, rainforest</b> )<br>To know that habitats provide food, water and shelter<br>To know that a very small part of a habitat is called a microhabitat ( <b>space under a stone</b> )<br>To know that energy in food chains originates from the Sun<br>To know that a producer is a plant which produces its own energy from the Sun and is always second in the food chain<br>To know that a consumer is an animal which eats another animal or plant for its energy<br>To know the terms prey and predator | Dead<br>Living<br>Never lived<br>Habitat<br>Environment<br>Polar<br>Desert<br>Grassland<br>Rainforest<br>Food chain<br>Energy<br>Sun<br>Producer<br>Consumer<br>Prey<br>Predator |

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| Year 4 | <ul style="list-style-type: none"> <li>• recognise that living things can be grouped in a variety of ways</li> <li>• explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>• recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul> | <p>To know that living things can be broadly grouped due to their characteristics (plants - deciduous, evergreen, flowering, non-flowering) (animals - mammals, reptiles, birds, amphibians, fish) in readiness for subgrouping in Y6</p> <p>To know that some animals have a backbone (vertebrates) and some animals do not have a backbone (invertebrates)</p> <p>To know that humans can have an impact on the environment (building on greenfield sites (local) and deforestation) (Geography Link)</p> <p>To know the effects that changes to environments has on the living things which live there (Geography Link)</p>                                                                                                                                                              | <p>Habitat</p> <p>Classification</p> <p>Environment</p> <p>Danger</p> <p>Threat</p> <p>Vertebrate</p> <p>Invertebrate</p>                          |
| Year 5 | <ul style="list-style-type: none"> <li>• describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>• describe the life process of reproduction in some plants and animals.</li> </ul>                                                                                                                                                  | <p>To know that a lifecycle is the different stages a plant or animal goes through during its life, starting with reproduction</p> <p>To know the stages of the life cycle of a mammal are birth, juvenile and adult. The gestation period is the time it takes for the baby mammal to develop in the uterus.</p> <p>(Humans have a 9 month gestation period and elephants have the longest gestation period at up to 22 months)</p> <p>To know that the life cycle of mammals, amphibians, insects and birds all differ.</p> <p>To know the life process of some plants and animals, including reproduction (human, elephant, sunflower).</p> <p>To know the effects of puberty on males and females (menstruation, hair growth, body odour, voice deepens) - Use alongside RSE scheme</p> | <p>Life Cycle</p> <p>Stages</p> <p>Reproduction</p> <p>Gestation period</p> <p>Uterus</p> <p>Mammal</p> <p>Amphibian</p> <p>Insect</p> <p>Bird</p> |
| Year 6 | <ul style="list-style-type: none"> <li>• describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals</li> <li>• give reasons for classifying plants and animals based on specific characteristics.</li> </ul>                              | <p>To know that micro-organisms are bacteria, virus or fungus and cannot be seen by the naked eye.</p> <p>To know that broad groupings of living things (microorganisms, plants and animals) can be subdivided according to common observable characteristics and based on similarities and differences (Branching Data Base Computing Link).</p> <p>To know that some micro-organisms are useful to us (yeast).</p>                                                                                                                                                                                                                                                                                                                                                                        | <p>Micro-organism</p> <p>Bacteria</p> <p>Fungus</p> <p>Virus</p> <p>Classification</p> <p>Characteristics</p>                                      |

## Animals, Including Humans

Misconceptions - Children may think that:

- humans are not animals.
- all animals are born looking like their parents.
- humans don't change, we just get bigger.
- certain whole food groups are 'bad' for you.

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| EYFS | In the EYFS, children:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               | Vocabulary                                                                                                      |
|      | <p>Explore using their five senses</p> <p>Identify basic body parts on people and animals (head, hand, foot, leg, arm)</p> <p>Show a kind and considerate attitude towards all animals, including school pets</p> <p>Match adult and baby animals (sheep, lamb, cow, calf, pig, piglet, chicken, chick, dog, puppy, cat, kitten)</p> <p>Begin to identify and name a range of pet, farm, wild and sea animals</p> <p>Identify a range of minibeasts and know where to find them (worm, woodlouse, ladybird, bee, fly, spider, butterfly, caterpillar)</p> <p>Begin to understand life cycles (butterfly, chicken and frog)</p> |               | <p>Eye</p> <p>Mouth</p> <p>Tongue</p> <p>Hand</p> <p>Ear</p> <p>Nose</p> <p>Adult</p> <p>Baby</p> <p>Animal</p> |
|      | NC Statements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Key Knowledge | Vocabulary                                                                                                      |

