



Year 1

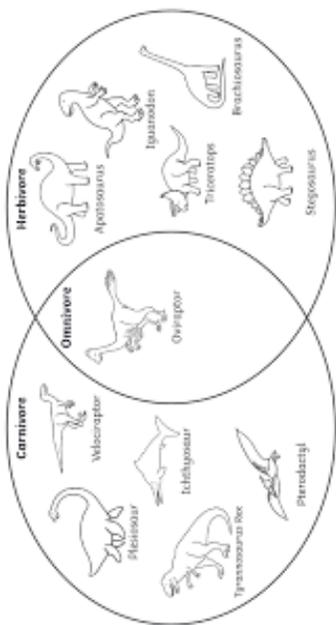
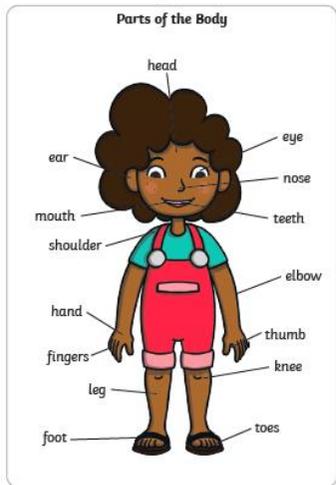
Animals including Humans	Animals, including humans	Everyday Materials	Seasonal Changes	Plants	Animals <i>including Humans</i>
Overview					
In the first term of the year, our topic is called 'Super Me' this allows a seamless transition into Year 1 and we include learning about our bodies as part of who we are, some of the differences we may have to others, and what makes each individual special and unique. Our science is very practical and includes labelling body parts using post it notes, drawing around one another in our outdoor classroom and we get to meet our school nurse. We also look closely at our human senses, naming all 5 senses and being able to identify the human body part which is associated with the sense.	During our Dinosaur Topic we focus on classifying the extinct species based on their diet. We learn some dinosaurs ate meat, some ate plants and some liked both. Using the scientific vocabulary, we learn how to complete a Venn diagram and notice patterns amongst the dinosaurs. This allows us to see some of the similar features the dinosaurs had to help them survive. As part of our art topic, we discover dinosaurs would have hatched from eggs and create these using paper mache. Afterwards we design an instruction booklet on caring for a baby dinosaur which includes their diet needs and habitat.	Our term 3 topic is 'Toys' which runs parallel to our Science unit. As we delve into old toys and compare the differences with current and modern toys, we look at a range of everyday materials which can be used to create these objects. We go on a material hunt around school to identify the range of materials in our everyday life and we then have the opportunity to handle old toys when we invite our Grandparents into school for a tea party. Throughout the term we develop our scientific vocabulary and use this within all lessons when discussing, investigating or observing materials and some of their changes.	Seasonal changes is covered throughout the year, during Art lessons and Guided Reading texts to ensure the children have the opportunity for real life observations and can physically experience each season alongside their learning. Each term the children will have the chance to record seasonal changes and make use of the school grounds and will then spend a larger amount of time on this during Term 4. We look specifically at weather patterns linked to each season and turn ourselves into weather reporters! Commenting on daylight hours, a typical summer's day and suitable clothes to wear in each season.	Our Green Fingers topic gives the opportunity to take our learning in our school garden and grounds as much as possible. We begin the term looking at and identifying parts of a plant. We learn to label a plant and go onto identify these parts using magnifying glasses and reconstructing a basic flower. Afterwards we create a 3D plant with written explanations to describe their roles. During the term we go on a local area walk, to search for and identify a range of common and wild plants in our community. We then create a journey stick of our Nature Hunt and use these to support our understanding of how plants can be different.	In the final term we revisit animals, using our 'Africa' topic as a focal point for our Science learning. We look closely at animal classifications and build upon our understanding of human features. We begin to understand how animals are grouped for a range of their physical features and characteristics. The children will then label key parts of a mammal including their hair or fur, teeth and glands to feed the young. Finally, we look at food chains, and link our previous learning of 'carnivores' from term 2 into African animals. We create a food chain with a lion, zebra and plants. Before creating our own food chain that could be found in an African nature reserve!
Working Scientifically					
In Term 1, our scientific investigations include an 'observation over time' to find out what happens to an ice cube over the afternoon. We place ice in	To support our learning of a Dinosaur's diet, we turn into scientists and have the opportunity to explore Dinosaur faeces searching for bones, plants or both!	This term we use the laptops to research Old Lego using a familiar website to find out key facts and development of	For our fourth term we make the most of the sunnier weather and carry out an observation of the sun. We use chalk and the playground to draw and	During this term the class will each plant a bean and keep a record of their bean growth with a diary. They will take measurements, water	In Term 6, we use our knowledge of the seasons and sun to design an African Sunset in Art. Including the position of the sun and the transition from

<p>a variety of locations- cupboard, under a radiator and outside and observe the changes to see which melts first. Next, we look at our ages in the class and work out whether we always get taller as get older? We split into small groups and measure ourselves and compare with our birthdays. We recap over our knowledge of the 5 human senses and identify these through a senses afternoon, tasting popcorn, listening to environmental sounds, using our hands inside a feely box, smelling a range of cooking spices and looking for camouflaged animals in their habitats.</p>	<p>We also use a range of books and texts from the school library to discover key facts and information on the dinosaur species.</p>	<p>the materials and manufacturing of Lego. We also consolidate our knowledge of materials with 2 investigations- we find out the best material to keep Tommy the Teddy dry. From metal to paper, plastic and any others we decide. We make predictions and carry out the test as a class. Lastly, we try to find the stickiest material that Tommy may eat. This time we have a go at independently making predictions and recording the results in a table.</p>	<p>track our shadows across the course of school day.</p> <p>Then, we design rockets and work in a trio to answer – ‘Do the tallest children blow the rocket the furthest?’ This allows us to recap over key understanding from Term 1, using a metre ruler and taking measurements, and we record the results in a simple table.</p>	<p>their plant, observe changes and record this in their books. Hazel Class will also have some visitors. At the beginning of the term our caterpillars will arrive and hopefully by the end of 6 weeks we will have beautiful butterflies. Finally, during our outdoor learning we will spend time looking at trees and grouping the trees according to their characteristics (deciduous vs evergreen).</p>	<p>light to darkness. We then take our seasons knowledge a step further. Answering key question ‘How are our four seasons different to other continents in the world?’ and use secondary sources to help us answer this question. Lastly, we look at the animal classifications. ‘Do all animals have four legs?’ and group some of the traditional African animals into categories and their correct classification.</p>
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Sticky Knowledge

<p>The human has 5 senses, these are sight, hearing, touch taste and smell. Your eyes let you see all the things around you. Your ears let you list to all the things around you. Your skin gives you the sense of touch. Your sense of taste comes from your tongue.</p>	<p>Carnivores are animals that mostly eat other animals (meat). Herbivores are animals that only eat plants. Omnivores are animals that eat both plants and other animals. Dinosaurs use parts of their bodies to help them survive. For example, their sharp claws can help tear meat. Or their long necks help them reach the tall leaves on a tree.</p>	<p>Objects are things that can be used. For example, a door, chair, car, table, are all objects. Materials are what an object is made from. Key materials are plastic, water, glass, wood or metal. Hard is when something cannot easily be broken or bent. If something is soft, it is easy to cut, fold, or change the shape of. If a material is stretchy, it can be pulled to make it</p>	<p>In the UK, there are four seasons each year; autumn, winter, spring and summer. In autumn the weather begins to get colder, the leaves start to fall from the trees. In winter, the weather is much colder, sometimes it snows or is cold enough to freeze and leave ice on the ground. The daytimes are the shortest in the year. In spring the weather begins to get warmed, the leaves start to grow on trees.</p>	<p>The basic parts of a flower include; roots, stem, leaves, flower and petals. A wild plant seed grows where it falls. It doesn’t need to be planted or cared for as it grows. A wild plant could be a daisy, buttercup, dandelion or some nettles. Garden plants are plants that people choose to grow in their gardens. A garden plant could be a sunflower, rose or lavender.</p>	<p>Animals are split into classifications including amphibians, birds, fish, mammals and reptiles. A human is a mammal. Mammals are animals that breathe air, grow hair or fur and feed on their mother’s milk as a baby. All reptiles breathe air. They have scales on their skin. Amphibians live in the water as babies and on land as they grow older. They have smooth, slimy skin. All birds have a beak, two legs, feathers and wings.</p>
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You smell using your nose.



longer or wider without breaking.
 Being shiny means it reflects light easily.
 If it is dull, it doesn't reflect light, look bright or appear shiny.
 If something is rough, it feels and looks uneven or bumpy.

In summer, the weather gets hotter, the daytime is long and the nights are short.
 Daylight is when it is light outside. The amount changes each season.

