





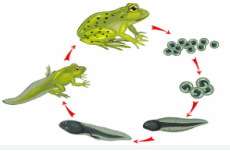
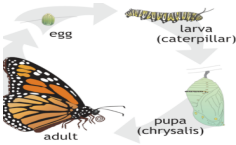

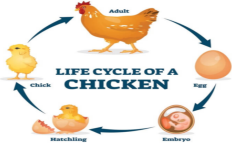







Year 2 Science Knowledge Goals Autumn 1-Materials

 <p>sponge cotton wool fabric</p>	<p>An absorbent material is a type of material which can soak up liquid. An absorbent material has small holes in it. When a liquid comes into contact with an absorbent material, the tiny holes draw in the liquid and it spreads through the material.</p>
	<p>Materials can be changed by squashing, bending, twisting and stretching. For example: rubber can be bent, twisted, stretched, and squashed. Some materials are able to be squished, bent, twisted, and stretched due to their flexibility.</p>
	<p>Something that keeps water out is waterproof. This means that water cannot pass through an object or material that is waterproof. Some examples of waterproof materials include: Plastic, Rubber and Wax</p>
	<p>To find out which material is the most absorbent, you can choose a material, place it carefully in the water and allow time for the material to adapt to being in the water and observe carefully what happens. Diagrams help us record our findings.</p>
 <p>metal</p>	<p>Materials have different properties that make them useful for different jobs. Most metals are strong, hard and shiny materials that can be hammered into different shapes without breaking. Plastic is used to make things like bags, bottles and toys because they are strong and waterproof.</p>

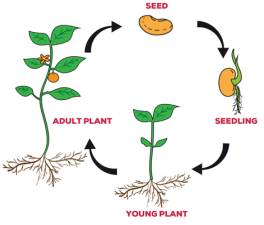
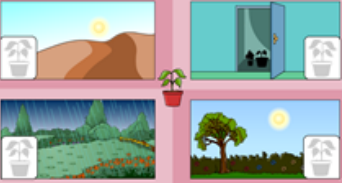


Year 2 Science Knowledge Goals Autumn 2- Animals including Humans

	<p>All Animals come in all shapes and sizes. They live in all sorts of different places. But they all need the same important things to survive: food, water, air and shelter.</p>
	<p>The 5 stages of a frog life cycle are: egg, tadpole, tadpole with legs, froglet, frog. As the frog grows, it moves through these stages in a process known as metamorphosis.</p>
	<p>There are four stages in the metamorphosis of butterflies: egg, larva, pupa, and adult.</p>
	<p>The human life cycle has six main stages: foetus, baby, child, adolescent, adult and elderly. Although we describe the human life cycle in stages, people continually and gradually change from day to day throughout all of these stages.</p>
	<p>During incubation, the hen keeps the eggs warm, dry, and protected. When the chicks are fully developed, they hatch from their eggs and are able to live on their own.</p>



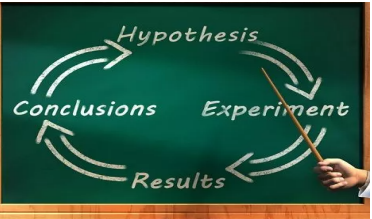
Year 2 Science Knowledge Goals Spring 1- Health and Growth

	<p>Foods can be sorted into different groups. The different food groups in a food pyramid are carbohydrates, protein, dairy, fruit and vegetables and fats and sugars. following a healthy, balanced diet is key to survival.</p>
	<p>A healthy diet is essential for good health and nutrition. To find out if our class is healthy we can ask questions about the type of food they eat and then use tables, graphs or charts to collect data.</p>
	<p>Humans need to exercise in order to be healthy. When we exercise it has an effect on our body. Exercise makes your muscles (including your heart) and your bones stronger. As your heart rate goes up, your breathing increases. Skin may become red as more blood is pumped round our body as the heart is pumping faster. The increase in breathing can cause you to be a little dehydrated. The dehydration causes you to become thirsty.</p>
	<p>When we exercise our heart rate increases. Your pulse rate measures how fast your heart is beating. You can check your heart rate by taking your pulse and counting how many times your heart beats in 1 minute (60 seconds). Your heart rate varies depending on what you're doing. It will be slower when you are resting and faster when you exercise.</p>
	<p>If someone is not leading a healthy life, we can advise them to get enough sleep so they can concentrate better and eat a balanced diet so they have more energy. It's important to look after your hygiene, this means to have a regular shower and brush your teeth at least twice a day.</p>

