Year group: 4 Topic: Electricity

What should I already know?

This is the first time the children will have covered electricity in detail.

What will I know by the end of the unit? (Substantive Knowledge)

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

Common misconceptions

Some children think that batteries have electricity inside them. They imagine electricity as a kind of fuel that flows into electrical appliances.

Children sometimes think that when there are two bulbs in the circuit, the electricity will reach one bulb first and this will be brighter than the second because the bulb uses up the electricity.

Key Vocabulary

Mains electricity	Material
Battery	Metal
Appliance	Graphite
Electric shock	Buzzer
Wire	Switch
Plug	Motor
Socket	Fan
Adapter	Brightness
Current	Burn out
Power	Dim
Power station	Alarm
Bulb	Trigger
Flow	Detect
Crocodile clip	Join
Link	Break
Conductor	Insulator

Working Scientifically (Disciplinary Knowledge)

Asking questions and using scientific enquiries to answer them about positive and negative terminals in batteries.

To set up a simple practical test and gather and record data about materials for conductivity.

Identify differences, similarities or changes related to simple scientific ideas and processes and to consolidate understanding of how circuits work

To plan an investigation into how the brightness of a bulb can be changed.

To identify changes related to simple ideas about batteries and bulbs and to support these ideas with scientific evidence from their experiments.

Year group: 4 Topic: States of Matter

What should I already know?

Pupils have studied the properties of materials in year 1 and 2 but have not looked at them as solids, liquids or gases.

What will I know by the end of the unit? (Substantive Knowledge)

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

Key Vocabulary

State	Evaporate
Solid	Condense
Liquid	Water vapour
Gas	Steam
Volume	Surface area
Fixed	Conclusion
Compressed	Evaluation
Change of state	Evidence
Melt	Precipitation
Freeze	

Common misconceptions

Children sometimes use the word solid to mean heavy, not flexible or in one big piece.

Children often confuse melting and dissolving.

Working Scientifically (Disciplinary Knowledge)

Ask relevant questions and use different types of scientific enquiries to answer them.

Set up simple practical enquiries, comparative and fair tests.

Record findings.

reporting on findings

Use results to draw simple conclusions, make predictions , suggest improvements and raise further questions

identifying differences, similarities or changes.

Year group: 4 Topic: Sound

Key Vocabulary	
Detect	Ear drum
Vibration	Ossicles
Sound wave	Cochlea
Volume	Auditory nerve
Amplified	Sound wave
Compression	Signal
Rarefaction	Muffle
Outer ear	Sensor
Middle ear	Conclusion
Inner ear	Analyse
Pinna	Evaluation
Auditory canal	Pitch
	Variable

What should I already know?

Children have not previously studied the science of sound.

What will I know by the end of the unit? (Substantive Knowledge)

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.

Common misconceptions

Children often have their own ideas about sound travelling, such as "tunes are very small and they can get through gaps in doors". Some children think there is something in the ear that actively catches the sound

Working Scientifically (Disciplinary Knowledge)

asking relevant questions and using different types of scientific enquiries to answer them
setting up simple practical enquiries, comparative and fair tests
making systematic and careful observations
recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
reporting on findings from enquiries using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
using straightforward scientific evidence to answer questions

Year group: 4 Topic: Living Things

What should I already know?

The names of invertebrate classes

What will I know by the end of the unit? (Substantive Knowledge)

Recognise that living things can be grouped in a variety of ways (plants: trees, grasses, flowers, ferns and mosses, vertebrates: fish, amphibians, reptiles, birds, and mammals. Invertebrates: snails and slugs, worms, spiders, and insects

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.

Common misconceptions

Children are not likely to have come across classification before and there are no commonly held misconceptions related to this topic.

Key Vocabulary

backbone	shell
amphibian	crustacean
gills	insect
lungs	arachnid
cold-blooded	thorax
class	abdomen
mammal	antennae
bird	plant
feathers	root
fur	stem
reptile	moss
scales	fern
eggs	conifer
suckle	cone
limbs	seed
fins	grass
warm-blooded	algae
Invertebrate	Spore
annelid	vertebrate
Mollusc	

Working Scientifically (Disciplinary Knowledge)

Asking relevant questions and using different types of scientific enquiries to answer them making systematic and careful observations

Recording findings using simple scientific language, keys, identifying differences, similarities or changes related to simple scientific ideas and processes.

Year group: 4 Topic: Animals including humans

What should I already know?

Pupils will have learned a little about healthy eating but will not have studied digestion in detail. They will have grouped animals and learned about the diet of different animals and have been introduced to the terms herbivore, carnivore and omnivore.

What will I know by the end of the unit? (Substantive Knowledge)

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.

Common misconceptions

Children sometimes think that food and drink travel through the body separately. They will draw different tubes through the neck.

Key Vocabulary

Teeth	Anus
Carnivore	Faeces
Herbivore	Digest
Omnivore	Absorb
Incisor	Waste
Canine	Bile
Molar	Chyme
Gum	Muscle
Saliva	Squeeze
Taste buds	Enzyme
Decay	Digest
Cavity	Absorb
Bacteria	Excrete
Acid	Producer
Chew	Consumer
Swallow	Prey
Stomach	Food chain
Oesophagus	
Intestine	

Working Scientifically (Disciplinary Knowledge)

Comparing teeth

Observing teeth

Asking questions about the different shapes of teeth

Recording findings on a table when testing taste buds

using straightforward scientific evidence to answer questions about keeping teeth clean

Create a model for different parts of the digestive system

recording findings using simple scientific language in a creative writing task about poo

identifying differences, similarities or changes related food chains