Weeds are wild plants that grow in places people don't want them.
 A deciduous tree loses its leaves each year.
 An evergreen tree keeps its green leaves all year round, even in the winter.

Fish live and breathe under water. They have scaly skin, fins to help them swim and they breathe through gills.

Sticky Vocabulary

head, nose, ear, neck, shoulder, arm, elbow, wrist, hand, back, chest, hip, leg, knee, ankle, foot wing, beak, tail, fin sight, smell, touch, taste, hearing, measurements, similarities, differences, observe, describe.

herbivore, omnivore, carnivore, teeth, neck, tail, claws, horns, beak, scales, plates, cold blooded, reptiles, compare, similarities, differences, describe.

wood, plastic, glass, paper, metal, rock, hard, soft, rough, smooth, shiny, dull, bendy, stiff, equipment, test, compare, differences, similarities, results.

season, spring, summer, autumn, winter, month, year, day, night, sun, moon, light, dark, observe, record, chart, test, compare, question, answer.

deciduous, evergreen, tree, leaf, flower (blossom), petals, fruit, bulb, seed, roots, stem, trunk, branches, compare, test.

amphibians, fish, reptiles, mammals, birds, classification, diagram, describe.

Skills

Identify, name, draw and label the basic parts of the human body and say which parts of the human body is associated with each sense.
 Using their observations and ideas to suggest answers to questions.

Identify and name a variety of common animals that are carnivores, herbivores and omnivores (dinosaurs).
 Identifying and classifying.
 Using their observations and ideas to suggest answers to questions.

Distinguish between an object and the material from which it is made.
 Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.

Observe changes across the four seasons.
 Observe and describe weather associated with the seasons and how day length varies.
 Observing closely, using simple equipment.

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.

Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)
 Identifying and classifying.

	Gathering and recording data to help in answering questions.	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. Observing closely, using simple equipment.	Identifying and classifying. Using their observations and ideas to suggest answers to questions.	Observing closely, using simple equipment and performing simple tests. Asking simple questions and recognising that they can be answered in different ways.	Using their observations and ideas to suggest answers to questions. Asking simple questions and recognising that they can be answered in different ways.
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Year 2

Plants	Animals, Including Humans	Everyday Materials	Living Things and Habitats	Working Scientifically <i>(beyond Science units)</i>
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Overview

<p>In this unit children have the opportunity to closely study plants and trees in the natural environment, taking measurements and making observational drawings. Children plant a seed and a bulb and compare them as they grow in our Redfield Edge Garden. They record changes in their plants in words and pictures, take measurements throughout the unit and finally draw bar charts to show the growth of the two plants. Children set up a comparative experiment to observe what plants need to grow well, and watch the germination process first hand by growing cress. Children begin to learn about plants we eat, and understand that farming involves</p>	<p>This unit, Animals Including Humans, is woven through Eating Healthy with children looking at healthy lifestyles, including the importance of exercise, healthy eating and hygiene, and Minibeasts. Through the Minibeast topic, the children will begin by looking at animal young and comparing them to their adults. They will look at how animals change as they grow up and be introduced to the life cycles of several varied common animals, including humans. They look in detail at how humans change as they grow older, drawing on their own observations. Children are introduced to the three basic needs of animals for survival (water, food and air). They will apply this knowledge, alongside</p>	<p>This unit is weaved throughout the year. At the beginning of the year, the children recap different materials and their properties. The children hunt for materials, test different materials, and decide whether they are waterproof or not waterproof. Later in the year, the children then compare the suitability of different materials for particular uses and design a waterproof case for David Attenborough’s camera crew. The children need to take all of their knowledge of materials into consideration and design this will labelled diagrams ready to send his production team.</p>	<p>Living things and their habitats is a very close link to animals, including humans. Within this unit of learning, we learn all about ‘Minibeasts’. The children will learn about the variety of habitats and the plants and animals that live there. They will also learn to tell the difference between things that are living, dead and things that have never been alive, and apply this in a range of contexts. They make observations of a local habitat and the creatures that live there, investigating conditions in local microhabitats and how they affect the minibeasts found within them. This unit allows children to research a range of global habitats and how the living things that live there are suited to their environments, and</p>	<p>Observations Over Time Which items in the bakery burn quickest?</p> <p>Pattern Seeking When I change the amount of rising agent, how much the cakes rise?</p> <p>Identifying, Classifying and Grouping</p> <p>Comparative and Fair Testing How to keep the Queen dry? Which ramp do the cars go down fastest?</p> <p>Research Using Secondary Sources What does a pharmacist do to keep people healthy?</p>
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<p>creating the right conditions for food crops to grow.</p>	<p>research from secondary sources, to suggest ways to look after pets.</p> <p>When we focus on healthy eating, the children recognise that in order for humans to live a healthy lifestyle, they need to eat the right amount of nutrition and have a balanced diet. Within this focus, the children design and make a pizza with a variety of toppings. They will also learn about being hygienic and learn about handwashing, brushing their teeth and exercising regularly.</p>		<p>introduces the idea of dependency between plant and animal species.</p>	<p>How do we keep ourselves safe around fire?</p> <p>How can we look after the seaside?</p>
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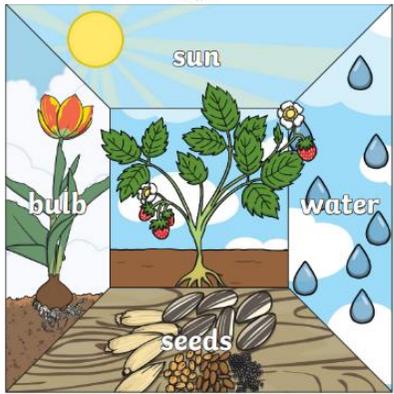
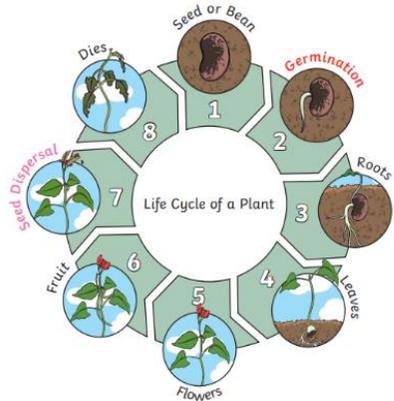
Working Scientifically

<p>During this topic, children will complete a comparative/ fair test to enquire where the healthiest place is to grow a plant. The children will grow 4 bean plants and keep them in a cupboard, windowsill, outside in the fresh air or in the fridge. Through this experiment, the children will learn what plants need to grow healthily.</p> <p>The children will complete an observation over time enquiry, grow a plant from a bulb and from a seed, and learn the difference.</p>	<p>Through the term, the children will investigate through an observation overtime experiment, which living conditions do woodlice prefer? The children will create 4 different habitats for the woodlice and every day, count how many woodlice are in each compartment.</p> <p>The children will also learn how to identify and classify different minibeasts through classifying experiment and questioning 'How can we classify and group different minibeasts?'</p> <p>We will continue this type of enquiry and find out 'What do different animals eat?' This will run alongside food chains.</p> <p>The children will work scientifically by choosing which cheese will be best for their pizza topping when learning about healthy eating. They will complete an observation over time experiment and watch the</p>	<p>Within materials, the children will undergo many investigations to deepen their understanding. They will complete pattern-seeking experiments to see whether larger objects fall faster than smaller objects and which material are easiest to squash. They will also complete a classifying investigation asking 'How can we classify and group objects based on their material?' This will deepen their understanding of materials properties and allow them to reason.</p>	<p>To deepen the children's knowledge, the children will learn through investigations such as identifying, classifying and grouping by asking the question, 'do all living things have four legs? They will also investigation through observation over time, which habitat woodlice prefer to live.</p>	
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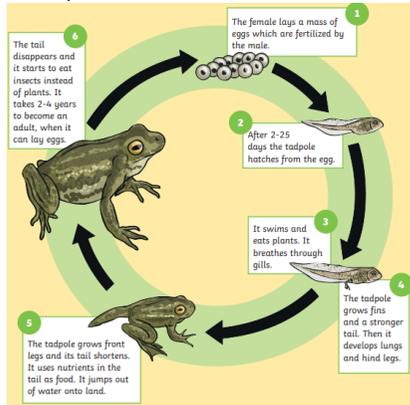
cheese melt and decide based on how well it melted.
 We will also carried out an investigation asking our school chef 'How are our school dinners healthy?' The children will undertake research using secondary sources.

Sticky Knowledge

Plants reproduce like other living things.
 A plant needs sunlight, warmth, water, seeds or a bulb to grow.
 A plant is a living thing that grows and dies like humans and other animals.