Year 2 Science Knowledge Goals Spring 2 -Plants

	<p>Plants have a life cycle, just like humans and other animals. The plant life cycle describes the stages the plant goes through from the beginning of its life until the end when the process starts all over again.</p> <p>The plant life cycle consists of the following stages; seed, seedling, small plant, and adult plant.</p>
	<p>To grow and survive plants need; light, water and carbon dioxide. Plants also need warmth. This is because if plants get too hot or too cold then they will die. Plants also need space to have healthy growth</p>
	<p>In every experiment we change one thing, this is called the variable e.g. the amount of water.</p> <p>Fair test is to ensure only one thing (variable) is changed.</p>
	<p>Water helps a plant by transporting important nutrients through the plant. Nutrients are drawn from the soil and used by the plant.</p>

Year 2 Science Knowledge Goals Summer 1

	<p>Recording data after an investigation is important. We can use a ruler to measure the height of a plant to see how much it has grown and then make comparisons.</p>
	<p>Scientists use data to gain understanding and make conclusions. Scientists often use graphs or tables to show their data and research findings.</p>
	<p>A conclusion is a summary of the experiment. The conclusion should state the hypothesis and tell whether the results of the experiment supported the hypothesis.</p>



Like all living things, plants need to reproduce, or make more of themselves. Some plants, called flowering plants, have a special way of reproducing. They need to move material called pollen from one flower to another. However, they need the help of other living things.


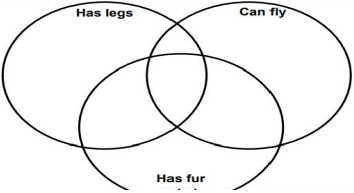

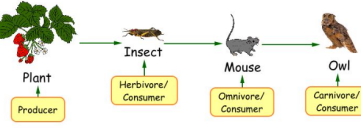


Plants have features that make them more suitable to grow in certain environments. All plants look different and these differences can be due to their environment. For example, a daisy is a wildflower that grows in the wild, meaning it was not intentionally seeded or planted.

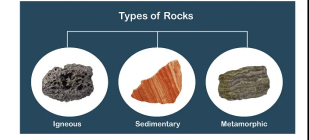
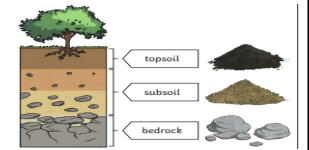
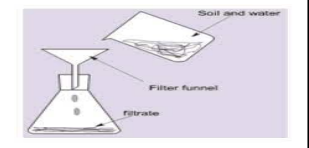

Year 2 Science Knowledge Goals Summer 2






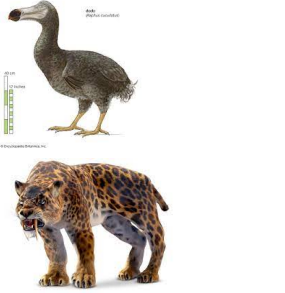

Scientists use many different apparatus to perform different tasks. In Year 2 we use Thermometers, beakers, Pippets, Measuring jugs and magnifying glasses during our investigation lessons. A magnifying glass is used to see tiny particles of an object.

