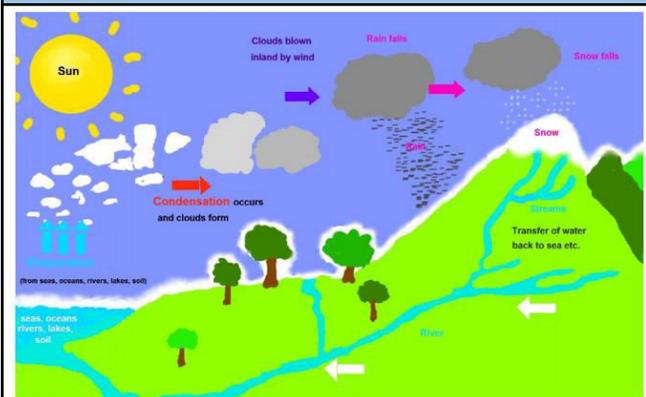


Science Focus		States of matter	Year 4	Autumn 1														
<b>What? (Key Knowledge)</b>			<b>Statutory requirements</b>															
Solid	One of the three states of matter. Solids keep their shape. The particles in a solid are very close together. Ice is the solid states of water.		Pupils should be taught to: <ul style="list-style-type: none"> <li>compare and group materials together, according to whether they are solids, liquids or gases</li> <li>observe that some materials change state when they are heated or cooled, and</li> <li>measure or research the temperature at which this happens in degrees Celsius (°C)</li> <li>identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>															
Liquid	One of the three states of matter, liquids pour and take on the shape of a container. In a liquid the particles are not as close together as in the solid form.																	
Gas	One of the three states of matter, gases fill all available space. The particles in gas are very apart from each other and moving freely. Water vapour is a gas.																	
Heating	All matter is made up of particles which have energy and move. The more energy they have the more movement there is. When a solid is heated it gains energy, the particles move more and it changes to a liquid state. When more energy (heat) is applied to a liquid more movement occurs and it changes into a gaseous state. If a gas is heated it gains more energy and takes up more space (expands).		<b>What? (Key vocab)</b> <table border="1"> <thead> <tr> <th>Spelling</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>State Change</td> <td>The process of change from one state of matter to another – this is a reversible change.</td> </tr> <tr> <td>Melting</td> <td>Changing from a solid into a liquid.</td> </tr> <tr> <td>Freezing</td> <td>Changing from a liquid into a solid.</td> </tr> <tr> <td>Evaporation</td> <td>The process of change from a liquid into a gas.</td> </tr> <tr> <td>Condensation</td> <td>The process of change from a gas into a liquid.</td> </tr> <tr> <td>Water Cycle</td> <td>The cycle of events that occur naturally in the weather systems of the Earth where water moves through its three states.</td> </tr> </tbody> </table>		Spelling	Definition	State Change	The process of change from one state of matter to another – this is a reversible change.	Melting	Changing from a solid into a liquid.	Freezing	Changing from a liquid into a solid.	Evaporation	The process of change from a liquid into a gas.	Condensation	The process of change from a gas into a liquid.	Water Cycle	The cycle of events that occur naturally in the weather systems of the Earth where water moves through its three states.
Spelling	Definition																	
State Change	The process of change from one state of matter to another – this is a reversible change.																	
Melting	Changing from a solid into a liquid.																	
Freezing	Changing from a liquid into a solid.																	
Evaporation	The process of change from a liquid into a gas.																	
Condensation	The process of change from a gas into a liquid.																	
Water Cycle	The cycle of events that occur naturally in the weather systems of the Earth where water moves through its three states.																	
Water Cycle	This depends upon the processes of evaporation, condensation and precipitation. Precipitation is water falling from the air as rain, snow, sleet or hail. Evaporation occurs on the oceans, land, lakes and rivers. Some of the cooled water vapour condenses on small particles of dust or soot present in the atmosphere and clouds containing water droplets or ice are formed. The water droplets need to reach a certain size before they begin to fall.																	

## Diagrams and Symbols



## Possible experiences

- Observe change of states over time.
- Play a game of particles – the children have to get into groups and demonstrate what the particles would look like.
- Group different objects into solid, liquid and gas depending on their properties.
- Research the melting, boiling and freezing point of different materials.
- Apply knowledge to the water cycle.

