

## Year 4 States of matter- Autumn 1 Term Knowledge Organiser

What should I already know?

Year 2/3 skills of comparing and grouping materials together based on their properties

### National Curriculum objectives:

- compare and group materials together, according to whether they are solids, liquids or gases
- observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.



## How has the River Humber affected life in our area?

### Key vocabulary

States of matter-materials can be one of three states: solids, liquids or gases. Some materials can change from one state to another and back again.

Solids-these are materials that keep their shape unless a force is applied to them. They can be hard, soft or even squashy. Solids take up the same amount of space no matter what has happened to them.

Liquids-liquids take the shape of their container. They can change shape but do not change the amount of space they take up. They can flow or be poured.

Gases-gases can spread out to completely fill the container or room they are in. They do not have any fixed shape but they do have a mass.

Water vapour-this is water that takes the form of a gas. When water is boiled, it evaporates into a water vapour.

Melt-this is when a solid changes to a liquid.

Freeze-liquid turns to a solid during the freezing process.

Evaporate-turn a liquid into a gas.

Condense-turn a gas into a liquid.

Precipitation-liquid or solid particles that fall from a cloud as rain, sleet, hail or snow



### Knowledge:

There are three states of matter:solids,liquids and gases. When water and other liquids reach a certain temperature, they change state into a solid or a gas. The temperatures that these changes happen at are called the boiling, melting or freezing point.If a solid is heated to its melting point, it melts and changes to a liquid. This is because the particles start to move faster and faster until they are able to move over and around each other.When freezing occurs, the particles in the liquid begin to slow down as they get colder and colder. They can then only move gently on the spot, giving them a solid structure.Evaporation occurs when water turns into water vapour. This happens very quickly when the water is hot, like in a kettle, but it can also happen slowly, like a puddle evaporating in the warm air. Condensation is when water vapour is cooled down and turns into water. You can see this when droplets of water form on a window. The water vapour in the air cools when it touches the cold surface.

Water cycle:

1. Water from lakes, puddles, rivers and seas is evaporated by the sun's heat, turning it into water vapour.
2. This water vapour rises, then cools down to form water droplets in clouds (condensation).
3. When the droplets get too heavy, they fall back to the earth as rain, sleet, hail or snow (precipitation).

### Skills and enquiry

Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.



## Year 4 All living things- Autumn 2 Term Knowledge Organiser

### What should I already know?

In Year 2, children learn about habitats and how animals can be classified by their characteristics.

### National Curriculum objectives:

- 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 makes the Earth angry?

### Key vocabulary

Organisms-this is another word that can be used to mean 'living things'.

Life processes-the things living things do to stay alive.

Respiration- a process where plants and animals use oxygen gas from the air to help turn their food into energy.

Sensitivity-the way living things react to changes in their environment.

Reproduction-the process through which young are produced.

Excretion- the process by which living things get rid of waste products.

Nutrition-food which provides living things with energy to live and stay healthy.

Habitat-the specific area or place in which particular animals or plants may live.

Environment-an environment contains many habitats and these include areas where there are both living and nonliving things.

Endangered species-a plant or animal where there are not many of their species left and scientists are concerned that the species may become extinct.

Extinct-when a species has no more members alive on the planet, it is extinct.

Classification-this is where plants or animals are placed into groups according to their similarities.

Vertebrates-animals with a backbone.

Invertebrates-animals without a backbone.

Specimen-a particular plant or animal that scientists study to find out about its species.

Characteristics-the distinguishing features or qualities that are specific to a species



### Knowledge:

To stay alive and healthy, all living things need certain conditions that let them carry out the seven life processes: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition.

Changes to an environment can be natural or caused by humans. Changes to an environment can have positive as well as negative effects. Here are some examples of things that can change an environment:

Natural- earthquakes • storms• floods• droughts• wildfires• the season

Human-Made -deforestation• pollution• urbanisation• the introduction of new animal or plant species to an environment• creating new nature reserves

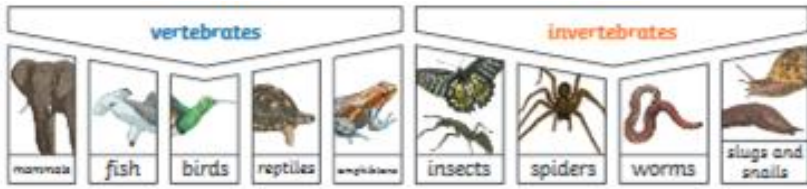
Plants and animals rely on the environment to give them everything they need. Therefore, when habitats change, it can be very dangerous to the plants and animals that live there.

Plants can be sorted into many different groups. For example:flowering plants and non-flowering plants.

Animals can be grouped into lots of different ways based upon their characteristics. You can use classification keys to help group, identify and name a variety of living things.

