



Year 4: Science



Block 1 – Biology Animals including Humans – teeth and digestion

Overview of unit:	Substantive Knowledge:	Disciplinary Knowledge:
<p>In Year 4, pupils should be taught to describe the simple functions of the basic parts of the digestive system in humans and to identify the different types of teeth in humans and their simple functions.</p>	<p>Pupils will learn:</p> <ul style="list-style-type: none">• The human digestive system contains a number of organs including the mouth, stomach, oesophagus, and intestines.<ul style="list-style-type: none">- The digestive system contains a number of organs including the mouth, oesophagus, stomach, and intestines.- The digestive system breaks down food so that its nutrients can be absorbed into the bloodstream.• The main types of human teeth are incisors, canines, molars, and premolars.<ul style="list-style-type: none">- Removing plaque from teeth (by brushing) will prevent tooth decay.- Food and drinks that contain sugar and acid can damage the enamel on teeth.• Each type of tooth looks different and has a different function.<ul style="list-style-type: none">- Different animals have different kinds of teeth, for example, carnivores have large canines for eating meat.	<ul style="list-style-type: none">• DC1: Ask relevant questions and use different types of scientific enquiries to answer them.• DC2: Plan simple scientific enquiries.• DC3: Use a range of equipment.• DC4: Make careful observations.• DC5: Record findings using simple scientific language, drawings, and labelled diagrams.• DC7: Report on findings from enquiries, including oral and written explanations.• DC8: Use models to represent a scientific concept or process.

Sequence:

In Year 3, pupils learned about the skeleton, muscles and nutrition. This unit adds a further layer to pupils' knowledge of the human body – human teeth and the human digestive system. In addition to this, across a range of biology units, pupils have learnt about the classification of animals into different groups and they also know what carnivores, herbivores and omnivores are. Pupils also add a further layer to their understanding of animal bodies by discovering the different types of teeth animals have.

Block 2 – Chemistry States of Matter

Overview of unit:	Substantive Knowledge:	Disciplinary Knowledge:
In Year 4, pupils should be taught to compare and group materials together, according to whether they are solids, liquids or gases. Pupils should also 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. In addition to this, pupils should identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	<p>Pupils will learn:</p> <ul style="list-style-type: none"> ● Materials can be grouped according to whether they are solids, liquids, or gases. <ul style="list-style-type: none"> - The three states of matter are solids, liquids, and gases. ● Materials can change state when they are heated or cooled—this happens at different temperatures for different materials. <ul style="list-style-type: none"> - Freezing is the change of state from a liquid to a solid. - Melting is a change of state from a solid to a liquid. - The melting point is the temperature when a solid changes to liquid. - Evaporation is the change of state from liquid to gas. - Rate of evaporation is affected by temperature. ● Evaporation and condensation are key processes in the water cycle. <ul style="list-style-type: none"> - Condensation is the change of state from gas to liquid. 	<ul style="list-style-type: none"> ● DC1: Ask relevant questions and use different types of scientific enquiries to answer them. ● DC3: Use a range of equipment. ● DC4: Make careful observations. ● DC5: Record findings using simple scientific language, drawings, and labelled diagrams. ● DC7: Use results to draw simple conclusions and make predictions. ● DC8: Use models to represent a scientific concept or process.

Sequence:

Pupils have classified and sorted materials according to their properties from EYFS, through Key Stage 1 and in Year 3. For example, pupils have been taught that materials can be hard, soft, shiny, dull, waterproof, absorbent, opaque, transparent, translucent, or magnetic. Pupils have also considered and investigated how the properties of different materials mean that those materials have certain uses. In Year 3, pupils compared and grouped different kind of rocks based on their appearance and physical properties. Through this unit pupils add the terms solid, liquid and gas to their understanding of how objects can be grouped and classified.

Block 3 and 4 – Biology Classification and the environment

Overview of unit:	Substantive Knowledge:	Disciplinary Knowledge:
In Year 4, pupils should be taught to recognise that living things can be grouped in a variety of ways and to explore and use classification keys to help group, identify and name a variety of living things within their local and wider environment. Pupils should also be taught to recognise that environments can change and that this can sometimes pose dangers to living things. Within this unit, a statement	<p>Pupils will learn:</p> <ul style="list-style-type: none"> ● Living things can be grouped in a variety of ways. <ul style="list-style-type: none"> - All organisms display the seven characteristics of life. - Vertebrates are animals with a backbone. - Invertebrates are animals without a backbone. 	<ul style="list-style-type: none"> ● DC1: Ask relevant questions and use different types of scientific enquiries to answer them. ● DC3: Use a range of equipment. ● DC4: Make careful observations. ● DC5: Record findings using simple scientific language, drawings, and labelled diagrams. ● DC6: Present data as a pictogram.

