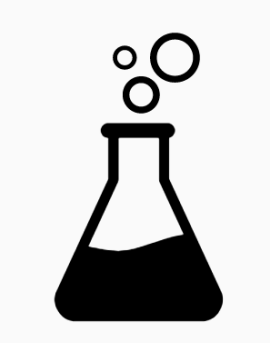
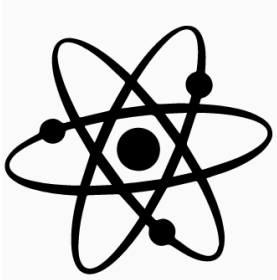
Science

at Perranporth School

Developed by Stuart Harris, with support of the staff at Perranporth Community Primary School, 2021





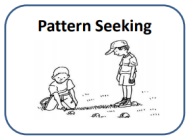
PERRANPORTH COMMUNITY PRIMARY SCHOOL

Science...making sense of the world we live in.

Science at Perranporth

Intent

Science is all around us in everyday life and is, therefore, used to excite pupils' curiosity about the phenomena and events that occur in the world around them. Science teaching at Perranporth also focuses on Working Scientifically using five key investigation types (see images below). This focal point of science has been developed to increase children's ability to make predictions about scientific concepts and evaluate and amend them through analysing and interpreting data collected independently, with adult modelling as a guide. This enables our pupils to question and discuss science-based issues that may affect their own lives and the future of the world too! Our curriculum is designed so that children can use science learning to '*make sense of the world we live in.*'



Implementation

Science is taught in combination with our Perranporth inspired curriculum projects, to ensure every child has access to the statutory requirements of the national curriculum. Where possible, Science is taught within and as part of our chosen projects, but if this is not feasible, teachers plan stand alone science lessons to ensure coverage of the expected objectives across the school. Science is taught weekly in each class with clear references made to the class topic when possible. The weekly sessions ensure the statutory coverage of science knowledge and skills for children across both key stages. In the Spring term, to coincide with Perranporth's Science Week, all classes complete Science inspired learning through science specific topics.

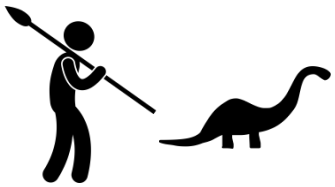
To further embed science learning for each child, each class participates in a whole school 'Working Scientifically' (WS), activity session at least once a term, to identify and assess children and moderate WS across key stages and the school as a whole. These activities are planned on a yearly timetable and address the three key areas of WS; *planning, doing and reviewing/concluding*. Evidence of these sessions can be found in the WS floor books in each Key Stage.

Impact

Focusing on a range of investigation types allows Perranporth children to develop excellent problem solving skills. These will be regularly referenced and supported through our termly, whole school WS investigation days and will also support our maths mastery teaching. Perranporth pupils will be knowledge rich and have an increasing ability to explain scientific concepts due to our core focus of scientific vocabulary and use of images to support their understanding. Furthermore, we believe our pupils will enjoy science learning and finding out about the world in which we live, ensuring they see science as not only an engaging lesson, but also as a potential future career.

Perranporth School recognises that the science curriculum is **vocabulary rich** and planned **exposure to** and **use of this vocabulary** impacts upon a child's scientific understanding and enjoyment. As a result, wherever possible, scientific vocabulary in our school is celebrated and **displayed clearly** with supportive **symbols or images**. Examples can be seen around school and are also shown below...

Push



Prehistoric

Absorbent

Waterproof

Perranporth School also ensures children have access to a range of investigation types so that they can investigate and work scientifically in the most efficient way. Our investigation types are broken down into five main types, as shown below, and are explained in more detail on the next few pages. Teachers signpost investigation types using an image from those posted below. Over the course of an academic year, children are exposed to a range of investigation types.