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| Year 1 | <ul style="list-style-type: none"> <li>• Identify and name a variety of common animals including fish, amphibians, reptiles, birds, insects and mammals</li> <li>• Identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>• Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds, insects and mammals, including pets)</li> <li>• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</li> </ul> | <p>To know that animals can be categorised based on their characteristics</p> <p>To know that mammals have hair/fur, are warm blooded and most are born alive<br/>(Humans, dogs, polar bear, lions, dolphins, elephant)</p> <p>To know that birds have feathers, two legs, are warm blooded and lay eggs<br/>(Barn owl, robin, blackbird)</p> <p>To know that reptiles have dry, scaly skin, are cold blooded and most lay eggs (although some give birth to live young)<br/>(Snake, crocodiles, lizards, turtles)</p> <p>To know that amphibians have moist skin, are cold blooded, live on land as well as in water and lay eggs in water<br/>(Frogs, newts, salamanders)</p> <p>To know that fish have gills and fins, are cold blooded and only live in water</p> <p>To know that insects have bodies with three segments that are protected by a hard shell. They have three pairs of legs and lay eggs.</p> <p>To know that a carnivore is an animal which feeds on other animals</p> <p>To know how some animals are specifically suited to their environment (dolphin, elephant and polar bear)</p> <p>To know that a herbivore feeds on plants</p> <p>To know that an omnivore eats both plants and animals</p> <p>To know the basic parts of the human body, including the head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth, nose, tongue, hands, fingers, feet and toes</p> <p>To know which body part associates with which sense (sight, sound, touch, taste, smell) and why they are important in everyday life</p> | <p>Carnivore</p> <p>Herbivore</p> <p>Omnivore</p> <p>Mammal</p> <p>Reptile</p> <p>Bird</p> <p>Sight</p> <p>Sound</p> <p>Touch</p> <p>Taste</p> <p>Smell</p> |
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| Year 2 | <ul style="list-style-type: none"> <li>• Notice that animals, including humans, have offspring which grow into adults</li> <li>• Find out about and describe the basic needs of animals, including humans, for survival (<b>water, food and air</b>)</li> <li>• Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> </ul> | <p>To know and describe the lifecycle of some living things e.g. (Chicken- egg-chick-chicken), (Butterfly - egg - caterpillar - pupa - Butterfly), (Frog - spawn, tadpole, frog), (Human - Baby, toddler, child, teenager, adult)</p> <p>To know and recognise a range of animals and their offspring (humans and babies, whale and calf, pig and piglet, horse and foal, elephant and calf, dog and puppy, rabbit and kit/ kitten)</p> <p>To know why animals, including humans have offspring.</p> <p>To know that animals including humans have basic needs for survival (water, food and air)</p> <p>To know the different food types (carbohydrates, protein, dairy, fats, fruit and vegetables)</p> <p>To know that to be healthy, humans must have a balance of the food types (DT Link)</p> <p>To know the benefits of exercise on the human body (PE Link)</p>                                                     | <p>Offspring</p> <p>Carbohydrates</p> <p>Protein</p> <p>Fats</p> <p>Dairy</p> <p>Fruit and vegetables</p> <p>Basic needs</p> |
| Year 3 | <ul style="list-style-type: none"> <li>• 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</li> <li>• Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> </ul>                                           | <p>To understand a basic food chain, knowing that animals and humans get nutrition from what they eat (Y2 Re-Visit)</p> <p>To explain the importance of a nutritious, balanced diet and what this should include.</p> <p>To know that nutrients, water and oxygen are transported through the blood (beginnings of circulatory system taught in Year 6) in animals and humans.</p> <p>To know that all humans have skeletons and to describe the purpose of <b>bones</b>:</p> <p>To provide support and shape of the body and protect delicate, internal organs.</p> <p>The skull protects the brain.</p> <p>The femur helps humans to stand and move.</p> <p>The pelvis helps to support the spine.</p> <p>The spine helps humans to twist and be held upright.</p> <p>The ribcage protects the heart and lungs.</p> <p>and <b>muscles</b>:</p> <p>To provide the pull on bones needed to create movement of the body.</p> | <p>Skeleton</p> <p>Bones</p> <p>Muscles</p> <p>Strength</p> <p>Nutrition</p>                                                 |

