

LKS2

Year B

Humans (Y4)



Pupils should be taught to (Y4)

- ↻ 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.

TAF:

- The pupil can name, locate and describe the functions of the main parts of the digestive, musculoskeletal, and circulatory systems, and can describe and compare different reproductive processes and life cycles, in animals
- The pupil can construct and interpret food chains.

Prior learning

- Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)
- Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans)
- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans)
- 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. (Y3 - Animals, including humans)

Future learning

- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. (Y6 - Animals, including humans)
- Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans)
- Describe the ways in which nutrients and water are transported within animals, including humans. (Y6 - Animals, including humans)

Vocabulary

Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain

Common Misconceptions

Some children may think:

- arrows in a food chains mean 'eats'
- the death of one of the parts of a food chain or web has no, or limited, consequences on the rest of the chain
- there is always plenty of food for wild animals
- your stomach is where your belly button is
- food is digested only in the stomach
- when you have a meal, your food goes down one tube and your drink down another
- the food you eat becomes "poo" and the drink becomes "wee".

Scientists

Joseph Lister-Antiseptic
Ivan Pavlov- Digestive System Mechanisms
Washington & Lucius Sheffield- Toothpaste in a tube

National Curriculum additional Notes Y4

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.

LKS2
Year B
Sound (Y4)



Pupils should be taught to (Y4)

- ↪ 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 Y5/6
- ↪ 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.

TAF:

- The pupil can use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard.
- The pupil can describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source.

Prior learning

- Explore how things work. (Nursery – Sound)
- Describe what they see, hear and feel whilst outside. (Reception – Sound)
- Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)

Future learning

- find patterns between the pitch of a sound and features of the object that produced it Y5/6
- Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition. (KS3)
- Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound. (KS3)
- Sound needs a medium to travel, the speed of sound in air, in water, in solids. (KS3)
- Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. (KS3)
- Auditory range of humans and animals. (KS3)
- Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound. (KS3)
- Waves transferring information for conversion to electrical signals by microphone. (KS3)

Vocabulary

Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation

Common Misconceptions

- Pitch and volume are frequently confused, as both can be described as high or low. Pitch is discussed in depth in Y5/6 sound revision unit
- Some children may think:
 - sound is only heard by the listener
 - sound only travels in one direction from the source
 - sound can't travel through solids and liquids
 - high sounds are loud and low sounds are quiet.

Scientists

Alexander Graham Bell -Invented the telephone

National Curriculum additional Notes Y4

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.

LKS2

Year B

Rocks, Soil and Fossils (Y3)



Pupils should be taught to (Y3)

- ↪ compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- ↪ describe in simple terms how fossils are formed when things that have lived are trapped within rock
- ↪ recognise that soils are made from rocks and organic matter.

TAF:

- The pupil can use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved; and describe how fossils are formed and provide evidence for evolution.
- The pupil can group and identify materials, including rocks, in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties.

Prior learning

- Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)
- Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)
- Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)
- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)

Future learning

- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. (Y6 - Evolution and inheritance)
- The composition of the Earth. (KS3)
- The structure of the Earth. (KS3)
- The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. (KS3)

Vocabulary

Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil

Common Misconceptions

Some children may think:

- rocks are all hard in nature
- rock-like, man-made substances such as concrete or brick are rocks
- materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer 'natural'
- certain found artefacts, like old bits of pottery or coins, are fossils
- a fossil is an actual piece of the extinct animal or plant
- soil and compost are the same thing.

Scientists

Mary Anning- Fossil hunter Standing on the Shoulders of Giants PSTT resource
Dr Anjana Khatwa Geologist
William Smith Fossils strata
Inge Lehrmasn -Earth's Mantle

National Curriculum additional Notes Y3

Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.

Pupils might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed.

LKS2

Year B

Materials- States of Matter (Y4)



Pupils should be taught to (Y4)

- ↻ 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.

TAF:

The pupil can describe the characteristics of different states of matter and group materials on this basis; and can describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle.

Prior learning

- Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)
- Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)
- Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)
- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)

Future learning

- 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. (Y5 - Properties and changes of materials)
- Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. (Y5 - Properties and changes of materials)
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. (Y5 - Properties and changes of materials)
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials)
- Demonstrate that dissolving, mixing and changes of state are reversible changes. (Y5 - Properties and changes of materials)
- 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. (Y5 - Properties and changes of materials)

Vocabulary

Solid, liquid, gas, state change, melting,

Common Misconceptions

Some children may think:

- 'solid' is another word for hard or opaque
- solids are hard and cannot break or change shape easily and are often in one piece

freezing,
melting
point, boiling
point,
evaporation,
temperature,
water cycle

- substances made of very small particles like sugar or sand cannot be solids
- particles in liquids are further apart than in solids and they take up more space
- when air is pumped into balloons, they become lighter
- water in different forms – steam, water, ice – are all different substances
- all liquids boil at the same temperature as water (100 degrees)
- melting, as a change of state, is the same as dissolving
- steam is visible water vapour (only the condensing water droplets can be seen)
- clouds are made of water vapour or steam
- the substance on windows etc. is condensation rather than water
- the changing states of water (illustrated by the water cycle) are irreversible
- evaporating or boiling water makes it vanish
- evaporation is when the Sun sucks up the water, or when water is absorbed into a surface/material.

Scientists

Joseph Priestly – Discovered oxygen

Lord Kelvin -Absolute zero (temperature)

Anders Celsius -Temperature Scale

Daniel Fahrenheit Temperature Scale / Invention of the Thermometer

George Washington Carver- chemist

National Curriculum additional Notes Y4

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.

Note: Teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning.

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.

LKS2
Year B
Plants (Y3)



Pupils should be taught to (Y3)

- ↪ identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- ↪ 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
- ↪ investigate the way in which water is transported within plants
- ↪ explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

TAF:

- The pupil can name, locate and describe the functions of the main parts of plants, including those involved in reproduction and transporting water and nutrients.

Prior learning

- Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants)
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants)

Future learning

- Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
- Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. (KS3)

Vocabulary

Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)

Common Misconceptions

Some children may think:

- plants eat food
- food comes from the soil via the roots
- flowers are merely decorative rather than a vital part of the life cycle in reproduction
- plants only need sunlight to keep them warm
- roots suck in water which is then sucked up the stem.

Scientists

Joseph Banks- Botanist
Ahmed Mumin Warfa - Botanist

National Curriculum additional Notes Y3

Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction.

Note: Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens.

Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured

water and observing how water travels up the stem to the flowers.