### Skills and enquiry

Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. Note: Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses. Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation. Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.



## Year 4 Sound- Spring Term Knowledge Organiser

### What should I already know?

In Year 3, children develop the skill of finding links and patterns. Knowledge from KS1 of our bodies to understand how our ears are used to hear.

## How did life change from the middle ages to the Tudor period?

### Key vocabulary

Vibration- a movement backwards and forwards.

Sound wave- vibrations travelling from a sound source.

Volume- the loudness of a sound.

Amplitude-the size of a vibration.A larger amplitude = a louder sound.

Pitch-how low or high a sound is.

Ear-an organ used for hearing.

Particles- solids, liquids and gases are made of particles. They are so small we are unable to see them.

Distance- a measurement of length between two points.

Soundproof-to prevent sound from passing.

Absorb sound- to take in sound energy. Absorbent materials have the effect of muffling sound.

Vacuum- a space where there is nothing. There are no particles in a vacuum.

Eardrum- a part of the ear which is a thin, tough layer of tissue that is stretched out like a drum skin. It separates the outer ear from the middle and inner ear.

Sound waves make the eardrum vibrate.



### National Curriculum objectives:

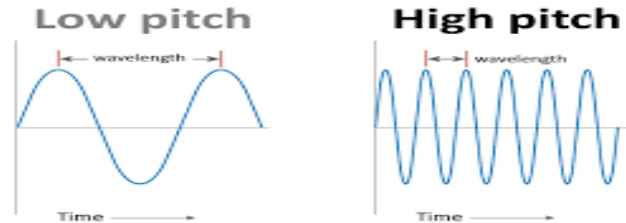
- identify how sounds are made, associating some of them with something vibrating
- recognise that vibrations from sounds travel through a medium to the ear
- find patterns between the pitch of a sound and features of the object that produced it
- find patterns between the volume of a sound and the strength of the vibrations that produced it.
- recognise that sounds get fainter as the distance from the sound source increases

### Knowledge:

Sound is a type of energy. Sounds are created by vibrations. The louder the sound, the bigger the vibration. The size of the vibration is called the amplitude. Louder sounds have a larger amplitude, and quieter sounds have a smaller amplitude.

Pitch is a measure of how high or low a sound is. A whistle being blown creates a high-pitched sound. A rumble of thunder is an example of a low-pitched sound. You can change the pitch of a sound in different ways depending on the type of instrument you are playing. For example, if you are playing a xylophone, striking the smaller bars with the beater causes faster vibrations and so a higher pitched note. Striking the larger bars causes slower vibrations and produces a lower note.

Sound can travel through solids, liquids and gases. Sound travels as a wave, vibrating the particles in the medium it is travelling in. Sound cannot travel through a vacuum. When you hit a drum, the drum skin vibrates. This makes the air particles closest to the drum start to vibrate as well. The vibrations then pass to the next air particle, then the next, then the next. This carries on until the air particles closest to your ear vibrate, passing the vibrations into your ear. Inside your ear, the vibrations hit the eardrum and are then passed to the middle and then the inner ear. They are then changed into electrical signals and sent to your brain. Your brain tells you that you are hearing a sound. If you throw a stone in a pond, it will produce ripples. As the ripples spread out across the pond, they become smaller. When sound vibrations spread out over a distance, the sound becomes quieter, just like ripples in a pond.



### Skills and enquiry

Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways. Pupils might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume.

## Year 4 Electricity- Summer Term 1 Knowledge Organiser

### What should I already know?

In KS1 materials units, children are able to associate being conductive with metals.

## Why did the Vikings and Anglo-Saxons battle for Britain?

### Key vocabulary

Electricity-the flow of an electric current or charge through a material, e.g. from a power source through wires to an appliance. Generate-to make or produce.

Renewable- a source of electricity that will not run out. These include solar, nuclear, geothermal, hydro and wind.

Non-renewable-this source of energy will eventually run out and so will no longer be able to be used to make electricity. These include fossil fuels – coal, oil and natural gas.

Appliances- a piece of equipment or device designed to perform a particular job, such as a washing machine or mobile phone.

Battery-a device that stores electrical energy as a chemical.

Circuit- a pathway that electricity can flow around. It includes wires and a power supply and may include bulbs, switches or buzzers.

Electrons-small particles with an electric charge

### National Curriculum objectives:

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, 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.

### Knowledge:

Lightning and static electricity are examples of electricity occurring naturally but for us to use electricity to power appliances, we need to make it.

\*Coal, oil and natural gases are fossil fuels which, when burnt, produce heat which can be used to generate electricity

\*Electricity can be generated from wind power used to turn windmills and hydroelectric power from water used in dams. The Sun's rays can be converted into electricity by solar panels

\*Nuclear energy is created when atoms are split. This creates heat which can be used to generate electricity. Geothermal energy is heat from the Earth that is converted into electricity.