<b>Science Focus</b>	<b>Living Things and Their Habitats</b>	<b>Year 4</b>	<b>Spring 1</b>
----------------------	---	---------------	-----------------

## What? (Key Knowledge)

Living things can be grouped in a variety of ways.	Invertebrates and vertebrates Subdivided into (mammals, Birds, reptiles, amphibians, fish, arachnids, insects,
Use identification keys to identify	Follow the instructions to identify different plants and animals according to their features
Create own identification key	Write enquiring questions relating to the features of plants and animals to sort their features and identify it.
Food chains –can be effected by environmental issues	Plants are the <b>primary producers</b> in a food-chain. A snail is an example of a <b>primary consumer</b> -It eats the plant. A centipede is a fierce hunter, feeding on a variety of primary consumers. It is therefore known as a <b>secondary consumer</b> .
Recognise that environments can change and identify how it affects living things in their local environment	Habitats exist as part of a larger environment. Look for evidence as to how the environment can affect (positively and negatively) the animals that live there.
Recognise that environments can change and identify how it affects living things throughout the world	Habitats exist as part of a larger environment. Explore how environmental issues have affected different living things around the world both positive and negative– pollution, plastic pollution

## Statutory Requirements

- Recognise that living things can be grouped in a variety of ways
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- Recognise that environments can change and that this can sometimes pose dangers to living things

## What? (Key vocab)

Spelling	Definition
<b>Habitat</b>	The place where organisms live
<b>Invertebrates</b>	Animals without backbones -Two of the most commonly known ones are arachnids (spiders) and insects.
<b>Birds</b>	Birds are animals that have feathers and that are born out of hard-shelled eggs.
<b>Vertebrates</b>	Animals with backbones - The five most well known classes of vertebrates are mammals, birds, fish, reptiles, amphibians.
<b>Mammals</b>	If an animal drinks milk when it is a baby and has hair on its body, it belongs to the mammal class. e.g. dogs, cats, dolphins and whales.
<b>Fish</b>	Fish are vertebrates that live in water and have gills, scales and fins on their body.
<b>Reptiles</b>	Reptiles are a class of animal with scaly skin. They are cold blooded and are born on land e.g. snakes, lizards, crocodiles, alligators.
<b>Amphibians</b>	Amphibians are born in the water. When they are born, they breathe with gills like a fish. But when they grow up, they develop lungs and can live on land. e.g. frogs.
<b>Arthropods</b>	Any animals that have more than four, jointed legs are arthropods. Insects, spiders and crustaceans.

## Diagrams and Symbols

**Food Chain**

## Possible experiences

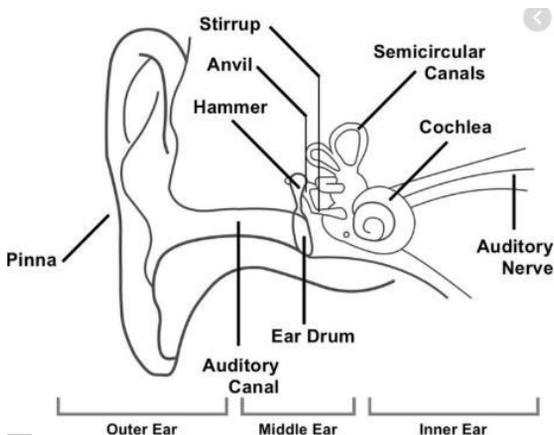
- Finding and classifying animals in the school environment
- Looking closely at the features of animals using hand lenses
- Visit to wildlife park to explore where living things are found and impacts of the environment on their survival

<b>Science Focus</b>	<b>Sound</b>	<b>Year 4</b>	<b>Spring 1</b>
----------------------	--------------	---------------	-----------------