Observing over time

Pattern Seeking

Research Using Secondary Sources

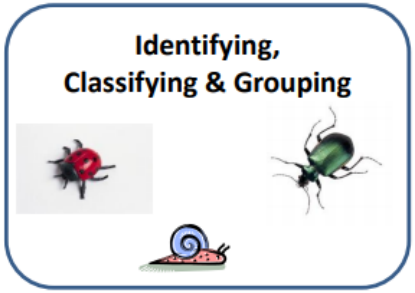
Identifying, Classifying & Grouping

Comparative & Fair Testing

Observing over time

Making careful observations of objects or events and how they change over time. Example questions shown below:

- How do habitats change during the year?
- What happens to ice when it is heated up?
- How does exercise affect our pulse rates?
- How do our shadows change during a day?
- How does the shape of the moon change during a month?
- What happens to a puddle on a hot day?
- How does mould grow on different foods?



Identifying features that allow things to be organised into distinct groups. Recognise things as part of a specific group and name them. Example questions shown below:

- Is it a living thing or not?
- Can we identify everyone in our class by their fingerprints?
- Can we use keys to identify plants and animals?
- Which materials can be recycled?
- Can we identify which objects will float and which will sink?
- Can you sort the toys by how they are powered?

Pattern Seeking

Observing and recording natural phenomena, carrying out surveys or collecting data from secondary sources. Then looking to identify patterns in the data. Example questions shown below:

- Do taller plants grow from bigger seeds?
- Do tall people have bigger feet?
- Are older children in our class taller?
- Do different insects live in different places?
- Which months are wettest?
- Do bigger musical instruments always make deeper sounds?
- Are all magnetic objects good electrical conductors?

Comparative & Fair Testing

Observing or measuring the effect of changing one variable whilst keeping other potential variables constant. Example questions shown below:

- Which material makes the best parachutes?
- Which surface provides the least friction?
- How does the temperature of water affect the rate at which sugar dissolves?
- Which paper towel soaks up most water?
- What does a plant need to grow?
- How can we make the light bulb brighter?

Research Using Secondary Sources

Gathering and analysing scientific findings to answer a question or to provide background information to help explain observed events. Research can also show how scientists' ideas have changed over time as new evidence has been found. Example questions found below:

- What do different animals eat?
- How do we digest our food?
- How does blood travel round our bodies?
- Why does the moon change every night?
- How does an aeroplane fly?
- Where does glass come from and when did we start using it?
- What will happen to Earth as the sun dies?

Science Rolling Action Plan and checklist

Month	Task 1	Task 2	Task 3
September	Resource check and update	Review T and L with staff — changes/updates needed?	
October	Book Look 1	Pupil conferencing 1	Check/update communal science display
November	Learning Walk/Flash visit		Prep for whole school WS check
December	Data check	Data check follow up	Run and evaluate whole school WS check
January	Book Look 2	Pupil Conferencing 2 (identified from data check)	Check/update communal science display
February	Science Week Prep	Learning Walk/Flash visit (identified from previous visits)	Prep for whole school WS check
March	Science Week activities	Resource check and update	Run and evaluate whole school WS check
April	Data check	Data check follow up	
May	Learning Walk/Flash visit (identified from previous visits)	Pupil conferencing 3 (identified from data check)	Check/update communal science display
June	Book Look 3		Prep for whole school WS check
July	Resource check and update	Data check and follow up	Run and evaluate whole school WS check