Animals, including Humans will grow from young (offspring) to their adult form.
 Each living thing has a life cycle, for example



The basic needs of all animals to survive is air, water, shelter and food.
 Exercise has a positive impact on our body.
 Each food belongs to a food group. It is important to eat a balanced diet.
 It is important to be hygienic and wash our hands before eating or we do not have germs enter our body.

Materials are what objects are made from.
 Most wood, metal, glass, plastic and rubber can be used outside.
 Paper, cardboard and most fabrics cannot be used outside.

Properties of Materials

	wood: hard, stiff, strong, opaque, can be carved into any shape.		glass: waterproof, transparent, hard, smooth.
	plastic: waterproof, strong, can be made to be flexible or stiff, smooth or rough.		metal: strong, hard, easy to wash.
	paper: lightweight, flexible.		cardboard: strong, light, stiff.
	fabric: soft, flexible, hard-wearing, can be stretchy, warm, absorbent.		rubber: hard-wearing, elastic, flexible, strong.

Suitability means having the properties, which are right for a specific purpose.

Properties is what a material is like and how it behaves for example, soft, stretchy and waterproof.

Life processes are things that all living things do. They move, breathe, sense, grow, make babies, get rid of waste and get their energy from food.

Living things have all the life processes.

Things that are dead were once living.

Never living are objects that have never lived for example, metal, plastic or rock.

A food chain shows how each animal gets its food.

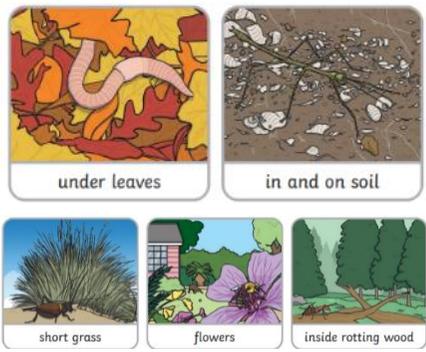
A food source is the place a living thing's food comes from.

A habitat is a natural place where something lives.

These are examples of habitats.



A microhabitat is a very small habitat within a habitat.

			 <p>under leaves in and on soil</p> <p>short grass flowers inside rotting wood</p>	
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Sticky Vocabulary

<p>growth, germinate, light, temperature, reproduce, lifecycle, sprout, shoot, seed dispersal, sunlight, water, nutrition</p>	<p>survival, water, air, food reproduce, adult, baby, offspring, kitten, calf, puppy, food chain, prey, predator, camouflage, protection exercise, hygiene, balanced diet</p>	<p>brick, fabric, elastic, foil, property, solid, waterproof, absorbent, opaque, transparent, squash, bend, flexible, twist, stretch, push, pull, roll, slide, bounce, suitability</p>	<p>living, dead, non-living, habitat, microhabitat, woodland, meadow, hedgerow, pond, food chain, food source, prey, predator</p>	<p>question, answer, observe, observing, equipment, identify, sort, group, compare, differences, similarities, describe, measurements, test, results, secondary sources record – diagram, chart</p>
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Skills

<p>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.</p>	<p>Notice that animals, including humans, have offspring which grow into adults Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p>Explore and compare the differences between things that are living, dead, and things that have never been alive Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including micro-habitats Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify</p>	<p>Asking simple questions and recognising that they can be answered in different ways Observing closely, using simple equipment Performing simple tests Identifying and classifying Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions.</p>
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and name different sources of food.

Year 3

Plants	Animals, Including Humans	Light	Forces and Magnets	Rocks	Working Scientifically <i>(beyond Science units)</i>
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Overview

<p>Within this unit, the children were work individually and in small groups to discuss the essential elements that plants need to survive. They will compare the growth of plants left in different locations with different variables and understand the effects of these changes.</p> <p>In groups they will explore how colour is able to be transported through the plant and what allows this.</p>	<p>The children begin this unit by revising the key food groups (The Eat well Plate). They will be asked to classify which foods belong to which food group and the effects of these foods on the Human Body.</p> <p>The children will then explore packaging to find out how we know about what nutritional value foods provide us with. Then they begin exploring the Human Body itself and its functions'. Firstly, they explore the skeleton, identifying its purpose and the names of key parts of the skeleton. They will finish by exploring Muscles and the function they provide to the body.</p>	<p>Throughout this unit the children will be given opportunity to explore how light the absence of darkness is. They will experiment with creating shadows with objects as well as using their bodies to observe, measure and record how shadows change throughout the day.</p> <p>The children were discuss scientific definitions such as Transparent, Translucent and Opaque. Finally, the children were explore products which are designed to support their own and others safety from the dangers that light poses.</p>	<p>In this unit, the children will explore the friction of different objects, considering how this affects their movement. They will then begin exploring magnetism and how a magnetic object contains two poles, a north and a south. They will begin to recognise that some magnets attract and some repel, exploring the concept of positives and negatives.</p>	<p>Within this unit the children will explore different types of rocks in the categories, Igneous, Metamorphic and sedimentary. They will explore the properties of these rocks in order to test and classify them accordingly. The children will discuss why they think particular rocks are used in the everyday including in objects and in buildings. Further to this, the children will explore how soils can vary in a short distance. They will test the properties of each soil by exploring how permeable each one is. Then, areas within the school grounds they will dig a small sample of soil to identify the properties of what sits beneath.</p>	<p><u>Observations Over Time</u> Which fizzy drink is the worst for your teeth?</p> <p>How to mummify a tomato?</p> <p><u>Identifying, Classifying and Grouping</u> Are all chocolates really chocolate?</p> <p>Which chocolate melts the quickest?</p> <p><u>Research Using Secondary Sources</u> Where does chocolate come from? Does the height of the pyramid effect the length of the base?</p>
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Working Scientifically

<p><u>Identifying, classifying and grouping</u> Do all plants have leaves?</p>	<p><u>Pattern Seeking</u> Do male humans have larger skulls than female humans?</p>	<p><u>Observation over time</u> Does the amount of light make a difference to the length of the bean?</p>	<p><u>Pattern Seeking</u> Does the size of the magnets change the strength of the magnet?</p>	<p><u>Pattern Seeking/Comparative and Fair Testing</u></p>
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<p>Children will have the opportunity to explore their local environment (school grounds) and tally differing plants within the area, recording their data. They will be asked to explore and present based on this data and explore reasons why.</p> <p><u>Observation over time/ Comparative and Fair Testing</u></p> <p>How does changing the position of a plant affect its growth?</p> <p>Children will be given a plant in groups which will be based in different locations both inside and outside of the school. They will observe changes at given periods and record these results. The results will then be presented in a chart to illustrate any changes that may have occurred.</p>	<p>Children will work in groups to measure and record key body measurements such as their head circumference, their feet size and their height in order to draw comparisons between genders (male and female) and also age (older taller than younger). These results will be discussed once recorded.</p> <p>Are foods that are high in energy always high in sugar?</p> <p>Children will be asked to explore food labelling in pairs to identify patterns between foods. They will be aware of the traffic light system and begin to show an understanding of how this shows foods that are both good and bad in large amounts.</p>	<p>Building on previous work in Year 2, the children will be asked to make observations of changes that occur based on the choice of their own locations. They will be encouraged to set-up the experiment and consider variables, choosing how to present their results.</p> <p>How does our shadow change through the day?</p> <p>Practically, children will use methods to draw their shadow in the school grounds at regular intervals throughout the day. They will be encouraged to identify any changes, recording these. They will then present their results and explain their findings.</p> <p>Does my shadow change the closer my hand gets to the light source?</p> <p>Children will work in small groups to identify how a shadow can change based on its angle against the light. They will record measurements of the distance to a light source and explain the impact of this on their shadow size.</p> <p><u>Comparative and Fair Testing</u></p>	<p>In this work, children will identify patterns between the size of the magnet and the strength it presents. The children will work in pairs/small groups, using different objects to test magnets' strength and record their results respectively.</p> <p><u>Identifying, Classifying and Grouping</u></p> <p>What materials are magnetic?</p> <p>Children will identify the magnetic properties of different materials such as metal and plastic etc... They will group items based on their predictions and subsequently test them to re-classify based on the results.</p> <p>Which materials can float in water? Do all objects fall through the water in the same way?</p> <p>The children will identify forces that act on objects such as cars, planes and boats. They will then make predictions as to whether an object is going to float on water. Testing objects such as rocks, plastics and different shapes the children will group and identify reasons as to why objects either did or didn't float.</p>	<p>Does the place effect the content of the soil?</p> <p>In small groups, children will collect soil samples from different locations around the school. Exploring different variables they will then test how much water passes through a sample of this soil, considering the variables they need to keep the same or change. They will be encouraged to present their results by using a diagram.</p> <p><u>Identifying, Classifying and Grouping</u></p> <p>Classifying and group rocks depending on properties</p> <p>Children will physically explore rocks in order to generate vocabulary to describe them. They will explore properties of the rocks to help group them. The children will then further identify the use of certain materials, particularly in things they might see around them in the everyday.</p> <p><u>Research Using Secondary Sources</u></p> <p>Is there a pattern of where volcanoes are in the world?</p> <p>Children will begin to explore maps as to the</p>	
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Do some colours show up more than others against a black background?