<p>from the Year 4 'animals, including humans' thread is taught alongside the classification of animals within habitats. Pupils are also taught to construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<ul style="list-style-type: none"> • Classification keys can be used to help group, identify and name living things. <ul style="list-style-type: none"> - Food chains show the feeding relationships between organisms and therefore the flow of energy in an ecosystem. - Classification keys can be used to identify a living thing, or decide which group it belongs to by answering questions. - Classification keys can be used to identify flowering plants as these plants produce flowers and fruits. • Environments can change and this can sometimes pose dangers to living things. <ul style="list-style-type: none"> - A habitat is the natural home of a plant or animal. - Any change in an environment (caused naturally or by humans) will affect the organisms living there. - Human activities are releasing gases (such as carbon dioxide) into the atmosphere which are causing global warming. - Environmental changes can have a negative or positive impact on the environment. 	<ul style="list-style-type: none"> • DC7: Report on findings from enquiries, including oral and written explanations. • DC8: Use models to represent a scientific concept or process.
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Sequence:

This is the second biology unit for Year 4. This unit sees pupils revisit habitats and living things. Pupils apply their knowledge of common plants and animals from Year 1, the needs that animals have, food chains and habitats from Year 2 and the needs that plants have and the difference between a vertebrate and an invertebrate from Year 3. Earlier in Year 4, pupils also revisited the idea of carnivores, herbivores, and omnivores. In addition, pupils also bring with them additional knowledge from Year 2: the environment, how environments can change and the ways in which environments can be protected from.

Block 5 – Physics Sound

Overview of unit:	Substantive Knowledge:	Disciplinary Knowledge:
<p>In Year 4, pupils should be taught to identify how sounds are made, associating some of them with something vibrating and to recognise that vibrations from sounds travel through a medium to the ear. Pupils should also be taught to find patterns between the pitch of a sound and features of the object that made it in addition to finding patterns between the</p>	<p>Pupils will learn:</p> <ul style="list-style-type: none"> • Sounds are made when something vibrates. <ul style="list-style-type: none"> - All sounds are made by vibrations. • Vibrations from sounds travel through a medium to the ear. <ul style="list-style-type: none"> - Sound travels through solids, liquids, and gases as sound waves. 	<ul style="list-style-type: none"> • DC2: Plan simple scientific enquiries. • DC3: Use a range of equipment. • DC4: Make careful observations. • DC5: Record findings using simple scientific language, drawings, and labelled diagrams. • DC7: Report on findings from enquiries, including oral and written explanations.

<p>volume of a sound and the strength of the vibrations that produced it. Pupils should also be taught to recognise that sounds get fainter as the distance from the sound source increases</p>	<ul style="list-style-type: none"> - Inside the ear sound waves cause the eardrum to vibrate, this then causes the inner ear to vibrate and send signals to the brain so we hear. • The pitch of a sound is affected by how quickly an object vibrates. <ul style="list-style-type: none"> - The faster the vibration, the higher the pitch of the sound produced. • The volume of a sound is determined by the strength of the vibrations that produced it. <ul style="list-style-type: none"> - The larger the vibration, the louder the volume of sound produced. • Sounds get fainter as the distance from the sound source increase. 	
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Sequence:
This is the first time that pupils have studied sound in science and will be the only time they study sound in science in both Key Stage 1 and Key Stage 2. Previous knowledge that this unit builds upon is that of solids, liquids and gases, Pupils discovered the difference between solids, liquids and gases earlier in Year 4 and within this unit, they find out how sound can travel through them. Understanding the formation of matter within each will support pupils in accessing this content. This unit also builds on pupils’ knowledge of the human body and how it works – in particular their knowledge of one of the five senses – hearing. In addition, this unit will link to pupils’ work within music and from this subject, pupils may bring with them an understanding of the terms pitch and volume as well as an understanding of how instruments produce sounds.

**Block 6 – Physics
Electricity**

Overview of unit:	Substantive Knowledge:	Disciplinary Knowledge:
<p>In Year 4, pupils should be taught to identify common appliances that run on electricity. It states that they should also be taught to construct a simple series electrical circuit, identifying, and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Pupils should also be able to 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, and to recognise that a switch opens and closes a circuit whilst associating this</p>	<p>Pupils will learn:</p> <ul style="list-style-type: none"> • Identify common appliances that run on electricity. <ul style="list-style-type: none"> - Electricity (electrical current) flows through wires and is used to make devices and appliances work. • The brightness of a lamp or the volume of a buzzer is associated with the number and voltage of cells used in the circuit. <ul style="list-style-type: none"> - A circuit is a complete loop of wire which lets electricity flow. 	<ul style="list-style-type: none"> • DC3: Use a range of equipment. • DC4: Make careful observations. • DC5: Record findings using simple scientific language, drawings, and labelled diagrams. • DC7: Use results to draw simple conclusions and make predictions.

with whether or not a lamp lights in a simple series circuit. In addition, pupils should be taught to recognise some common conductors and insulators and to associate metals with being good conductors.

- Adding more batteries to a circuit makes the light bulbs brighter.
- **Switches can be used to turn components on and off in a circuit.**
 - A switch can change a circuit to be complete or incomplete, turning components on and off.
- **Circuit symbols are used when representing a simple circuit in a diagram.**
- **Recognise common conductors and insulators.**
 - Conductors are materials that allow electricity to pass through them.

Sequence:

This unit is the first time pupils study electricity however, prior to this unit, pupils have studied two other forms of energy: light and sound. This unit therefore adds to their understanding of different forms of energy including how they are formed or produced, how they travel and how they behave. The knowledge in this unit also builds on pupils' understanding of the properties of materials and the different ways that materials can be grouped or classified – adding the terms conductor and insulator to pupils' vocabularies.