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| Year 4 | <ul style="list-style-type: none"> <li>Describe the simple functions of the basic parts of the digestive system in humans</li> <li>Identify the different types of teeth in humans and their simple functions</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul> | <p>To know that the digestive system is made up of the mouth, oesophagus, stomach, small intestine and large intestine</p> <p>To know that:</p> <ul style="list-style-type: none"> <li>the <b>mouth</b> is where food enters the body and is broken down by teeth</li> <li>the <b>tongue</b> rolls the food into a ball to be swallowed</li> <li>food is swallowed down the <b>oesophagus</b> (a soft, muscular tube) and passes to the stomach</li> <li>the <b>stomach</b> is where food is digested, and it contains acid to kill harmful microorganisms which might be in our food</li> <li>the <b>small intestine</b> continues to digest food and absorbs many of the nutrients from the food</li> <li>the <b>large intestine</b> is where water and salts are absorbed and faeces form</li> </ul> <p>To know that humans have different types of teeth such as incisor, premolar, canine and molar</p> <p>To know the function of each</p> <ul style="list-style-type: none"> <li>Incisor teeth have sharp edges that help to bite into food</li> <li>Premolar teeth are to crush and tear food. They are between the canine and molar teeth.</li> <li>Canine teeth are pointed and sharp to help tear food</li> <li>Molar teeth are large and roughly edged at the back of the mouth. They are the strongest and biggest human teeth</li> </ul> <p>To know that a simple food chain represents the transfer of energy between plants and animals in an eco-system</p> <p>To know the terms producer, predators and prey and identify these in a variety of food chains</p> | <p>Mouth</p> <p>Tongue</p> <p>Oesophagus</p> <p>Stomach</p> <p>Small intestine</p> <p>Large intestine</p> <p>Nutrients</p> <p>Digest</p> <p>Producers</p> <p>Predators</p> <p>Prey</p> <p>Energy</p> |
| Year 5 | <ul style="list-style-type: none"> <li>Describe the changes as humans develop to old age.</li> </ul>                                                                                                                                                                                                                           | <p>To know the six stages of a human life cycle (foetus, baby, childhood, adolescence, adulthood and old age) (<a href="#">PSHE/ RSE Link</a>)</p> <p>To know the typical physical changes of ageing (grey hair, receding hairline, wrinkles) (<a href="#">PSHE/ RSE Link</a>)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>Life cycle</p> <p>Foetus</p> <p>Childhood</p> <p>Adolescence</p> <p>Adulthood</p> <p>Ageing</p>                                                                                                   |

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| Year 6 | <ul style="list-style-type: none"> <li>• Identify and name the main parts of the human circulatory system, and describe the functions of the <b>heart, blood vessels and blood</b></li> <li>• Recognise the impact of <b>diet, exercise, drugs and lifestyle</b> on the way their bodies function</li> <li>• Describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul> | <p>To know that the circulatory system is responsible for the flow of blood, nutrients and oxygen</p> <p>To know and locate the major organs in the human body (including digestive system (Year 4) and circulatory systems: oesophagus, stomach, large intestine, small intestine, heart, lungs, brain)</p> <p>To know that the circulatory system consists of three independent parts which work together (the heart, lungs and blood vessels)</p> <p>To know that the heart pumps blood around the body</p> <p>To know the difference between a vein, an artery and a capillary</p> <p>To know the difference between oxygenated blood and deoxygenated blood and how this travels through the circulatory system</p> <p>To know the effects of lifestyle choices (including diet, exercise, drugs and lifestyle) on the circulatory system and the way the body functions as a result (<a href="#">PE and PSHE/ RSE Link</a>)</p> | <p>Heart</p> <p>Lungs</p> <p>Arteries, veins and vessels</p> <p>Nutrients</p> <p>Oxygen</p> |
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## Evolution and Inheritance

Misconceptions - Children may think that:

- environmental change can be inherited (eg if a sheep loses its tail, its lambs will be born without a tail).
- humans used to be monkeys.
- an individual can evolve during its own lifespan.
- evolution produces living things perfectly adapted to their environment.
- natural selection is an active process (eg an individual can **try** to adapt).
- natural selection is always good.