<p>Characteristics of living things</p> <p>MRS GREN</p> <p>Movement Respiration Sensitivity</p> <p>Growth Reproduction Excretion Nutrition</p> 	<p>All living things do certain things to stay alive. These are called life processes. They are- movement, reproduction, sensitivity, nutrition, excretion, respiration and growth.</p>
	<p>Living things are grouped into different categories but also share some of the same characteristics. For example, animals can be sorted into groups that live in water/ live on land or both using a venn diagram.</p>
	<p>All living things breathe, eat, grow, move, reproduce and have senses. Non-living things do not eat, grow, breathe, move and reproduce. They do not have senses.</p> <p>Leaves, twigs, shells and feathers are all dead because they used to be living, but rocks, plastic bottle lids and stones have never been alive because they don't need food, water and air to survive.</p>
	<p>Every living thing needs food. Plants make their own food. These plants are then eaten by animals. These animals then become food for other animals. This makes a food chain. Green plants are called producers because they make their own food. Animals are called consumers because they get their food from plants or other animals.</p>

Year 3 Science Knowledge Goals Autumn 1





 <p>Types of Rocks</p> <p>Igneous Sedimentary Metamorphic</p>	<p>Igneous rocks - rock that has been formed from magma or lava.</p> <p>Sedimentary rocks- Rock that has been formed by layers of sediment being pressed down hard and sticking together. You can see the layers of sediment in the rock.</p> <p>Metamorphic rocks- Rock that started out as igneous or sedimentary rock but changed due to being exposed to extreme heat or pressure.</p>
 <p>topsoil</p> <p>subsoil</p> <p>bedrock</p>	<p>Soil is the uppermost layer of the Earth. It is a mixture of different things:• minerals, air, water, organic matter (including living and dead plants and animals).</p> <p>4 layers of soil (top soil, subsoil, small rocks, bedrock)</p> <p>What is soil used for? Flowers and trees need soil to grow, soil is sometimes used to build structures, soil holds up buildings like schools, houses etc. Farmers need soil to grow crops to feed people.</p>
 <p>Soil and water</p> <p>Filter funnel</p> <p>Filtrate</p>	<p>Rocks and stones can be separated from soil by (1) hand-picking, (2) winnowing, (3) sieving or sifting, (4) rock-raking.</p>
	<p>Permeable allows liquids to pass through it.</p> <p>Clay is the most porous sediment but is the least permeable. Gravel and sand are both porous and permeable, making them good aquifer materials. Gravel has the highest permeability.</p> <p>Loam soil is a mixture of clay, sand and silt soils. Because of the mixture, it's considered to be the best for planting. There are enough nutrients in the soil and the soil is able to drain efficiently. Because of these reasons, almost any plant can be grown in this type of soil.</p>


Year 3 Science Knowledge Goals Autumn 2

	<p>An animal dies. It gets covered with sediments which eventually become rock. More layers of rock cover it. Only hard parts of the creature remain, e.g. bones, shells and teeth. Over thousands of years, sediment might enter the mould to make a cast fossil. Bones may change to minerals but will stay the same shape. Changes in sea level take place over a long period. As erosion and weathering take place, eventually the fossil becomes exposed.</p>
	<p>A palaeontologist is a scientist who studies the history of life on Earth through the fossil record. Fossils are the evidence of past life on the planet and can include those formed from animal bodies or their imprints (body fossils). In 1823 Mary was the first to discover the complete skeleton of a Plesiosaurus, meaning 'near to reptile'.</p>
	<p>Fossils tell a story about the animal. They describe facts, i.e. how tall, how wide, what kind of teeth, and they describe ideas, i.e. what the dino may have eaten, how fast it may have moved due to its leg structure, and how it may have hunted.</p>
	<p>Children to research about 4 other extinct animals.</p> <ol style="list-style-type: none"> 1. Dodo is an extinct flightless bird that was endemic to the island of Mauritius: east of Madagascar in the Indian Ocean. 2. Saber-tooth tiger is any member of various extinct groups of predatory mammals, predominantly carnivores that are characterised by long, curved saber-shaped canine teeth. 3. Diplodocus is among the most easily identifiable dinosaurs, with its typical sauropod shape, long neck and tail, and 4 sturdy legs. 4. Megalodon, (big tooth), is an extinct species of mackerel shark that lived approximately 23 to 3.6 million years ago, during the Early Miocene to the Pliocene.
	<p>Excavate Remove earth carefully from (an area) in order to find buried remains.</p>