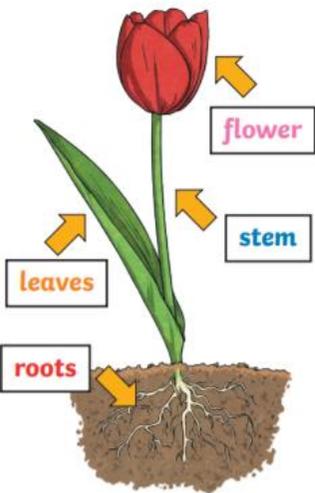
Comparative and Fair Testing

How many paperclips can one magnet attract?

In this work, the children will explore fair testing by ensuring that variables are consistent. Once the test is set, the children will be asked to record their results as to how many paperclips can be held by a magnet and present them using data. These will be discussed and explored further.

locations of volcanoes, identifying certain areas around the world where they are located. This knowledge will be built upon in UKS2.

Sticky Knowledge



Living things need food to grow and to be strong and healthy.

Plants can make their own food, but animals cannot.

To stay healthy, humans need to exercise, eat a healthy diet and be hygienic.

Animals, including humans, need food, water and air to stay alive.

Skeletons do three important jobs. Protect organs inside the body; Allow movement; and

Roots anchor plants into the ground and absorb water and nutrients from the soil.

A stem holds the plant up and carries water and

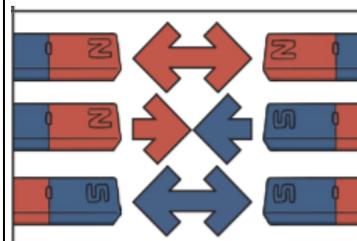
Light is a form of energy that travels in a wave from a source.

A light source is an object that makes its own light e.g. *the Sun*

Dark is the absence of light. A shadow is formed when a shape/object blocks the path of the light.

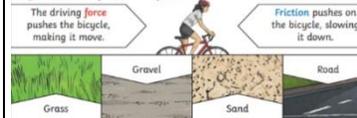
We see light as it reflects off an object back towards our eyes.

In darkness, our eyes adjust but it helps if we can see items which are reflective... e.g. *Hi-Vis jacket*.



A force is something which pushes or pulls an object

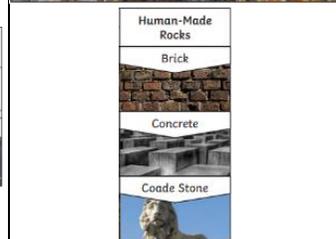
Different surfaces create different amounts of friction. The amount of friction created by an object moving over a surface depends on the roughness of the surface and the object, and the force between them.



Friction is a force that acts between two surfaces or objects are they are moving (or trying to move across each other.



Natural Rocks		
Igneous	Sedimentary	Metamorphic
Obsidian	Chalk	Marble
Granite	Sandstone	Quartzite
Basalt	Limestone	Slate



Permeable means water can squeeze through tiny gaps in the rocks

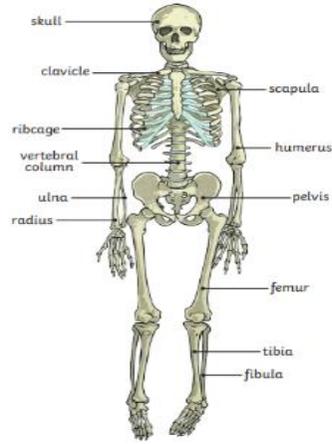
nutrients from the soil to the leaves.

The leaves make food for the plant by processing light and carbon dioxide.

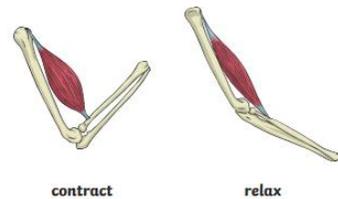
A flower makes new seeds which grow into new plants and attract pollinators which allows the plant cycle to continue.

A pollinator is an animal or insect which carries pollen between plants e.g. *birds, bees or bats*

Support the body and stop it from falling on the floor.



Skeletal **muscles** work in pairs to move the bones they are attached to by taking turns to contract (get shorter) and relax (get longer).

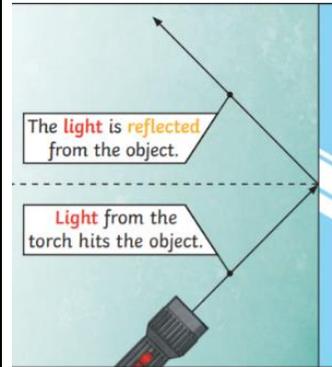


Transparent means an object will allow light to pass.

Translucent means an object will allow some light to pass.

Opaque means that no light will pass and it will be blocked.

Our eyes are very precious to us and need to be looked after. They naturally adjust to the amount of sunlight. However, too much direct light e.g. bright sunlight, can affect them.



The surface of an object is its' top layer.

Magnets are an object producing a force which pulls certain objects towards it.

Objects that are pulled towards a magnet are known as magnetic.

A magnet has an invisible force around it known as a Magnetic field.

A magnet has two poles (North and South).

Poles attract when they are the same but repel when they are the opposite.

Impermeable means water cannot pass through the rock.

Fossilisation occurs when an animals dies and is gradually covered with sediments which eventually become rock. Sediment continues to build up over thousands of years. As sea levels change and erosion/weathering occurs the fossils can be seen again.

A palaeontologist studies fossils.

Soil Is the uppermost layer of the Earth and is made from minerals, air, water and finely broken matter such as dead plants and animals.

Magma is a molten rock that stays under the ground.

The Molten rock that leaves the ground is called Lava.

Sediment is any natural material that is moved to a new place by either wind or water e.g. sand.

Sticky Vocabulary

air, water, transportation, nutrients, soil, reproduction, seed formation, seed dispersal,

skeleton, skull, bones, muscles, movement, support, protection, nutrition, function, tibia,

light source, mirror, reflect, reflective, reflection shadow, blocked transparent, translucent,

force, contact, surface, magnetic, attract, repel, poles, magnetic field, object,

soils, organic matter, fossil, fossilisation, crystals, sandstone, granite, marble, pumice absorbent, crumble

oral and written explanations, conclusion, predictions, criteria, classify, changes, data,

pollination, evaporation, plant cycle, roots, stems, trunk, flower, seeds	clavicle, skull, contract, relax, Hygiene, Food Groups, Healthy, Nutrients, Energy, Humerus, Femur, Radius, Ulna, Vertebrate, Invertebrate	opaque, damage, bright, waves, energy.	material, properties, earth, compass	sedimentary, layer, sediment, igneous, magma, lava, gas bubbles (tiny holes/spaces), metamorphic, change, squeeze, pressure	contrast, evidence, improve, secondary sources, guides, keys, construct, interpret research – relevant question equipment – thermometer, data – gather, standard units, record, classify, present record – drawings, labelled diagrams, keys, bar charts, tables
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Skills

<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>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</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>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</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>Recognise that they need light in order to see things and that dark is the absence of light.</p> <p>Notice that light is reflected from surfaces.</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</p> <p>Find patterns in the way that the size of shadows change.</p>	<p>Compare how things move on different surfaces.</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>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.</p> <p>Describe magnets as having two poles.</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p>	<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p>	<p>Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Setting up simple practical enquiries, comparative and fair tests.</p> <p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Reporting on findings from enquiries, including oral and written explanations,</p>
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displays or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.

Year 4

States of Matter

Animals, Including Humans

Living Things and Habitats

Sound

Electricity

Working Scientifically
(beyond Science units)

Overview

This 'States of Matter' unit will teach the children about the differences between solids, liquids and gases, classifying objects and identifying their properties. The children will work scientifically and collaboratively to investigate the weight of a gas. Furthermore, they will have chance to find the ideal temperature to melt chocolate. They will explore in-depth how water changes state, exploring melting, freezing, condensing as

This unit focuses on the digestive system in humans and animals and the functions of teeth. Children will learn more about herbivores, carnivores and omnivores in the context of teeth, digestion and the food chain. In addition, they will extend their understanding of food chains to more complex chains and food webs.