|        | NC Statements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Key Knowledge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Vocabulary                                                                                                  |
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| Year 6 | <ul style="list-style-type: none"> <li>• recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li>• recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>• identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</li> </ul> | <p>To know that living things change over time and that these are called adaptations.</p> <p>To know what evolution is and give examples of how they know it happens e.g. Birds' beaks and the Blue-Footed Booby</p> <p>To know that natural selection is the process by which a species changes over time in order to survive.</p> <p>To know that a fossil is the preserved remains or traces of a dead organism.</p> <p>To know that fossils can provide evidence for how species were in the past and how they have changed over time (<b>History Link</b>)</p> <p>To know why living things produce offspring of the same kind</p> <p>To know that living things produce offspring, but they vary and are not identical to their parents</p> <p>To know that birds have specialised beaks dependent on their food source</p> <p>To know that birds have specialised feet as they have adapted to their surroundings</p> <p>To know that new species are formed when adaptations are made, leading to evolution (eg birds on Galapagos Islands)</p> <p>To know key facts about Charles Darwin's scientific findings</p> | <p>Adaptations</p> <p>Evolution</p> <p>Fossils</p> <p>Genes</p> <p>Inheritance</p> <p>Natural Selection</p> |

| Everyday Materials (Including Rocks and States of Matter)                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                          |
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| <p>Misconceptions - Children may think that:</p> <ul style="list-style-type: none"> <li>- objects and materials are the same.</li> <li>- when a substance has dissolved, it has 'disappeared'.</li> <li>- substances, like sugar, 'melt' in water.</li> <li>- liquids that evaporate disappear forever.</li> <li>- steam and condensation are the same.</li> <li>- evaporation only occurs when water is boiling.</li> <li>- clouds are made of gas.</li> <li>- boiling/evaporation are irreversible changes.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                          |
| EYFS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | In the EYFS, children:                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Vocabulary                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>Begin to name a range of materials (stone, wood, glass, paper, plastic, metal, fabric)</p> <p>Explore which material is best for a specific purpose</p> <p>Begin to identify natural and man-made materials</p> <p>Explore and observe that materials can change state (eg when baking and freezing)</p>                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>Material</p> <p>Freeze</p> <p>Melt</p>                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | NC Statements                                                                                                                                                                                                                                                                                                                                                                                                                                               | Key Knowledge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Vocabulary                                                                               |
| Year 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• distinguish between an object and the material from which it is made</li> <li>• identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>• describe the simple physical properties of a variety of everyday materials</li> <li>• compare and group together a variety of everyday materials on the basis of their simple physical properties.</li> </ul> | <p>To know and recognise objects made from wood, plastic, glass, metal, water and rock</p> <p>To describe the properties of the above materials using terminology such as hard, soft, flexible, rigid, transparent (see-through), opaque (light does not shine through), rough, smooth, shiny or dull</p> <p>To know why certain materials are useful for a specific job (wood, plastic, glass, metal, water and rock)</p> <p>Compare and group materials based on the above properties</p> <p>(Toys History Link)</p> | <p>Material</p> <p>Properties</p> <p>Flexible</p> <p>Rigid</p>                           |
| Year 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li>• find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> </ul>                                                                                        | <p>To know the properties of everyday materials</p> <p>To know what materials objects are made from e.g. window - glass, chair - plastic, door - wood, outside wall - brick, cutlery - metal</p> <p>To know the properties of materials that make them suitable or unsuitable for particular purposes (DT Link)</p> <p>To know the impact of squashing, bending, twisting and stretching wood, metal, plastic, glass, brick, rock, paper and cardboard</p>                                                             | <p>Properties</p> <p>Materials</p> <p>Squash</p> <p>Twist</p> <p>Bend</p> <p>Stretch</p> |

