Science: Year 3/4 Cycle A
Animals including humans: Teeth and human nutrition (Autumn 1)

Key Vocabulary

Gums	connective tissue surrounding the teeth.
Incisors	a narrow-edged tooth at the front of the mouth, adapted for cutting.
Molars	a grinding tooth at the back of a mammal's mouth.
Canines	the sharp, tearing teeth found at the side of the mouth behind the incisors.
Dentist	a person who is qualified to treat diseases and other conditions that affect the teeth and gums,
Nutrients	Nutrients are the substances in food that our bodies process to enable it to function
Carbohydrates	These are an important source of energy in a healthy diet. Starchy and sugary foods are high in carbohydrates.
Sugar	A type of carbohydrate.
Protein	Proteins are a vital part of a healthy diet. Protein-rich foods include **fish, meat, eggs** and **beans**. Your body uses proteins to make new cells for **growth**, and **repair** damaged tissues
Fibre	fibre is plant material that cannot be digested by the body. Dietary fibre helps the digestive system to move the food we eat through the intestines and push the waste material out of the body.
Fat	A source of energy.
Water	A liquid which hydrates the body.

Key facts

- Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing).
- Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need.
- Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients.

SC1: Scientific concepts (NC Statements).

- Identify the different types of teeth in humans and their simple functions.
- 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.

SC2: Scientific skills.

- Compare the teeth of carnivores and herbivores, and suggest reasons for differences.
- Can identify the teeth in their mouth (make a dental record).
- Finding out what damages teeth and how to look after them – presenting their findings orally, pictorially or written.
- Compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat.
- Research different food groups and how they keep us healthy and design meals based on what they find out.

SC3: Why don't you?

- Have Ann Winter come in from the kitchen to speak about nutrition and its importance with her job.
- Read Demon Dentist as the class book this half term.

Science: Year 3/4 Cycle A
Rocks and Soils 1: Grouping rocks and fossils (Autumn 2)

Key Vocabulary

Rock	A solid made up of lots of different minerals.
Stone	A piece of rock.
Pebble	A small, rounded stone made smooth.
Boulder	A large rock, one that has been made round with erosion.
Igneous	Solidified from lava or magma.
Sedimentary	Formed from sediment deposited by air or water.
Metamorphic	Rock that has changed due to heat, pressure or another natural cause.
Permeable	Allow liquids or gases to pass through.
Impermeable	Does not allow liquids or gases to pass through.
Fossilisation	The process in which a fossil is formed from the remains of a living thing.

Key facts

- Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone,
- slate etc. which have different properties.
- Rocks can be hard or soft. They have different sizes of grain or crystal.
- Rocks can be different shapes and sizes (stones, pebbles, boulders).
- Rocks may absorb water.
- The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil.
- Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.

Metacognition: First lesson must recap soils.

SC1: Scientific concepts (NC Statements).

- 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.

SC2: Scientific skills.

- Classify rocks in a range of ways, based on their appearance.
- Devise a fair test to investigate the hardness of a range of rocks.
- Devise a fair test to investigate how much water different rocks absorb.
- Observe how rocks change over time e.g. gravestones or old building.
- Present in different ways their understanding of how fossils are formed e.g. in role play, comic strip, chronological report etc.

SC3: Why don't you?

- Bread and gummy bear activity to recreate the formation of a fossil.

Science: Year 3/4 Cycle A
Electricity (Spring 1)

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
circuit	A pathway that electricity can flow around. It includes wires and a power supply and may include bulbs, switches or buzzers.
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. A collection of cells.
cell	A device that stores energy as a chemical until it is needed. A cell is a single unit.
wire	A thin light of metal covered in plastic which allows electricity to pass through.
Bulb/lamp	Provides light
switch	Changes the flow of an electrical circuit
buzzer	An electric signalling device that makes a sound.
conductor	A material or device which allows heat or electricity to carry through.
insulator	A material or device which does not allow heat or electricity to carry through.

Key facts

- 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.
- There are two types of electric current: mains electric, battery electric.
- Electricity can only flow around a complete circuit.
- Switches can be used to open and close the circuit.

SC1: Scientific concepts (NC Statements).

- 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.

SC2: Scientific skills.

- Draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6.
- Observe 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.

SC3: Why don't you?

- Look into renewable energy near Scunthorpe: Keadby 2 windfarm, Solar panels on houses next to school.