In this unit, children explore a variety of ways to identify, sort, group and classify living things. They learn how animals are split into 'vertebrates' and 'invertebrates' and begin to consider the differences between living things within these classifications. They use and create classification keys to group, identify and name living things from the local habitat and beyond. This unit also introduces children to the idea that environments are subject to man-made and natural changes, and that these

This 'Sound' unit focuses on how vibrations cause sounds and how sounds travel, as well as how sounds can change pitch and loudness. The children will learn about how sounds are made, carrying out demonstrations of vibrations, and completing a sound survey of their school. They will work in groups to create a human model of the way particles pass sound vibrations on, and write and star in their own documentary explaining how sound travels. The children will work in a hands-on way to explore pitch, and will use

This unit is the first introduction to studying electricity in Key Stage 2. Children will learn about what electricity is and how it was discovered. They will identify which appliances use electricity in their homes and how to keep themselves safe. Children will construct circuits, start to create pictorial circuits and conduct an investigation into how easily different types of switches can break and reconnect a circuit.

Observations Over Time
Will increasing the temperature effect the state of a solid?
What part does evaporation and condensation play in the water cycle?
How can water be recycled using a filter?
Patter Seeking
Which properties must a material have to conduct electricity?
Is there a pattern between the volume of sound and strength of vibrations?

<p>well as a particular focus on evaporation.</p>		<p>changes have a significant impact on living things.</p>	<p>their understanding of how high and low sounds are made to create their own set of pan pipes. They will have the opportunity to make a string telephone, and will use this to investigate how sounds change over distance and through different materials. The children will work scientifically and collaboratively to investigate the best material for soundproofing, in the context of making a music studio quieter. Finally, they will demonstrate their learning from the whole unit by designing and creating their own musical instrument that will play high, low, loud and quiet sounds.</p>		<p>How does the feature of an object effect pitch? Identifying, Classifying and Grouping Which materials are conductors or insulators? Which materials are solid, liquid or gas? Which objects can be recycled? Comparative and Fair Testing When is a circuit complete or incomplete? Which materials conduct electricity? What will happen if I increase the number of bulbs in a circuit? Does gas weigh anything? Can heating or cooling change a materials state? How can water change from a liquid into a solid or gas?</p>
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Working Scientifically

<p>Within this unit, the children discover whether increasing the temperature effects the state of a solid.</p> <p>They find out which materials are solid, liquid or gas.</p> <p>They investigate whether gas weighs anything.</p> <p>The children experiment to see if heating or cooling can change a materials state.</p>	<p>Within this unit, the children recognise the simple functions of the basic parts of the digestive system in humans.</p> <p>They be able to name the different types and know the function of teeth.</p> <p>Children investigate whether fizzy drinks cause tooth decay.</p> <p>To finish the unit, they recognise what is a food chain.</p>	<p>Within this unit, the children have the opportunity to identify, classify and group living things.</p> <p>They find out which environments are best suited to groups of living things.</p> <p>They research how environment change poses dangers to living things.</p>	<p>Within this unit, the children look for patterns between the volume of sound and strength of vibrations.</p> <p>They find how the feature of an object effecting pitch.</p> <p>They conduct an experiment to find out whether sounds get fainter as the distance from the sound source increases.</p> <p>They research how sounds travel from a medium to an ear.</p>	<p>Within this unit, the children discover which properties a material must have to conduct electricity.</p> <p>They investigate which materials are conductors or insulators.</p> <p>They test to find when a circuit is complete or incomplete.</p> <p>They experiment in order to discover which materials conduct electricity.</p>	<p>At what temperature does water evaporate? Do sounds get fainter as the distance from the sound source increases? Can a filter clean water enough to redrink? Research Using Secondary Sources How does environment change pose dangers to living things? What are the dangers of domestic appliances?</p>
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<p>They find out how water changes from a liquid into a solid or gas and at what temperature water evaporates.</p>				<p>The children investigate what will happen if they increase the number of bulbs in a circuit.</p> <p>They research the dangers of domestic appliances.</p>	<p>What part does evaporation and condensation play in the water cycle?</p> <p>To research how sounds travel from a medium to an ear.</p> <p>Where does our waste go?</p> <p>How can we recycle everyday rubbish?</p>
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Sticky Knowledge

<p>Materials can be grouped into solids, liquids and gases.</p> <p>Solid, liquid and gases have different properties.</p> <p>The particles of solid, liquid and gases are different.</p> <p>Gases do have mass and do weigh something.</p> <p>Some materials change state when they are heated or cooled.</p> <p>Heat can cause solids to change into liquids and vice versa.</p> <p>Heat can cause liquids to change into gas and vice versa.</p> <p>Materials melt and freeze at different temperatures.</p> <p>Water can change its state to a solid, liquid or a gas.</p> <p>Temperature can have an effect on the process of evaporation.</p>	<p>There are different parts of the digestive system which our food passes through.</p> <p>Animals have different digestive systems: birds and cows.</p> <p>Each part of the digestive system has a different function.</p> <p>Each part helps humans digest food.</p> <p>Teeth have different names and functions.</p> <p>Carnivores, Herbivores and Omnivores have teeth which are linked to their diet.</p> <p>Teeth can decay.</p> <p>There are a variety of food chains containing producers, predators and prey.</p>	<p>Living things can be grouped in a variety of ways.</p> <p>Vertebrates can be identified by observing their similarities and differences.</p> <p>Invertebrates can be identified by observing their characteristics.</p> <p>Classification keys can help group, identify and name a variety of living things in the local and wider environment.</p> <p>Environments can change and that this can sometimes pose dangers to living things.</p> <p>Changes to the environment has affected endangered species.</p>	<p>Sources of sound vibrate creating sound.</p> <p>Vibrations from sounds travel through a medium to the ear.</p> <p>There are patterns between the pitch of a sound and features of the object making it.</p> <p>Sounds get quieter as the distance between the sound source and your ear increases.</p> <p>Sounds travel as vibrations.</p> <p>As the sound waves travel, the particles of whatever they are travelling through vibrate, or move quickly on the spot. The further the vibrations travel, the more they spread out. As they spread out through more and more particles, the vibrations become smaller and smaller. This causes the sound to get quieter and quieter.</p> <p>We use devices to transmit sound over a distance.</p>	<p>When we refer to electricity, what we usually mean is electric current, which is the flow of electric charge.</p> <p>Over time, scientists have learnt how to generate an electric current which can be used safely. The two types we use are: Alternating current and direct current.</p> <p>Every solid, liquid and gas is made up of atoms.</p> <p>Every atom contains a nucleus with protons and neutrons, as well as electrons which orbit the nucleus.</p> <p>If the electrons are free to move within a material, they create an electrical charge.</p> <p>Electrical appliances use different types of electricity.</p> <p>Electrical appliances can be dangerous.</p>	
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			Some materials are better than others at absorbing sounds.	An electrical circuit can be complete or incomplete. In some materials, some of the electrons are free electrons and can move. If you create a circuit with these materials, the free electrons can be made to move in one direction, creating an electric current. These materials are called electrical conductors. When free electrons are unable to move the materials are called insulators. A switch can open and close a circuit.	
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Sticky Vocabulary

solid, liquid, gas, evaporation, condensation, particle, temperature, freezing, heating	mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine, nutrients, absorb, canine, incisor, molar producer, consumer, apex predator	vertebrates, invertebrates (+ 1 example of each) environment, habitat, classification key	vibration, wave, volume, pitch, tone, insulation	appliance, battery power, main power, circuit, series, cell, battery, wire, bulb, switch, break in circuit conductor, insulator	oral and written explanations, conclusion, predictions, criteria, classify, changes, data, contrast, evidence, improve, secondary sources, guides, keys, construct, interpret research – relevant question equipment – thermometer, data – gather, standard units, record, classify, present record – drawings, labelled diagrams, keys, bar charts, tables
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Skills

Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state	Describe the simple functions of the basic parts of the digestive system in humans.	Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a	Identify how sounds are made, associating some of them with something vibrating.	Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts,	Asking relevant questions and using different types of scientific enquiries to answer them.
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when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey.

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.

Recognise that vibrations from sounds travel through a medium to the ear. 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.

including cells, wires, bulbs, switches and buzzers. Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.

Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. 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. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.