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| Year 3 | <ul style="list-style-type: none"> <li>• compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>• describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>• recognise that soils are made from rocks and organic matter.</li> </ul> | <p>To know a variety of rock types, such as sedimentary (chalk and sandstone), metamorphic (slate and marble) and igneous (granite)</p> <p>To know how each different rock type (igneous, sedimentary and metamorphic) are formed</p> <p>To know that rocks have different properties</p> <p>To know that some rocks, such as chalk and sandstone, are permeable which means they let water through</p> <p>To know that some rocks, such as slate, are impermeable which means they do not let water through</p> <p>To use their knowledge of properties of rock to explain why they are used for certain things (slate - roof tiles, chalk - writing, marble - tiles/ worktops and statues)</p> <p>(<a href="#">Stone Age History Link</a>)</p> <p>To know that fossils are formed in sedimentary rock after an animal or plant has died and its parts have decayed, leaving a mould in its surrounding material. This process is called fossilisation (<a href="#">History Link</a>).</p> <p>To know that it is very rare for a fossil to be formed. Usually after most animals die, their bodies just rot away and nothing is left behind. However, under certain special conditions, a fossil can form.</p> <p>To know that fossils provide evidence for how things have changed over time (<a href="#">History Link</a>).</p> <p>To know that soil is a mixture of tiny particles of rock, organic matter (dead plants and animals), air and water</p> | <p>Sedimentary</p> <p>Metamorphic</p> <p>Igneous</p> <p>Permeable</p> <p>Impermeable</p> <p>Fossilisation</p> |
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| Year 4 | <ul style="list-style-type: none"> <li>• compare and group materials together, according to whether they are solids, liquids or gases</li> <li>• 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)</li> <li>• identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul> | <p>To know that there are three states of matter - solid, liquid and gas - and their properties</p> <p>To know that the shape of a solid does not change on its own, can be held and even though they can be poured, sugar, salt and flour are all solids. Each grain of salt, for example, keeps the same shape and volume</p> <p>(Solid examples - sugar, sand and flour as well as more obvious solid objects)</p> <p>To know that a liquid can flow or be poured easily, and they change their shape depending on the container they are in. Even when liquids change their shape, their volume stays the same.</p> <p>(Liquid examples - water, honey, juice, toothpaste)</p> <p>Slime (eg children's play) is called a non-Newtonian fluid. It is in between a solid and a liquid.</p> <p>To know that gases are often invisible. They do not have a fixed shape, they spread out and change their shape and volume to fill up whatever container they are in.</p> <p>(Gas examples - air, helium and water vapour)</p> <p>To know that water, as a liquid, boils at 100°C (boiling point)</p> <p>To know that water, as a liquid, freezes at 0°C (freezing point)</p> <p>To link the above knowledge with condensation and evaporation in the water cycle (Geography link)</p> | <p>States of matter</p> <p>Solid</p> <p>Liquid</p> <p>Gas</p> <p>Volume</p> <p>Shape</p> <p>Boiling</p> <p>Freezing</p> <p>Degrees Celsius (°C)</p> <p>Condensation</p> <p>Evaporation</p> <p>Water cycle</p> |
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| Year 5 | <ul style="list-style-type: none"> <li>• 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</li> <li>• know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>• use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>• give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>• demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>• 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.</li> </ul> | <p>To know that solubility is a material's ability to dissolve in water</p> <p>To know that transparency is a material's ability to let light through</p> <p>To know that electrical conductivity is a material's ability to let electrical currents flow through it</p> <p>To know that thermal conductivity is a material's ability to let heat flow through it</p> <p>To know that a material can either attract or repel a magnet</p> <p>To know that a solution is a when a soluble material (solute) dissolves into a liquid (solvent) (sugar in water) and that this is a reversible change</p> <p>To know the soluble material can be recovered by condensation or distillation</p> <p>To know that a mixture is a combination of substances which are not chemically joined (dirt and water) and that this is a reversible change</p> <p>To know that mixtures can be separated by filtering, sieving or evaporating</p> <p>To know that some changes are reversible and that some result in the formation of new materials</p> <p>(burning paper, acid on bicarbonate of soda)</p> | <p>Materials</p> <p>Properties</p> <p>Solubility</p> <p>Transparency</p> <p>Conductivity</p> <p>Electrical</p> <p>Thermal</p> <p>Magnets</p> <p>Attract</p> <p>Repel</p> <p>Condensation</p> <p>Distillation</p> <p>Mixture</p> <p>Solution</p> <p>Reversible</p> <p>Filtering</p> <p>Sieving</p> <p>Evaporating</p> |
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## Earth and Space (Including Seasonal Change)

Misconceptions - Children may think that:

- the Earth is the centre of the Solar System.
- the Sun is not a star.
- planets cannot be seen without a telescope.
- stars and constellations appear in the same place in the sky every night.
- the moon 'comes out' at night.
- the moon is a light source rather than reflecting the sun's light.