## What? (Key Knowledge)

Sound is a form of energy.	<b>Sound energy</b> travels in the <b>form</b> of waves. Unlike light <b>energy</b> , <b>sound</b> cannot travel through a vacuum, because there are no atoms to transmit the vibration.
Sounds are made when something vibrates.	The vibrating object pushes the air out in waves, which are not like waves in water (up-and-down), but horizontally spreading outwards from the source. Particles of air knock into ones next to them. Each particle moves only a short way, with energy being transferred as a series of pulses (squashed and then spread out).
Vibrations from a sound travel through a medium to the ear.	Sounds can travel through solids, liquids and gases. Sound travels faster in water and loses its energy less rapidly than in air. Sound travels more quickly through solids and liquids than through gases.
Sounds get fainter as the distance from the sound source increases.	When <b>you</b> are standing close to an alarm clock, it seems quite loud. As <b>you</b> move <b>away</b> from the clock, the alarm <b>sounds</b> quieter, so our distance from the <b>source</b> of a <b>sound</b> will affect how loud it seems.
How we can use a scientific enquiry to answer a question.	Choosing a suitable scientific enquiry., i.e. Observations. Fair testing. Sorting and classifying. Secondary sources. Choosing equipment. Collecting data. Measuring. Recording. Analysing data. Making improvements.

## Diagrams and Symbols



## Statutory requirements

- Pupils should be taught to:**
- Identify how sounds are made, associating some of them with something vibrating
  - Recognise that vibrations from a sound 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.

## What? (Key vocab)

Spelling	Definition
vibrations	Quickly moving back and forth or up and down.
source	Where something originates or comes from.
pitch	How high or low a sound is.
volume	How loud or quiet something is.
reflection	How sound or light is thrown back by a surface.
absorption	The process of taking something into another substance.

## Possible lessons

- Survey – What different sounds can be heard?
- Comparative test – What happens to the sound of the drum when we get further away from it?
- Using a data logger
- Problem-solving – Where in the school would be the best places to put fire alarms?
- Explore – What is a ‘sound’?
- Modelling - How can we represent a sound wave?
- Comparative test – How can we alter the loudness of a sound?
- Explore – How do we change the pitch of a sound?
- Comparative test – How can we alter the loudness of a sound?
- How does the height from which a tube is dropped affect the loudness of the sound produced?
- Does the length of an elastic band affect the pitch of the sound produced?**

<b>Science Focus</b>	<b>Animals, including humans</b>	<b>Year 4</b>	<b>Summer 1</b>
----------------------	----------------------------------	---------------	-----------------

## What? (Key Knowledge)

The human digestive system	
What is digestion?	Digestion is the way the body breaks down the food we eat into smaller parts that can be used to give the body energy
The digestive system	Mouth, tongue, pharynx, oesophagus, liver, stomach, gallbladder, pancreas, large intestine, small intestine
The digestive journey	Humans put food into their mouth. Food is chewed by the teeth and mixed with saliva, swallowed and passed through the pharynx and oesophagus to the stomach. In the stomach, it is mashed into a mixture like soup and mixed with acid. The mixture passes into the small intestine, where tiny bits of food pass into the bloodstream. The remaining food goes into the large intestine. Finally, waste products leave the body.

## Human Teeth

Teeth facts	<p>'Milk' teeth grow in babies when they are about 6 months old</p> <p>20 teeth grow by the time you are around 2.5 years old</p> <p>From about age 6 you start to lose teeth until about the age of 12</p> <p>These teeth are replaced by 32 permanent teeth</p>
Types of teeth	<p>Incisors (front teeth for snipping and cutting food)</p> <p>Canines (long pointed teeth for grabbing food)</p> <p>Pre-molars and molars (back teeth for crushing and grinding food)</p>

## Possible experiences

- Compare the teeth of animals and [predict if they are carnivores, herbivores or omnivores]
- Experiments with what can go wrong with the digestive system such as: hiccups and vomiting
- Making the longest food chain possible (e.g. a paper chain)

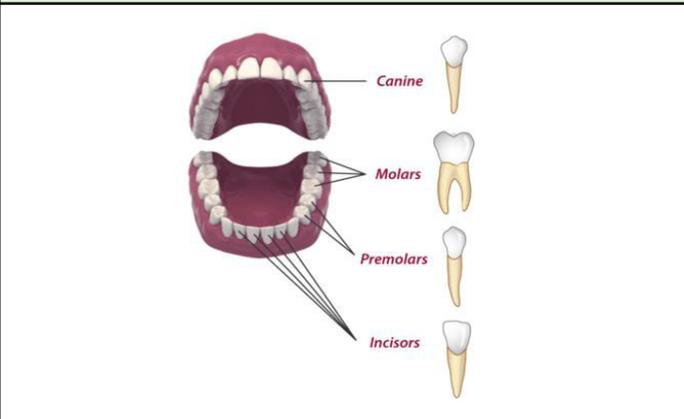
## What? (Key knowledge)