Science: Year 3/4 Cycle A
Living Things and their Habitats (Spring 2)

Key Vocabulary

Organisms	Another word that can be used for a 'living thing'.
Classification	Where plants and animals are placed into groups according to their similarities.
Habitat	The specific area or place in which particular animals and plants live.
Environment	This contains many habitats which contain areas where there are both living and non-living things.
Vertebrates	Animals with a backbone.
Invertebrates	Animals without a backbone.
Specimen	A particular plant or animal scientists study to find out about its species.
Species	A group of similar organisms. E.g. Dogs.
Life Processes	The things living things do to stay alive.
Endangered Species	A plant or animal where there are not many of the species left and scientists are concerned that they may become extinct.
Extinct	When a species has no more members alive on the planet.

Key facts

- 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.
- 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. Changes to an environment can be natural or caused by humans.
- Vertebrates can be separated into five broad groups: Mammals, Fish, Birds, Reptiles and Amphibians (children will learn more about these in Years5/6).
- You can use classification keys to help group, identify and name a variety of living things. Here is an example of a classification key.
- The vast majority of living things on the planet are invertebrates.

SC1: Scientific concepts (NC Statements).

- 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.

SC2: Scientific skills.

- Use and make simple guides or keys to explore and identify local plants and animals.
- Make 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.

SC3: Why don't you?

- Sort invertebrates you might see around school into a classification key.
- Use fieldwork to explore human impact on the local environment e.g. litter, tree planting.

Science: Year 3/4 Cycle A
States of matter (Summer 1)

Key Vocabulary

Solids	They keep their shape. They can be hard, soft or squashy.
Liquids	They take they shape of the container. They can change shape but do not change the amount of space they take up. They can flow and be poured.
Gases	They 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	When water 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 into 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 hail, sleet, rain or snow.

Key facts

- Pupils should 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.
- Melting is a state change from solid to liquid.
- Freezing is a state change from liquid to solid. The freezing point of water is 0oC.
- Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100oC.
- Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy.
- Condensation is the change back from a gas to a liquid caused by cooling.
- Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle.

SC1: Scientific concepts (NC Statements).

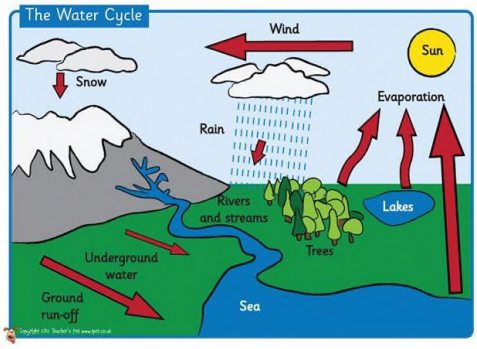
- Compare and group materials together, according to whether they are solids, liquids or gases.
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).
- Identify the part played by evaporation and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

SC2: Scientific skills.

- Classify materials according to whether they are solids, liquids or gases.
- Use a thermometer to measure temperatures (icy water, tap water, hot water, boiling water).
- Explore 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).
- Research, using secondary sources, to find out about the water cycle.

SC3: Why don't you?

- 3/4 could set up a Science Fair in the hall to showcase their knowledge to 5/6 (Hamilton trust have ideas).
- Have a thermometer in the classroom and have children read the daily temperature.



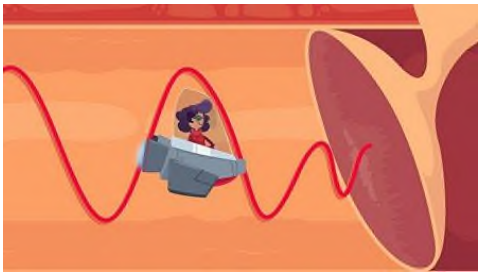
Science: Year 3/4 Cycle A
Sound (Summer 2)

Key Vocabulary

vibrations	A movement backwards and forwards.
sound waves	Vibrations travelling from a sound source.
Volume	The loudness of sound.
Amplitude	The size of the vibration. A larger amplitude = a larger sound.
Pitch	How low or high a sound is.

Key facts

- 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.
- A sound produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.
- The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source.
- A sound insulator is a material which blocks sound effectively.
- Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.



SC1: Scientific concepts (NC Statements).

- 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.

SC2: Scientific skills.

- Find patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses.
- Make earmuffs from a variety of different materials to investigate which provides the best insulation against sound.
- Investigate pitch with milk bottles and different levels of water.

SC3: Why don't you?

- Make and play their own instruments by using what they have found out about pitch and volume
- Discuss how hearing aids help people to hear sound.