Working Scientifically Assessment and Moderation Check Schedule

	Autumn	Spring	Summer
	Planning	**Doing**	**Reviewing/Concluding**
CYCLE 1	Ice cube observation - children given ice cube - Possible ideas - What will happen to the ice? What material(s) will stop them melting quickest? Where will the ice last longest?	Sorting sweets/objects - using Liquorice Allsorts (KS1) and assigning habitat spaces (KS2), children to work out a way of sorting the sweets/ plants/insects - colour, size, shape, (taste!) - focus on how they sort, the language they use and how they present the information.	What material makes the best boat? Children given this question and junk model equipment with a range of materials that will/won't float. Focus on what they find out when testing their 'boats' and if they change their design/materials as a result. At UKS2, children asked to produce the fastest boat, or the boat that will take the most weight...
CYCLE 2	Balloon rocket. How high can yours fly? P:\SCIENCE\Working scientifically investigation ideas\WS idea - rocket investigation Science Fun at Home 13 Rocket Science.pdf	Paper aeroplane - design the plane that flies the longest/furthest (specify to KS1/LKS2) but allow UKS2 to develop their own investigation. How do they test? How do they know their results are valid?	Liquid viscosity investigation—we will need a variety of liquids… P:\SCIENCE\Working scientifically investigation ideas\WS investigation idea summer cycle 2 Science Fun at Home 15 Liquid Science.pdf
CYCLE 3	Sounds of science - P:\SCIENCE\Working scientifically investigation ideas\WS idea - sounds of science Science Fun at Home 12 Sounds of Science.pdf	Density of liquid/objects - float/sink - P:\SCIENCE\Working scientifically investigation ideas\WS float or sink - density Science Fun at Home 8 Water.pdf	Dissolve or not? P:\SCIENCE\Working scientifically investigation ideas\WS Dissolving - twinkl.pdf
CYCLE 4	Sycamore seed inspired investigation - P:\SCIENCE\Working scientifically investigation ideas\WS idea - sycamore seeds - 2. Spinning Science.pdf P:\SCIENCE\Working scientifically investigation ideas\WS idea - sycamore seeds - 2. Spinning Science - twinkl.pdf	Magnet Magic - P:\SCIENCE\Working scientifically investigation ideas\WS idea - Magnetic superhero twinkl.pdf	Save the Egg - P:\SCIENCE\Working scientifically investigation ideas\WS idea - Egg Drop Science Experiment - twinkl.pdf
CYCLE 5	Ewww, Mould! - P:\SCIENCE\Working scientifically investigation ideas\WS idea - Mould - mouldy-bread-experiment - twinkl.pdf	Keep me dry! P:\SCIENCE\Working scientifically investigation ideas\WS idea - waterproof shelters - Take It Outside Spring Stem Making A Waterproof Shelter Activity - twinkl.pdf	Chase the shadow - P:\SCIENCE\Working scientifically investigation ideas\WS idea - shadows - twinkl powerpoint.pptx
CYCLE 6	Which way, wind? P:\SCIENCE\Working scientifically investigation ideas\WS idea - planning - weather vanes - which direction is the wind and what affect does that have - temp, rain, etc....pdf	What materials make the best insulators and why?	How far can you sling it? P:\SCIENCE\Working scientifically investigation ideas\WS idea - catapults - need lolly sticks, elastic bands, spoons....pdf

The following pages identify the year group specific objectives and topic areas taught at Perranporth School in Key Stage 1 and 2. Working scientifically objectives and expected vocabulary progression are also shown in this section.

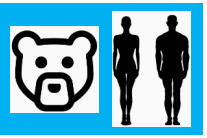
EYFS 'science' learning is identified separately in their UTW Planning, using the Ogden Trust Toolkit - Perranporth recognises the vital, practical platform this year gives our children in their knowledge and understanding of the world we live in.

For detailed, specific topic coverage and planning, please see our separate Science Schemes of Work for each year group.

KEY STAGE 1

Year 1

Animals, including humans



(Part one)

- identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.
- identify and name a variety of common animals that are carnivores, herbivores and omnivores.

⇒ Identifying and classifying

⇒ Using their observations and ideas to suggest answers to questions.

Everyday Materials

(Part one)

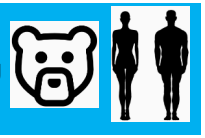
- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials on the basis of their simple physical properties

⇒ Identifying and classifying

⇒ Perform simple tests

⇒ Gather and record data to answer questions.

Animals, including humans



(Part two)

- describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)
- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

⇒ Identifying and classifying

⇒ Using their observations and ideas to suggest answers to questions.

Plants

- identify and name a variety of common wild and garden plants, including deciduous and evergreen trees
- identify and describe the basic structure of a variety of common flowering plants, including trees.

⇒ Observing closely, using simple equipment

⇒ Perform simple tests

⇒ Gather and record data ...

Seasonal Changes

Covered termly through the year.

- observe changes across the four seasons.
- observe and describe weather associated with the seasons and how day length varies.

⇒ Asking simple questions, knowing they can be answered in different ways.

⇒ Gather and record data to help answer questions.

Everyday Materials

(Part two)

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials on the basis of their simple physical properties

⇒ Identifying and classifying

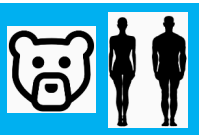
⇒ Perform simple tests

⇒ Gather and record data to answer questions.