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| EYFS   | In the EYFS, children:                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                 | Vocabulary                                                                                                 |
|        | <p>Learn about different types of weather and keep a class record of these</p> <p>Explore the four seasons and know some features of these (eg clothes, weather or events)</p> <p>Begin to understand that the seasons are a cycle that repeats</p> <p>Begin to understand that the weather is different all over the world</p> <p>Name the earth, moon, sun and stars</p> <p>Begin to know about other planets in the solar system</p> <p>Discuss the differences between day and night</p> |                                                                                                                                                                                                                                                                                                 | <p>Weather</p> <p>Summer</p> <p>Autumn</p> <p>Winter</p> <p>Spring</p> <p>Earth</p> <p>Moon</p> <p>Sun</p> |
|        | NC Statements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Key Knowledge                                                                                                                                                                                                                                                                                   | Vocabulary                                                                                                 |
| Year 1 | <ul style="list-style-type: none"> <li>• observe changes across the four seasons</li> <li>• observe and describe weather associated with the seasons and how day length varies.</li> </ul>                                                                                                                                                                                                                                                                                                   | <p>To know the four seasons</p> <p>Winter, Spring, Summer, Autumn</p> <p>To recognise the four seasons (pictorially) and describe the changes</p> <p>To know that the day length is shorter in Winter and longer in Summer. Days in Spring and Autumn receive a similar amount of sunlight.</p> | <p>Seasons</p> <p>Winter</p> <p>Spring</p> <p>Summer</p> <p>Autumn</p> <p>Daylight</p> <p>Length</p>       |

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| Year 5 | <ul style="list-style-type: none"> <li>• describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li> <li>• describe the movement of the Moon relative to the Earth</li> <li>• describe the Sun, Earth and Moon as approximately spherical bodies</li> <li>• use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</li> </ul> | <p>To know that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune</p> <p>To know that a moon is a celestial body that orbits a planet and that the Earth has one moon</p> <p>To know that the Earth, and other planets, orbit the Sun and that it takes 365 days for the Earth to complete one full orbit of the sun.</p> <p>To know that whilst the Earth orbits the Sun, it rotates. It takes 24 hours to complete one full rotation. When the UK is facing the sun, it is day, and when it is facing away, it is night.</p> <p>To know that the moon orbits the Earth.</p> <p>To know that the moon is not a light source. It reflects the light from the Sun.</p> <p>To know that the Earth blocks the light from the Sun, which is why we see different phases of the moon.</p> | <p>Sun</p> <p>Moon</p> <p>Solar system</p> <p>Planet</p> <p>Orbit</p> <p>Celestial</p> <p>Spherical bodies</p> <p>Rotation</p> <p>Axis</p> |
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## Energy (Including Light, Sound and Electricity)

Misconceptions - Children may think that:

- reflective surfaces emit light.
- only shiny surfaces will reflect light.
- opaque objects do not reflect light.
  
- sound only travels through air, not solids or liquids.
- sound is slowed down by physical obstructions.
- sound gets quieter as it travels further because it has 'faded out' or run out of 'energy'.
- volume and pitch are the same thing or mix them up.
  
- different coloured wires affect how the circuit works.
- wire is made of plastic and so plastic conducts electricity.
- if a circuit is broken, energy goes into the air.
- electricity comes out of both sides of the battery and leads to both sides of the component.
- current, voltage and electricity are the same thing.
- current decreases as it passes through components.
- electricity is visible.

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| EYFS | In the EYFS, children:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |               | Vocabulary                                                                                                                                                                              |
|      | <p>Explore light and dark</p> <p>Experiment with light sources to observe the effects (eg torches, glow sticks, projectors and light boxes)</p> <p>Begin to notice shadows</p> <p>Are taught about the dangers of sunlight (eg damage to eyes and skin)</p><br><p>Know that sounds are heard through our ears by listening</p> <p>Explore making, and listening to, a range of sounds using voices, instruments, body parts and objects</p> <p>Begin to differentiate between loud and quiet sounds</p><br><p>Name a range of technology that uses electricity through mains (laptop, iPad, cooker, microwave, television, lights, fridge)</p> <p>Name a range of technology that uses batteries (remote control toys and BeeBots)</p> <p>Explore with a range of components (batteries, bulbs and wires) to make a simple electrical circuit</p> |               | <p>Light</p> <p>Dark</p> <p>Shadow</p> <p>Torch</p><br><p>Loud</p> <p>Quiet</p> <p>Voice</p> <p>Instrument</p><br><p>Electricity</p> <p>Plug</p> <p>Battery</p> <p>Bulb</p> <p>Wire</p> |
|      | NC Statements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Key Knowledge | Vocabulary                                                                                                                                                                              |