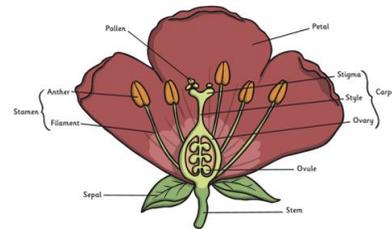
Properties of Change	Animals, Including Humans	Living Things and Habitats	Forces and Magnets	Working Scientifically <i>(beyond Science units)</i>
Overview				
<p>Through this topic the children will learn to understand the difference between synthetic and natural materials. They will have a number of feeling bags with different materials in them. Using only their touch as a sense, they have to describe the materials they can feel.</p> <p>The children will explore the difference between melting and dissolving. Once they understand the difference they will look into dissolving materials in more detail but carrying out a test to see whether different materials are soluble or insoluble in water. They children then get messy with trying to separate different materials – water, salt, flour, rice and nail. They will do this through several process such as sifting, filtering, magnetism and evaporation.</p> <p>Finally, linking to their Victorian topic. They will make a Bread and Butter pudding. This shows them irreversible changes such as baking. What they create cannot be separated back into its original materials.</p>	<p>This unit focuses on the changes that human beings experience as they develop to old age. It tackles some sensitive subjects including puberty and death.</p> <p>Children will learn about the life cycle of a human being. They will investigate the development of babies and compare the gestation period of humans and other animals. They will learn about the changes experienced during puberty and why these occur.</p>	<p>Children will recap what they learnt in Year 3 about the parts of a flower and their functions. They will move around the classroom to find the parts of a flower on flash cards.</p> <p>They then will explore how flowers are pollinated. They will discuss the fact that plants can be pollinated by insects or the wind. They will then transfer this knowledge to the life cycle of one mammal. Children can choose from a platypus (monotreme), a kangaroo (marsupial) or a rabbit (placental).</p> <p>This leads onto describing sexual reproduction in mammals. They will then discuss monotreme - mammals such as the duck-billed platypus that do not give birth to their young, but lay eggs instead. Children watch a video clip showing the moment of conception and the growth of a baby – very David Attenborough!</p> <p>The children will then do a case study on Jane Goodall learning the impact she had on the conservation of Chimpanzees in Tanzania.</p>	<p>This ‘Forces’ unit will teach the children about types of forces such as gravity, friction, water resistance and air resistance. Children will also learn about the use of mechanisms such as levers, gears and pulleys. The children will identify forces and find out about Isaac Newton and his discoveries about gravity, completing a comprehension about his life and his work. The children will look for patterns and links between the mass and weight of objects, using newton meters to measure the force of gravity. Finally, they will find out about different mechanisms, including levers, gears and pulleys, and will design their own marvellous machine. They will also work collaboratively to investigate air and water resistance, participating in challenges to design the best parachute. They will have the opportunity to work in a hands-on way to explore friction, developing their own brake pad for a scooter.</p>	<p>Observations Over Time When I change the load in the bag what will happen to the time it takes the boat to go down the guttering?</p> <p>Pattern Seeking and Fair Testing Do we all have the same size hands? /Do the tallest people have the largest feet?</p>
Working Scientifically				
<p>During Properties of change, the children will test each material for magnetism, hardness transparency, flexibility and permeability. This will be done through a fair test making sure to</p>	<p>To finish the unit, the final investigation in the Animals, Including Humans unit is about the changes to the body as humans get older, as well as comparing the life expectancy of different animals.</p>	<p>Through their Living Things and Their Habitats unit, they will classify the different ways plants reproduce through the process of pollination and fertilisation.</p>	<p>In the children’s forces and magnets unit, During some of the practical science work (designing their parachutes and scooters), the children will discuss how they can test their designs through a</p>	

keep their variables controlled to make their investigation valid. The children will explore the difference between conductors and insulators through an investigation. They will conduct their own investigation from start to finish thinking about the variables, method, equipment, data collection, results and conclusion. They will then investigate soluble and insoluble materials through discussing what variables could affect dissolving. They will discover temperature is a large contributor to materials dissolving. With this knowledge they will record their results in a bar chart.

scientific experiment. They will explore that variables other than the one being tested, can be kept the same to help make a comparative and fair test.

Sticky Knowledge

Natural materials such as stone, wood and cotton are used or worked with in the way they are found in nature. Synthetic or human-made materials are made from natural materials, but are altered with the help of heat or chemicals. Synthetic materials include plastics, polyester and Kevlar. Heat can travel easily through thermal conductors. Metals are good thermal conductors, as they allow heat to move through them. Thermal conductors are used to make items that need heat to travel through them, like a pan or a radiator. Thermal insulators do not let heat travel through them easily.



Mammals make milk to feed their babies. They are all warm blooded. The sperm travels down the male's penis and enters the female's body through the vagina. A sperm cell will fuse with the ovum, the female gamete. When this happens, the ovum is fertilised. This fertilised cell splits in half, creating two cells. These cells continue to divide, so that the number of cells doubles each

Forces are often referred to as **pushes** and **pulls**. Forces affect the movement or shape of an object. Forces can make an object start to move, stop moving, move faster or move more slowly. Forces could also make an object change its shape or cause a moving object to change direction. Gravity and air resistance are **opposing** forces in this situation. All objects exert a **gravitational pull**. However, the strength of an object's gravitational pull depends on its **mass**. The Earth is a huge object with an extremely high mass, so its gravitational pull is very strong.

Some fabrics, wood and plastics are good thermal insulators. Thermal insulators can keep heat out or in.

Electricity can travel easily through electrical conductors. Electrical insulators do not let electricity pass through them. Electrical resistance is the opposition to the flow of electricity through a material. Electrical insulators have a very high resistance and it is very hard for electricity to travel through these objects.

Electrical conductors have very low resistance and it is very easy for electricity to pass through them.

In dissolving, the solid mixes into the liquid to make a new liquid, called a solution.

Dissolving doesn't need heat to occur.

In melting, the solid changes into a liquid that is the same material. Melting needs heat to occur.

Evaporation is the process of turning from liquid into vapour. Melting, freezing, evaporating, condensing and dissolving are examples of reversible physical changes.

An irreversible change is a chemical change because a new product has been made, and irreversible because it cannot be changed back.



Adolescence - puberty

Boys' bodies start changing from around age 12 but it can be earlier or later.

Girls' bodies start changing from around the age of 9 but it can be earlier or later.

The changes don't all come at once.

These changes occur to enable reproduction during adulthood.

Puberty is the stage of development between childhood and adulthood.

Physical growth occurs so that the body changes to that of an adult, which enables reproduction.

Two parts of the brain – the hypothalamus and the pituitary gland – start to make more of some hormones.

In boys during puberty, the male sexual organs develop. This includes the testicles, scrotum and penis.

The testicles produce the hormone testosterone which stimulates the production of sperm, develops a deeper voice and bigger muscles as well as causing body and facial hair to grow.

time. Eventually, the cells will form a baby, and the heart starts to beat.

The baby will grow inside the female for the length of the pregnancy. This is known as the gestation period. At the end of the pregnancy, the baby is born.

Types of mammals

Monotremes lay eggs instead of giving birth to live babies. The only existing monotremes are the platypus and the echidna, and they live in Australia and New Guinea. They are still classed as mammals because once their babies are hatched out they do feed them milk.

Marsupials' young are born incompletely developed. They are then carried and fed in a pouch on the female's stomach until they are fully developed.

Placentals young grow inside the female's body and are born fully developed.

Jane Goodall is a British scientist who has studied chimpanzees for many years.

In 1960, Goodall was appointed as a chimpanzee researcher at the Gombe Stream National Park, in what is now called Tanzania in Africa.

She found that the chimpanzees had strong family bonds that would last for the whole of the chimpanzees' lives. She observed family members hugging, kissing, patting each other on the back, and even tickling each other!

100 years ago there were around 1 million chimpanzees in Africa.

Isaac Newton famously developed his theory of gravity when he saw an apple fall to the ground from an apple tree. The **weight** of an object is caused by **gravity** pulling it down. Objects with more **mass** have a greater weight, as the force of gravity pulls them down more strongly.

Galileo Galilei (1564-1642) was an Italian scientist and mathematician who wondered about this.

Galileo's experiment proved that all objects fall at the same rate, no matter what their mass is.

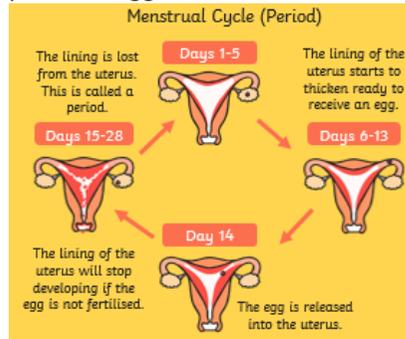
On Earth, air resistance acts on both objects. The feather has a large surface area in comparison to its mass. The hammer has a small surface area in comparison to its mass. Air resistance therefore has a greater upwards force on the feather.

If you have ever walked through water, you will have felt the effects of **water resistance** pushing against you.

Friction can be useful – for example, the soles of your shoes create friction with the ground, preventing you from slipping over.

friction can be unhelpful too – friction on a bike chain can make the bike harder to pedal.

In girls, ovaries produce the hormones oestrogen and progesterone. They also produce eggs. All girls going through puberty start their periods – this means they have started to produce eggs.