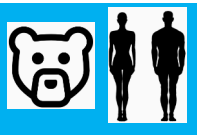
KEY STAGE 1

Year 1

WS TARGET TRACKER CHECKLIST

Animals, including humans 

Everyday Materials 

Animals, including humans 

Plants 

Everyday Materials 

	T1	T2	T3	T4	T5	T6
• Ask simple questions and recognise that they can be answered in different ways						
• Use simple equipment to observe closely						
• Perform simple tests						
• Identify and classify						
• Use observations and ideas to suggest answers to questions						
• Gather and record data to help in answering questions						

Seasonal Changes 

Covered termly through the year.

•observe changes across the four seasons.

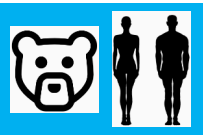
•observe and describe weather associated with the seasons and how day length varies.

KEY STAGE 1

Year 1

Scientific Vocabulary

Animals, including humans



Common animals

Fish Amphibians Reptiles Birds

Mammals
Pets

Diet

Carnivores: Meat Cat Dog Lion Tiger Shark Killer Whale Eagle Hawk Snake Tyrannosaurus Rex

Herbivores: Plants Cow Horse Mice Elephant Deer

Everyday Materials

Material

Wood plastic

Glass metal

Water rock

Brick paper

Fabrics elastic

Foil

Properties

Hard soft see-through (transparent)

Stretchy stiff

Shiny dull

Rough smooth

Bendy

Not bendy

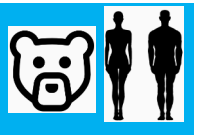
Waterproof

Not waterproof

Absorbent

Not absorbent

Animals, including humans



Compare

Head Leg
Eyes Neck
Knees Hair
Arms Face
Mouth Elbows
Ears Teeth

Senses

Tongue taste
Nose smell
Eyes vision
Skin touch
Ears hearing

Plants

Common
Wild plants
Garden plants
Deciduous
Evergreen

Tree
Deciduous
Evergreen
Trunk
Branches
Leaf
Root

Plant
Leaf leaves
Root bud
Flowers blossom
Petals root
Stem

Everyday Materials

Material

Wood plastic

Glass metal

Water rock

Brick paper

Fabrics elastic

Foil

Properties

Hard soft see-through (transparent)

Stretchy stiff

Shiny dull

Rough smooth

Bendy

Not bendy

Waterproof

Not waterproof

Absorbent

Not absorbent

Seasonal Changes

Covered termly through the year.

Season

Autumn Winter Spring Summer Day Daytime Night Night-time

Weather

Wind rain snow hail Sleet fog Sun hot Warm cold

KEY STAGE 1 Year 2

Everyday uses of materials	Everyday uses of materials	Living things and their habitats	Living things and their habitats	Plants	Animals, including humans
FULL TERM TOPIC		(Part One)	(Part two)		
• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	• explore and compare the differences between things that are living, dead, and things that have never been alive. • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other .	• identify and name a variety of plants and animals in their habitats, including micro-habitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.	• observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	• notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.
⇒ **Identifying and classifying** ⇒ **Using their observations and ideas to suggest answers to questions.** ⇒ **Perform simple tests**	⇒ **Identify and classify** ⇒ **Using their observations and ideas to suggest answers to questions.** ⇒ **Perform simple tests**	⇒ **Identify and classify** ⇒ **Ask simple questions, recognising they can be answered in different ways** ⇒ **Gather and record data to answer questions**	⇒ **Identify and classify** ⇒ **Ask simple questions, recognising they can be answered in different ways** ⇒ **Gather and record data to answer questions**	⇒ **Perform simple tests** ⇒ **Observe closely, using simple equipment.** ⇒ **Gather and record data to answer questions**	⇒ **Ask simple questions, recognising they can be answered in different ways** ⇒ **Gather and record data to answer questions** ⇒ **Perform simple tests**