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| Year 3 | <ul style="list-style-type: none"> <li>• recognise that they need light in order to see things and that dark is the absence of light</li> <li>• notice that light is reflected from surfaces</li> <li>• recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>• recognise that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>• find patterns in the way that the size of shadows change.</li> </ul> | <p>To know that a light source is an object that produces light.<br/>         To know that darkness is the absence of light.<br/>         To know that we need light in order to see things.<br/>         To know that light travels in a straight line.<br/>         Light is a beam of energy that travels in a wave from a source called light rays.<br/>         To know that when light hits an object, it is reflected (bounces off).<br/>         To know that if the reflected light hits our eyes, we can see the object.<br/>         To know that light from the Sun can be dangerous and that we should not look at it directly.<br/>         To know that shadows are formed when light from a light source is blocked by an opaque object. To know that the closer the object is to the light source, the bigger the shadow as more light is blocked and vice versa.<br/>         Materials that block light are completely opaque, those that let some light through are translucent and those that let all the light through are called transparent.</p> | <p>Light source<br/>         Shadow<br/>         Reflected<br/>         Opaque<br/>         Translucent<br/>         Transparent<br/>         Light rays</p> |
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| Year 4 | <ul style="list-style-type: none"> <li>• identify how sounds are made, associating some of them with something vibrating</li> <li>• recognise that vibrations from sounds travel through a medium to the ear</li> <li>• find patterns between the pitch of a sound and features of the object that produced it</li> <li>• find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>• recognise that sounds get fainter as the distance from the sound source increases.</li> </ul>                                                                                                                                                        | <p>To know that sounds travel as vibrations to our ear through a medium</p> <p>To know that the faster the sound wave oscillates, the higher pitch it will have (<i>guitar</i>)</p> <p>To know that when we increase the volume of a sound, the amplitude of the wave is increased (<i>drum</i>)</p> <p>To know what makes high and low sounds</p> <p>To know that sounds get fainter the further you get from the sound source</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <p>Vibrations</p> <p>Sound wave</p> <p>Wavelength</p> <p>Pitch</p> <p>Volume</p> <p>Oscillates</p> <p>Amplitude</p> <p>Fainter</p> <p>Source</p>                                                                   |
|        | <ul style="list-style-type: none"> <li>• identify common appliances that run on electricity</li> <li>• construct a simple series electrical circuit, identifying and naming its basic parts, including <b>cells, wires, bulbs, switches and buzzers</b></li> <li>• 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</li> <li>• recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>• recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul> | <p>To know that electricity is energy which flows from one place to another</p> <p>To know a range of common appliances which run on electricity (<i>television, fridge, kettle, lights</i>)</p> <p>To know how to stay safe when using electricity (checking wires are covered, ensuring electricity is not near water and not having too many appliances in one socket)</p> <p>To know that some appliances run on batteries as opposed to mains electricity</p> <p>To construct a simple series circuit including cells, wires, bulbs, switches and buzzers</p> <p>To know that a successful circuit must be a complete loop</p> <p>To know that a switch open and closes a circuit</p> <p>To know that a conductor is a material that allows electricity to flow through it (<i>silver, gold, copper, steel, sea water</i>)</p> <p>To know that an insulator is a material which blocks electricity from flowing through it (<i>rubber, glass, wood, paper</i>)</p> | <p>Electricity</p> <p>Current</p> <p>Flow</p> <p>Appliances</p> <p>Battery</p> <p>Mains</p> <p>Series circuit</p> <p>Loop</p> <p>Switch</p> <p>Motor</p> <p>Cell</p> <p>Bulb</p> <p>Conductor</p> <p>Insulator</p> |