The hormones in your body that cause changes to occur during puberty may also affect your mood. You may have highs and lows and feel a bit more emotional especially near the time of your period.

Early Adulthood

This stage of development takes place from the ages of 18/19 to 39. Humans are able to take care of their physical needs completely independently.

Middle Adulthood

This stage of development takes place between 40 and 59 years of age.

Both male and female ability to reproduce declines with age. Women experience menopause in their 40s or 50s when they no longer produce eggs.

Late Adulthood / Old Age

This is the last stage of human development and takes place after the age of 60.

There are now around 200 000 left in the wild.

The species has already disappeared from 4 African countries, and chimpanzees are nearing extinction in several other countries.

Poachers hunt and kill chimpanzees for bush meat, which is sold to people living in cities.

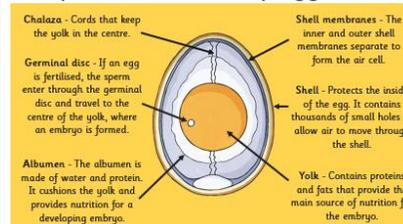
Baby chimpanzees are taken illegally to be exotic pets.

Wars and conflict in the areas in which the chimpanzees live also cause habitat loss and can result in deaths of chimpanzees.

Diseases can affect chimpanzees, and can drastically reduce their population.

Frogs, butterflies and moths are some creatures who go through metamorphosis.

All species of birds lay eggs.



	<p>There is no physical growth although mental development is possible.</p> <p>The end of the human life cycle is when a human dies. (The age at which this happens varies and is not simply dependent on physical factors.)</p> <p>Our cells do not regenerate as quickly in old age, which affects the extent to which organs can function normally.</p>			
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Sticky Vocabulary

<p>hardness, transparency, conductivity (electrical, thermal) solubility, solution, melting, freezing, dissolve, filter, evaporate, condensing, magnetic attraction, sieve, reversible, irreversible, thermal, conductor, insulator, heat, material, variable</p>	<p>womb, foetus, embryo, gestation, baby, toddler, teenager, elderly growth, development, puberty, adolescences, penis, testes, scrotum, pubic hair, sperm, menstruation, sweat glands, breasts, ovaries, gestation, vertebrates, invertebrates</p>	<p>life process, reproduction, offspring, family tree, chimpanzee, Jane Goodall, life cycle, endangered, extinct, sexual, asexual, reproduction, gamete, cell, pollen, ovule, fusion, fertilisation, pollination, cuttings, roots, male, female, sperm, ovum, penis, vagina, fertilise, pregnancy, gestation, monotreme, marsupial, young, metamorphosis, amphibian, insect, transform, larvae, pupa, nymph, egg, yolk, albumen, embryo, bird, mammal, amphibian, insect, plant, life cycle, reproduce, metamorphosis</p>	<p>Push, pull, gravity, air resistance, water resistance, friction, gravity lever, gear, pulley, Newtons, mass, weight, Galileo Galilei</p>	<p>plan, variables, measurements, accuracy, precision, repeat readings, predictions, further comparative and fair test, identify, classify and describe, patterns, systematic, quantitative measurements report data – scientific diagrams, labels, classification keys, tables, scatter graphs, bar graph and line graphs report and present – conclusions, casual relationships, explanations, degree of trust, oral and written display and presentation evidence – support, refute, ideas or arguments biology, physics, chemistry</p>
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Skills

<p>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.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>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.</p>	<p>Describe the changes as humans develop to old age.</p> <p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p>	<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Identify the effects of air resistance, water resistance and friction, which act between moving surfaces.</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Using test results to make predictions to set up further comparative and fair tests.</p> <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p>
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Year 6

Evolution and Inheritance	Light	Living Things and Habitats	Earth and Space	Electricity	Working Scientifically <i>(beyond Science units)</i>
Overview					
This unit builds on the children's learning from the Year 3 Rocks unit as	This 'Light' unit teaches the children about light, how we see, shadows, reflection and	This 'Living Things and Their Habitats' unit will teach students about the	This unit is the only Astronomy related science unit in the primary science	This unit builds on from the Year 4 Electricity unit. Children will learn to	Observations Over Time

<p>well as the Animals including Humans and Living Things and their Habitats units. As such, it is important that children have the appropriate understanding of fossils, habitats and human development in order to grasp the concepts and ideas presented to them in these lessons. Children will learn about variation and adaptation. They will be able to explore how both Charles Darwin and Alfred Wallace separately developed their theories of evolution. They will examine the scientific evidence from plants and animals that has been gathered to support the theory of evolution</p>	<p>refraction. The children learn how light travels and how this enables us to see objects. They demonstrate their knowledge by making and starring in their own television programme. The children have the opportunity to make a functioning periscope, finding out about mirrors and the angles of reflection and incidence.</p> <p>They work in a hands-on way to explore how light creates colours we see, designing coded messages. Finally, they learn about Isaac Newton and his theory of light and colour, performing a shadow puppet play about his discoveries and ideas.</p>	<p>classification of living things, including micro-organisms. The children will build on their work in Year 4 by sorting animals into groups based on their similarities and differences. They will extend their learning to find out about the standard system of classification first developed by Carl Linnaeus, choosing an animal and researching its classification. The children will have the opportunity to design their own ‘curious creature’ and classify it based on its characteristics. They will learn about micro-organisms, and conduct an investigation into the growth of mould on bread. Furthermore, the children will use play dough to create a new single celled micro-organism and explain how it is classified and why. Finally, the children will put their learning into practice by creating a field guide to the living things in their local area, showing how and why each one is classified</p>	<p>curriculum. The aim is to give children a basic overview of Earth and its place in our Solar System.</p> <p>Students will explore celestial bodies such as moons, and determine the impact they have on the planets they orbit. An example would be how our moon dictates whether the sea tide is in or out due to its gravitational pull. Pupils will also explore the movements and phases of the moon, being able to describe each aspect.</p> <p>Students will discover key facts about other planets and begin to comprehend how they move, and the differences between them.</p> <p>Pupils will then understand how the Solar System moves throughout space, understanding how the sun protects us from cosmic rays, among other things protected by the Heliosphere.</p> <p>Students will consolidate their learning of this topic to create a planetary art project.</p>	<p>represent circuits using symbols in a diagram. They will learn about two of the most important scientific inventors in the field of electricity – Thomas Edison and Nikola Tesla. Children will get the opportunity to develop their understanding of what electricity is and how to measure it. As well as conducting their own investigation, they will get the opportunity to create their own torch!</p>	<p>Does the type of liquid make a difference to how much the nail rusts?</p> <p>What will happen to the rate of cooling if I change the material the jar of water is wrapped in?</p> <p>Patter Seeking Which material would be most suitable for a soldier’s uniform?</p> <p>Does the amount of light bulbs in a circuit change the brightness?</p> <p>Does the size of a planet affect the length of its orbit?</p> <p>Do longer legs mean you can jump further?</p> <p>Do environmental factors have an impact of your health?</p> <p>Identifying, Classifying and Grouping Are all planets in our solar system the same?</p> <p>What is your favourite sweet?</p> <p>How does adaptation affect what food birds eat?</p>
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Working Scientifically

<p>Children will work scientifically by observing and raising questions about</p>	<p>They work scientifically and collaboratively to investigate refraction, carrying out some</p>	<p>Students will work scientifically by conducting research into unfamiliar</p>	<p>Pupils might work scientifically by: comparing the time of day at different</p>	<p>Students will work scientifically by systematically identifying</p>	<p>Comparative and Fair Testing How far can a rocket fly?</p>
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<p>local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.</p>	<p>fascinating experiments into the effects of bending light. Furthermore, they have the chance to predict what will happen in an exciting investigation into the visible spectrum.</p>	<p>animals and plants from a broad range of other habitats and decide where they belong in the classification system. Using classification systems and keys to identify some animals and plants in the immediate environment.</p>	<p>places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.</p> <p>Students will work scientifically by comparing the time of day at different places on Earth through internet links and direct communication; creating simple models or solar systems; constructing simple shadow clocks and sundials; calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as an astronomical clock.</p>	<p>the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or another useful circuit.</p>	<p>Will only metals conduct electricity?</p> <p>Which material cuts through apple the easiest?</p> <p>Which biscuit is the best to dunk?</p> <p>Does acidity of soil affect the flower colour?</p> <p>Research Using Secondary Sources</p> <p>Is a series of parallel circuit better for our shop signs?</p> <p>Was the Tudors diet as healthy as ours?</p> <p>What are the planets in our solar system?</p> <p>How does night and day happen?</p> <p>Who was Charles Darwin?</p>
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Sticky Knowledge

<p>Evolution is a scientific theory used by biologists. It explains how living things changed over a long time, and how they have come to be the way they are.</p> <p>We know that living things have changed over time, because we can see their</p>	<p>Light waves travel out from sources of light in straight lines. These lines are often called rays or beams of light. Rays of light travel from a light source and hit objects around us.</p> <p>The rays of light reflect, or bounce, off an object, and then travel into our eyes.</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and</p>	<p>The Universe is everything that you can think of!</p> <p>Stars exist together in places called galaxies. These are so vast that it takes starlight hundreds of thousands of years to travel from one side to the other.</p>	<p>Electricity travels at the speed of light. That's more than 186,000 miles per second.</p> <p>Power sources for electricity are either non – renewable (coal, oil, nuclear) or renewable (</p>	
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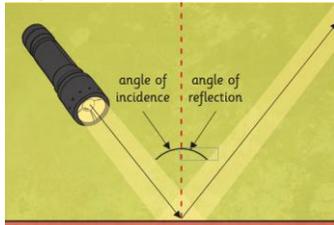
remains in the **rocks (fossils)**.