KEY STAGE 1 Year 2

WS TARGET TRACKER CHECKLIST

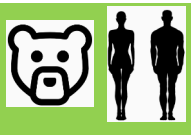
Everyday uses of materials 

Everyday uses of materials 

Living things and their habitats 

Living things and their habitats 

Plants 

Animals, including humans 

FULL TERM TOPIC

	T1	T2	T3	T4	T5	T6
• Ask simple questions and recognise that they can be answered in different ways, including use of scientific language from the NC						
• Use simple equipment to observe closely, including changes over time						
• Communicate ideas and what he/she does and finds out in a variety of ways						
• Perform simple comparative tests						
• Identify, group and classify						
• Use observations and ideas to suggest answers to questions, noticing similarities, differences and patterns						
• Gather and record data to help in answering questions, including from secondary sources of information						

KEY STAGE 1 Year 2

Scientific Vocabulary

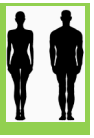
Everyday uses of materials 

Everyday uses of materials 

Living things and their habitats 

Living things and their habitats 

Plants 

Animals, including humans  

FULL TERM TOPIC

Materials

Wood metal plastic
Glass brick rock
Paper cardboard

Wood

Matches floors
telegraph poles tables chairs

Metal

Coins cans cars table legs
Knives forks spoons

Plastic

Spoons packaging single use
Recycling waste

John Dunlop Rubber
Charles Macintosh Waterproof fabric
John McAdam macadamisation

Part one Part two

Living Dead Never alive
Habitats Micro-habitats logs
Food Food chain
Sun Water air
Grass
Cow Human
Alive Healthy

Shelter Leaf litter Stony path
Under bushes Logs Seashore
Ocean Woodland Rainforest

Conditions

Hot warm cold
Dry damp wet
Bright shade
Dark

Common
Wild plants
Garden plants
Deciduous
Evergreen

Tree
Deciduous
Evergreen
Trunk
Branches
Leaf
Root

Plant
Leaf leaves
Root bud
Flowers blossom
Petals root
Stem

Fruit
Vegetables
Bulb
Seed

Suitable Conditions
Water
Light
Temperature
Healthy
Grow
Germinate
Reproduce

Survival

Water food
Air exercise
Hygiene

Offspring
Growth
Adults

Nutrition
Reproduce

Lifecycles

Egg chick chicken
Egg caterpillar
Pupa butterfly
Spaw tadpole
Frog
Lamb sheep
Baby toddler
Child teenager
Adult

LOWER KEY STAGE 2 Year 3

Forces and magnets

- compare how things move on different surfaces
- observe how magnets attract or repel each other and attract some materials and not others.
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- Notice that some forces need contact between two objects but magnetic forces can act at a distance
- Predict whether two magnets will attract or repel each other, depending on which poles are facing.

⇒ **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 and where appropriate, taking accurate measurements using standard units, using a range of equipment**

⇒ **gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**

⇒ **reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions**

⇒ **Using straightforward scientific evidence to answer questions or to support their findings**

⇒ **using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Rocks

- 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.

⇒ **gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**

⇒ **recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables**

Animals, including humans

FULL TERM TOPIC

- 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
- identify that humans and some other animals have skeletons and muscles for support, protection and movement.
- 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
- identify that humans and some other animals have skeletons and muscles for support, protection and movement.

⇒ **gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**

⇒ **recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables**

⇒ **identifying differences, similarities or changes related to simple scientific ideas and processes**

Light

- recognise that they need light in order to see things and that dark is the absence of light
- notice that light is reflected from surfaces
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- recognise that shadows are formed when the light from a light source is blocked by a solid object
- find patterns in the way that the size of shadows change

⇒ **asking relevant questions and using different types of scientific enquiries to answer them**

⇒ **setting up simple practical enquiries, comparative and fair tests**

⇒ **Using straightforward scientific evidence to answer questions or to support their findings**

Plants

- 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.