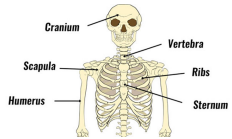

On small sites, excavation may still be carried out by manual means using tools such as picks, shovels and wheelbarrows. Then jacketing is when they put plaster around the bones to keep them safe for travel.

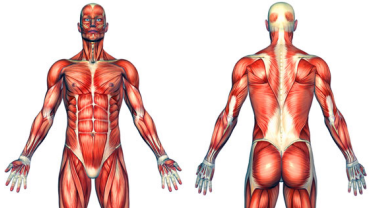
Year 3 Science Knowledge Goals Spring 1

	<p>The roots of a plant anchors and secures the plant. The leaves are the primary food-making part of the plant. The primary functions of the stem are to support the leaves; for water and minerals to be transported from roots to leaves. The plant attracts pollinators.</p>
	<p>Plants need air, light, warmth, water and nutrients to be healthy. If they are healthy, they can continue making their own food through photosynthesis. Most healthy plants are upright with green leaves.</p>
	<p>Plantlife cycles consist of five stages:</p> <ol style="list-style-type: none"> 1. Germination is the process by which a plant begins to grow from a seed. Roots form under the soil. The stem, leaves and flower emerge above the soil. 2. Pollen produced by a flower is carried by insects or blown by the wind to another flower. This process is called pollination. 3. When the pollen reaches another flower, it travels to the ovary where it fertilises the egg cells to make seeds. This process is called fertilisation. 4. These seeds are scattered by animals or the wind. This process is called dispersal. Some of the seeds will grow into new plants.
	<p>Hypothesise (predict) about where the best habitat for the survival of plants is based on knowledge about what a plant needs to survive. Plants need: water, light, soil (nutrients), air and space to stay alive.</p>

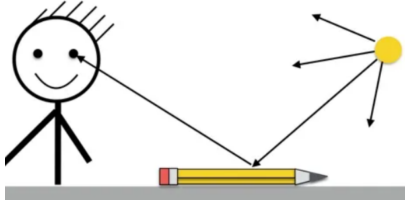

	<p>Children decide how they record and present the results of their investigation. Children will know that they can present their data using bar charts, pictograms or a table.</p>
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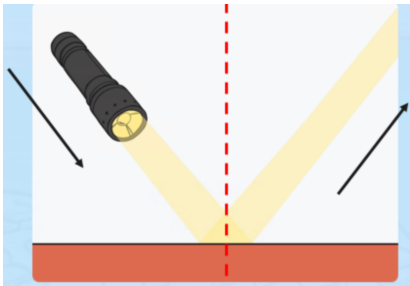
Year 3 Science Knowledge Goals Spring 2

	<p>Children can explain that all living things require nutrients to sustain optimal (good) health. As a result, children will explain the right balance of the following components of a healthy diet; carbohydrates, fats, protein, dairy, fruits and vegetables</p>
	<p>Children can explain where animals get their nutrients from using the following terminology accurately; herbivore (animal which feeds on plants), carnivore (feeds on meat) and omnivore (eats both plant and animal origin). There is an element of deduction to this process - children will explain that sharp teeth and claws are for meat.</p>
	<p>know that the skeleton has 3 different functions (protection, movement and keeping up upright). Also some main bone names, including: -spine (vertebral column) -skull (cranium) -Rib cage (thoracic cage) -phalanges (finger and toe bones). -Kneecap (patella)</p>
	<p>Humans and some other animals have skeletons for support, protection and movement. All animals are either vertebrates or invertebrates. -Know that vertebrates have a spine. -Invertebrates do not have a spine. -Understand that these groups can be broken down even further- endoskeletons, exoskeletons, hydrostatic skeletons</p>