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| Year 6 | <ul style="list-style-type: none"> <li>• recognise that light appears to travel in straight lines</li> <li>• 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</li> <li>• explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</li> <li>• use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul><br><ul style="list-style-type: none"> <li>• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> <li>• 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</li> <li>• use recognised symbols when representing a simple circuit in a diagram.</li> </ul> | <p>To know that a light source is an object that produces light.</p> <p>To know that light appears to travel in straight lines.</p> <p>To know that we see light sources because light travels from them into our eyes.</p> <p>We see can see non-light sources because light from a light source reflects off them and travels into our eyes (Y3 Re-Cap).<br/> (WW2 Link - Which materials could be used in a blackout?)</p><br><p>To know that voltage is the name of the force causing electrons to flow and how the electrical current is measured. The bigger the voltage, the bigger the current.</p> <p>To investigate the effect of using different numbers and voltage of cells within a circuit on bulbs and buzzers.</p> <p>To use the following symbols in a simple circuit diagram</p> <div> <p>lamp (indicator)    lamp (lighting)    wire    ammeter</p> <p>motor    voltmeter    buzzer    open switch</p> <p>cell    battery    closed switch</p> </div> <p>(WW2 Link - Morse code)</p> | <p>Light source</p> <p>Straight lines</p> <p>Travel</p> <p>Reflect</p><br><p>Circuit</p> <p>Voltage</p> <p>Symbols</p> <p>Circuit diagram</p> <p>Ammeter</p> <p>Motor</p> <p>Voltmeter</p> <p>Buzzer</p> <p>Bulb</p> <p>Switch</p> <p>Battery</p> <p>Cell</p> <p>Output</p> <p>Input</p> |
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## Forces and Magnets

Misconceptions - Children may think that:

- all metals are attracted to a magnet.
- larger magnets are stronger than smaller magnets.

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| EYFS   | In the EYFS, children:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Vocabulary                                                                                                                                                                                 |
|        | Begin to notice forces at work around them through play (eg pushing, pulling)<br>Experiment and explore with magnets and notice what they are attracted to                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Force<br>Magnet<br>Attract                                                                                                                                                                 |
|        | NC Statements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Key Knowledge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Vocabulary                                                                                                                                                                                 |
| Year 3 | <ul style="list-style-type: none"> <li>• compare how things move on different surfaces</li> <li>• notice that some forces need contact between two objects, but magnetic forces can act at a distance</li> <li>• observe how magnets attract or repel each other and attract some materials and not others</li> <li>• 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</li> <li>• describe magnets as having two poles</li> <li>• predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul> | <p>To compare how different objects move on different surfaces<br/>(table, carpet, sandpaper, ice)</p> <p>To know that friction is the resistance (force) encountered when one object or surface rubs against another.</p> <p>To know that a magnet produces an area of magnetic force around itself called a magnetic field and this is where the force operates.</p> <p>To know that magnetic forces can attract (pull) or repel (push) without the objects directly touching.</p> <p>To know that magnets can attract some materials and not others (most metals are attracted to magnets but must contain nickel, iron or cobalt)</p> <p>To know that different magnet types can vary in strength.</p> <p>To know that magnets have two poles - North and South</p> <p>To know that opposite poles are attracted to each other.</p> | <p>Surface</p> <p>Force</p> <p>Friction</p> <p>Resistance (force)</p> <p>Magnet</p> <p>North pole</p> <p>South pole</p> <p>Attract</p> <p>Repel</p> <p>Materials</p> <p>Magnetic field</p> |

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| Year 5 | <ul style="list-style-type: none"> <li>• explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>• identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li>• recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</li> </ul> | <p>To know that gravity is a force which pulls everything to the centre of the Earth.</p> <p>To know why gravity is important to our everyday lives.</p> <p>To know that weight is a measure of the force of gravity on an object.</p> <p>To know that resistance is a force that opposes or slows down another force (eg air or water)</p> <p>To know that friction is the resistance (force) encountered when one object or surface rubs against another. (Friction is not used to describe resistance between liquids or gases.)</p> <p>To know that air and water resistance can slow an object down.</p> <p>To know that the larger the surface area of the object, the more resistance it has against it.</p> <p>To know that the faster the object's motion, the greater the resistance exerted against it.</p> <p>To know that a pulley is a simple machine that can be used to change the direction of a force and can also be used to reduce the force required to lift a load.</p> <p>To know that a gear is a toothed wheel which can work together to change the speed or direction of rotation.</p> <p>(DT Link)</p> | <p>Gravity</p> <p>Force</p> <p>Earth</p> <p>Opposes</p> <p>Resistance</p> <p>Pulley</p> <p>Gear</p> <p>Lever</p> <p>Rotation</p> <p>Speed</p> <p>Exertion</p> |
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Core Knowledge - This should support pre and post-assessment and be re-capped frequently on entry slides.