We know that the animals and plants of today are different from those of long ago. Evolutionary questions are still being actively selective breeding **Selective breeding** is the process by which humans control the breeding researched by biologists. Mary Anning was an English **fossil** collector and palaeontologist who became known around the world for finds she made in Jurassic **marine fossil** beds in the cliffs along the English in Southwest England.

Natural selection is the process where **organisms** better adapted to their environment tend to survive and produce more offspring. It is now regarded as the main process that brings about **evolution**.

Life cycles have evolved to help organisms survive to adulthood. Over time the characteristics that are most suited to the environment become increasingly common. For example, our bodies have a lot less hair on because we

This **reflection** of light allows us to see the object. **Reflection** is when light bounces off a surface, changing the direction of a ray of light. All objects reflect light. When rays of light reflect, they obey the law of reflection: The angle of **incidence** always equals the angle of **reflection**.



The law of **reflection** is what allows us to see an object **reflected** in a mirror. Light waves travel at a different speed when they go through other **transparent** materials, such as water or glass. This is known as **refraction**. **Refraction** creates illusions. Objects seen through these materials look bent or distorted. When a **ray** of white light shines on an object, the object absorbs some colours and **reflects** others. A pear **reflects** the green light and absorbs the other colours of light. It is only the green light that bounces back into our eye.

lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans. Outside of the lesson, why not record the pulse rates of family members after running a race with them!

The digestive system incorporates a range of organs such as the: stomach, intestines, liver and kidney. Without these, we wouldn't be able to transform our food into energy.

The heart pumps blood around the body. It is a powerful muscle organ that is imperative to the function of human life.

Oxygen is breathed into the lungs where it is absorbed by the blood and then transported throughout the body in the bloodstream using arteries and veins.

Muscles need oxygen to release energy from food to do work. (Oxygen is taken into the blood in the lungs; the heart pumps the blood through blood vessels to the muscles; the

Our star, the Sun, exists in a spiral-shaped galaxy called the Milky Way. There are probably at least 100,000 galaxies.

The Milky Way has a concentration of stars near its centre. This gives the Galaxy a central bulge from which arms of stars radiate out. We live in one of these arms. Like all galaxies, the Milky Way is moving; the whole galaxy is moving through space, and the stars within it are continuously moving around the galactic centre.

Solar system – Millions of years ago, a group of balls of matter were created; the planets in our Solar System.

The Sun accounts for 99% of the mass of the Solar System.

Order of the planets, starting with the one closest to the Sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus then Neptune. The Solar System is disc-like in shape.

The Sun is at the centre and the planets follow individual paths called orbits around it. They all travel in the same direction, but move at different speeds and take

wind, solar, water, geothermal, biomass).

Coal is the biggest source of energy for producing electricity. Coal is burned in furnaces that boil water and create steam.

One way of generating electricity is through hydropower. This is a process where electricity is made by water which spins turbines attached to generators.

A bolt of lightning can measure up to 3,000,000 volts, and lasts less than one second.

Electric fields work in a similar way to gravity. Whereas gravity always attracts, electric fields can either attract or repulse.

now have clothes to keep us warm.

Organisms best suited to their environment are more likely to survive long enough to reproduce. Organisms are best adapted to reproduce are more likely to do so.

Organisms reproduce and offspring have similar characteristic patterns. This is known as genetics.

Variation exists within a population (and between offspring of some plants). We can see this around the world where people look different, depending on which part of the world they come from, and/or based on the characteristics of their parents.

Competition exists for resources and mates. This means that the strongest would usually get the first pick for food and mates.

Shadows are formed when an opaque object blocks a ray of light.

muscles take oxygen and nutrients from the blood.)

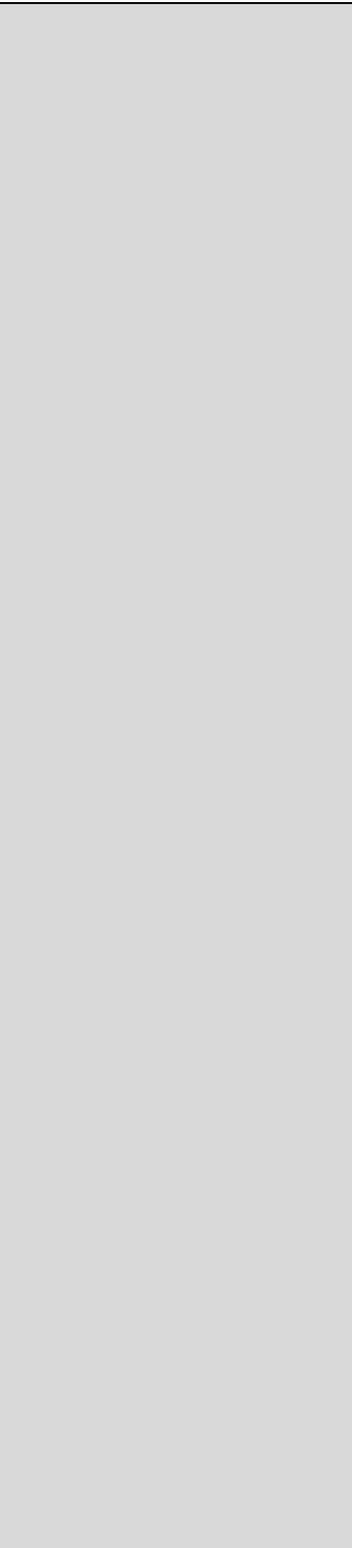
different times to complete one orbit.

The fact that the Earth travels around the Sun has been accepted for less than 400 years. Although Copernicus is usually credited with disproving that the Universe is Earth-centred, Aristarchus (310-230 B.C.) had the idea first.

Constellations – Thousands of years ago, early astronomers divided the stars into groups and drew imaginary pictures around them so that they were easy to remember.

The stars in a constellation are actually unrelated; they only appear to make these groups when viewed from the Earth. An internationally agreed system of 88 constellations is used by astronomers today. Twelve of the constellations are together known as the zodiac. Individual stars are identified within a constellation by a letter of the Greek alphabet.

Astronomers use numbers to describe a star's brightness. The larger the number given to the star, the fainter the star is. Stars classified 1-6 are visible with the naked eye. Polaris, the North Star,



			<p>lies above Earth's North Pole. From Earth we see different star patterns over the year as the Earth orbits the Sun.</p> <p>Moons – A moon is a celestial body that orbits a planet (Earth has one; Jupiter has 4 large ones and numerous smaller ones).</p>		
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Sticky Vocabulary

<p>adaptation, evolution, characteristic, reproduction, genetics, survival</p>	<p>refraction, reflection, spectrum, rainbow, shadow, periscope, incidence, Isaac Newton, prism, ray, beam, transparent, light source.</p>	<p>characteristic, classification, organism, micro-organism</p>	<p>Earth, sun, moon, solar system, axis of rotation, day, night, phases of the moon, star, constellation, celestial</p>	<p>circuit - series, parallel voltage, volts, amps</p>	<p>plan, variables, measurements, accuracy, precision, repeat readings, predictions, further comparative and fair test, identify, classify and describe, patterns, systematic, quantitative measurements report data – scientific diagrams, labels, classification keys, tables, scatter graphs, bar graph and line graphs report and present – conclusions, casual relationships, explanations, degree of trust, oral and written display and presentation evidence – support, refute, ideas or arguments biology, physics, chemistry</p>
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Skills

<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p>	<p>Recognise that light appears to travel in straight lines. 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.</p>	<p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including</p>	<p>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.</p>	<p>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</p>	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p>
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<p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>	<p>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. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>	<p>micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.</p>	<p>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.</p>	<p>components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram.</p>	<p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Using test results to make predictions to set up further comparative and fair tests. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments.</p>
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