	<p>Know that different muscles have different functions (movement/ posture/ digestion/ pumping blood etc)</p> <ul style="list-style-type: none"> - Muscles contract and expand -Muscles & skeletons work together to allow us to move -Know the difference between voluntary & involuntary muscle movements
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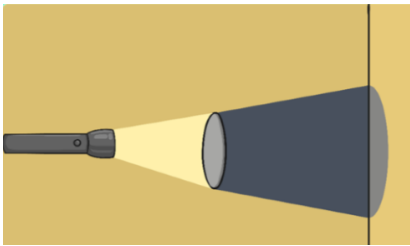
Year 3 Science Knowledge Goals Summer 1

	<p>Know that there are different sources of light (natural and human made).</p> <p>Explain what light is - type of energy</p> <p>Explain what dark is - absence of light</p> <p>Know there are two ways that light can enter our eyes:</p> <ol style="list-style-type: none"> 1. A light source (such as a bulb) creates light. 2. The other way (more common) is to see things by reflected light
	<p>Know that the Sun is essential for life on Earth and has many positive effects - source of light / plants make food / source of light / vitamin D.</p> <p>Know that there is a visible spectrum.</p> <p>Explain that UV light can cause damage to our bodies and our eyes (retina) in a range of ways: sunburn, dehydration, heatstroke, eye damage and skin cancer.</p> <p>In addition, explain how we can protect ourselves from this damage.</p>



Know that light travels in a straight line. However, when light hits an object, it is reflected (bounces off). If the reflected light hits our eyes, we can see the object.

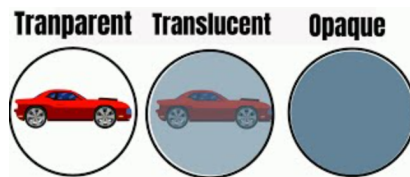
Explain that smooth, shiny surfaces such as mirrors and polished metals reflect light well. Conversely, dull and dark surfaces such as dark fabrics do not reflect light well.



Know that a shadow is an area of darkness where light (travelling in a straight line) has been blocked from reaching a surface.

Explain that shadows are formed when an object in the path of the light rays blocks the light from passing through.

In addition, explain that the light cannot go through or around the object, so a darker patch of less light is created behind the object.



Know that shadows are not reflections. A reflection is created when light bounces off an object. A shadow is caused by light being blocked.

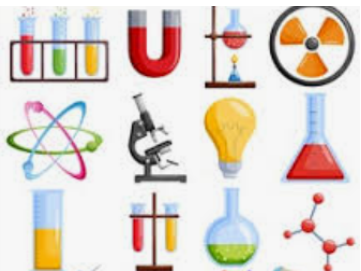


Explain with examples the meaning of transparent, translucent and opaque objects.

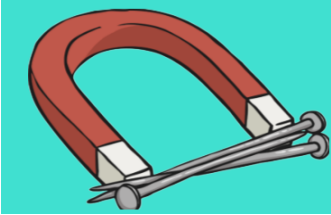


Know that shadows can be changed depending on the position of the light.

Explain how translucent, transparent and opaque objects can affect a shadow.

Year 3 Science Knowledge Goals Summer 2

	<p>Recognise and explain that scientific equipment has many different purposes. For example:</p> <ul style="list-style-type: none"> -measuring mass/distance/time/temperature/amounts -making observations -separating materials -simulating scientific processes -safety
	<p>Explain that a force is a push or pull acting on an object as a result of the object's interaction with another object. Whenever an object has been pushed or pulled, a force has acted upon the object. Explain what contact and non contact forces are.</p>
	<p>Know that friction is a force between two surfaces</p> <ul style="list-style-type: none"> - Know that friction slows an object down - Know that friction works in the opposite direction to the object moving across the surface



Explain what a magnet and magnetic field are.
Explain what magnets are made from and how they affect objects around them.