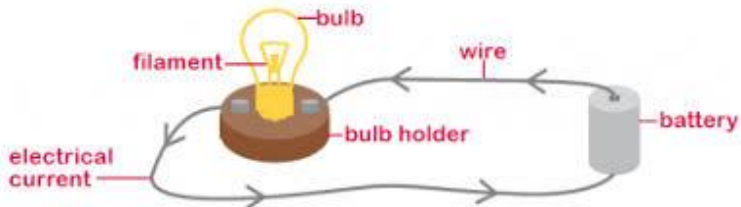
Many everyday appliances rely on electricity for them to work. Some appliances need to be plugged into a socket (mains electricity) and others have a battery to make them work.

Electricity can only flow around a complete circuit that has no gaps. There must be wires connected to both the positive and negative end of the power supply/battery. Switches can be used to open or close the circuit. When off, a switch 'breaks' the circuit to stop the flow of electrons. When the switch is on, the circuit is complete and the electrons are able to flow around the circuit. A conductor of electricity is a material that is made up of free electrons which can be made to move in one direction, creating an electric current. Metals are good conductors. Electrical insulators have no free electrons and so no electric current can be made. Wood, plastic and glass are good insulators. There are two types of electric current:

\*Mains electricity: power stations send an electric charge through wires to transformers and pylons. Then, underground wires carry the electricity into our homes via wires in the walls and out through plug sockets

\*Battery electricity: batteries store chemicals which produce an electric current. Eventually, even rechargeable batteries will stop producing an electric current.

### Household Devices & Appliances



### Skills and enquiry

Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. Pupils should be taught about precautions for working safely with electricity. Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.

## Year 4 Animals including humans- Summer Term 2 Knowledge Organiser

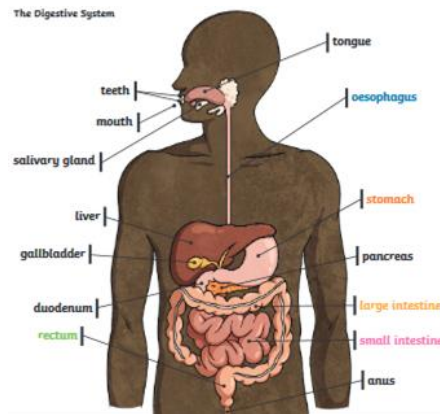
### What should I already know?

In Year 2, children construct and interpret simple food chains.

### National Curriculum objectives:

- describe the simple functions of the basic parts of the digestive system in humans
- 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

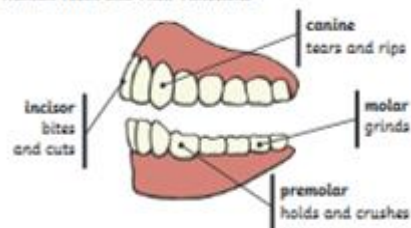
### Knowledge:



### DIGESTIVE ORGANS AND THEIR FUNCTION

Mouth	reduce to small pieces, liquefy, break down	taste swallow
Oesophagus		transport
Stomach	mix, reduce to small pieces, protein digestion acid protection against bacteria	
Small intestine	breakdown of carbohydrates, proteins and fats absorption of nutrients, vitamins, nutrients and water	
Large intestine	concentration via removal of water flora fermentation	absorption
Rectum		storing
Anus		excreting

### Human Teeth and Their Functions



Some people have wisdom teeth but they have no function now.

### Key vocabulary

Digest-break down food so it can be used by the body.

Oesophagus- a muscular tube which moves food from the mouth to the stomach.

Stomach-an organ in the digestive system where food is broken down with stomach acid and by being churned around.

Small intestine- part of the intestine where nutrients are absorbed into the body.

Large intestine-part of the intestine where water is absorbed from remaining waste food.

Stools are formed in the large intestine.

Rectum- part of the digestive system where stools are stored before leaving the body through the anus.

Herbivore -an animal that eats plants.

Carnivore- an animal that feeds on other animals.

Omnivore- an animal that eats plants and animals.

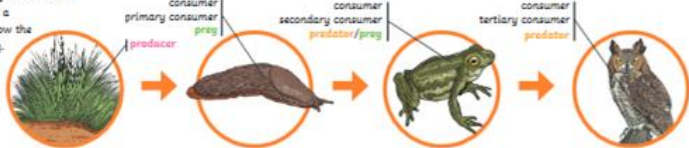
Producer-a plant that produces its own food.

Predator- an animal that hunts and eats other animals.

Prey-an animal that gets hunted and eaten by another animal.

### An Example of a Food Chain

The arrows in a food chain show the flow of energy.



### Skills and enquiry

Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions. Pupils might work scientifically by: comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images.