Food Chains	<ul style="list-style-type: none"> <li>• A food chain is a diagram that shows a producer (usually a green plant or algae) and consumers (who get their food by eating plants or other animals)</li> <li>• A consumer could be a predator, prey or both</li> <li>• The arrow means 'is food for'</li> </ul>
-------------	--

## What? (Key vocab)

Spelling	Definition
Energy	The property that gives humans strength
Waste	Unwanted substances that are eliminated from the body
Saliva	'Spit' that breaks down food (especially starch) in the mouth
Acid	Contains enzymes that help break down food in the stomach
Predator	Animals which eat other animals are called predators
Prey	Animals that are eaten by other animals.

## Pictures and Diagrams



<b>Science Focus</b>	<b>Electricity</b>	<b>Year 4</b>	<b>Summer 1</b>
----------------------	--------------------	---------------	-----------------

What? (Key Knowledge)	
What is electricity?	Electricity is created by generators which can be powered by gas, coal, oil, wind or solar. The electrical energy can be converted into other types of energy such as light, heat, movement or sound. Electricity is dangerous, so be careful when using electrical appliances.
What are common appliances that run on electricity?	Any appliances that need to be plugged in run on electricity. For example: Television, Computer, Microwave, Lights
What is a circuit?	Electricity can flow through the components in a complete electrical circuit. A circuit always needs a power source, such as a battery, with wires connected to both the positive (+) and negative (-) ends. (A battery is made from a collection of cells connected together). A circuit can also contain other electrical components, such as bulbs, buzzers or motors, which allow electricity to pass through. Electricity will only travel around a circuit that is complete. That means it has no gaps.
What is a switch?	You can use a switch in a circuit to create a gap in a circuit. This can be used to switch it on and off. When a switch is open (off), there is a gap in the circuit. Electricity cannot travel around the circuit. When a switch is closed (on), it makes the circuit complete. Electricity can travel around the circuit

Statutory requirements
Pupils should be taught to: <ul style="list-style-type: none"> <li>• identify common appliances that run on electricity</li> <li>• construct a simple series electrical circuit, identifying and naming its basic parts,</li> <li>• including cells, wires, bulbs, switches and buzzers</li> <li>• identify whether or not a lamp will light in a simple series circuit, based on whether or</li> <li>• not the lamp is part of a complete loop with a battery</li> <li>• recognise that a switch opens and closes a circuit and associate this with whether or</li> <li>• not a lamp lights in a simple series circuit</li> <li>• recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>

What? (Key vocab)	
Spelling	Definition
circuit	A complete route which an electric current can flow around.
Current	A flow of electricity through a wire.
Battery	A small device that provides power for electrical items.
Cell	A device used to generate electricity. A battery is an example of a cell.
Conductor	Any material that electricity can pass through or along.
Insulator	Any material that electricity cannot pass through or along.

Diagrams and Symbols	
<p><b>Would the bulb light up?</b></p>	<p>Will the bulb light?</p> <p style="color: green; text-align: center;"><b>Yes</b></p> <p>Why?</p> <p>The circuit has a battery and a bulb and is complete.</p>
	<p>Will the bulb light?</p> <p style="color: red; text-align: center;"><b>No</b></p> <p>Why?</p> <p>The circuit has no battery to provide the electrical power.</p>

Possible experiences
<ul style="list-style-type: none"> <li>• Set up circuits and predict whether the bulb will light or not.</li> <li>• Set up circuits and experiment with ways to make the bulbs brighter.</li> <li>• Set up a circuit to test materials that are conductors or insulators.</li> <li>• Set up a human circuit to show how the electrons move around.</li> <li>• Use a Venn diagram to sort and categorise appliances into battery operated, mains operated or both.</li> </ul>