⇒ **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 and where appropriate, taking accurate measurements using standard units, using a range of equipment**

⇒ **gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**

⇒ **reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions**

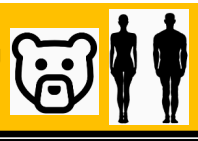
⇒ **Using straightforward scientific evidence to answer questions or to support their findings**

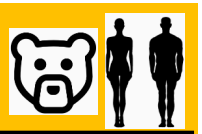
LOWER KEY STAGE 2 Year 3

WS TARGET TRACKER CHECKLIST

Forces and magnets 

Rocks 

Animals, including humans 

Animals, including humans 

Light 

Plants 

FULL TERM TOPIC

	T1	T2	T3	T4	T5	T6
• Ask relevant questions and use different types of investigation to answer them						
• Gather, record, classify and present data in a variety of ways to help in answering questions						
• Set up simple practical enquiries, comparative and fair tests						
• Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables						
• Report on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions						
• Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions						
• Identify differences, similarities or changes related to simple scientific ideas and processes						
• Use straightforward scientific evidence to answer questions or support findings						

LOWER KEY STAGE 2 Year 3

Scientific Vocabulary

Forces and magnets

Force
Push pull
Repel
Magnet
Attract repel
Magnetic
Poles
North South
Opposites
Surface(s)
Air Resistance
Gravity
Friction
Metal
Non-metal

Rocks

Appearance
Properties
Grains crystals

Hard soft
Shiny dull
Rough smooth
Absorbent non absorbent

Rock
Soils
Organic matter
Fossils
Sedimentary
Human Made
Natural
Igneous
Metamorphic

Animals, including humans

Animals, including humans

FULL TERM TOPIC

Nutrition

Nutrients carbohydrates Protein fats
fibre water Vitamins minerals

Skeleton

Support protection movement
Endoskeleton exoskeleton
Hydrostatic skeleton
Vertebrate invertebrate bones

Joints

Ball joint socket joint hinge joint
Gliding joint

Muscles

relax contract pairs

Light

Light See
Blocked Dark
Reflect
Surface(s)

Natural
Star
Sun

Artificial
Torch
Candle
Lamp

Shadow block

Sunlight
Dangerous
Protect eyes

Plants

Common
Wild plants
Garden plants
Deciduous
Evergreen

Tree
Deciduous
Evergreen
Trunk
Branches
Leaf
Root

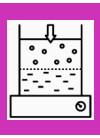
Plant
Leaf leaves
Root bud
Flowers blossom
Petals root
Stem

Fruit
Vegetables
Bulb
Seed

Suitable Conditions
Water
Light
Temperature
Healthy
Grow
Germinate
Reproduce

LOWER KEY STAGE 2 Year 4

States of matter



- 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

⇒ **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 and where appropriate, taking accurate measurements using standard units, using a range of equipment**

⇒ **gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**

⇒ **reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions**

⇒ **Using straightforward scientific evidence to answer questions or to support their findings**

⇒ **using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Electricity

- 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

⇒ **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 and where appropriate, taking accurate measurements using standard units, using a range of equipment**

⇒ **gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**

⇒ **reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions**

⇒ **Using straightforward scientific evidence to answer questions or to support their findings**

⇒ **using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Animals, including humans

- 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

⇒ **asking relevant questions and using different types of scientific enquiries to answer them**

⇒ **gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**

⇒ **recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables**

Sound

Sound

FULL TERM TOPIC

- 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.

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⇒ **Using straightforward scientific evidence to answer questions or to support their findings**

⇒ **using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Living things and their habitats

- 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.

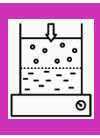
⇒ **asking relevant questions and using different types of scientific enquiries to answer them**

⇒ **gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**

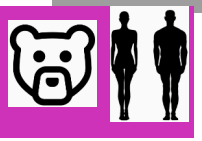
⇒ **recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables**

LOWER KEY STAGE 2 Year 4

WS TARGET TRACKER CHECKLIST

States of matter 

Electricity 

Animals, including humans 

Sound 

Sound 

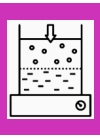
Living things and their habitats 

	T1	T2	T3	T4	T5	T6
• Ask relevant questions and use different types of investigation to answer them						
• Gather, record, classify and present data in a variety of ways to help in answering questions						
• Set up simple practical enquiries, comparative and fair tests						
• Make systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment						
• Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables						
• Report on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions						
• Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions						
• Identify differences, similarities or changes related to simple scientific ideas and processes						
• Use straightforward scientific evidence to answer questions or support findings						

LOWER KEY STAGE 2 Year 4

Scientific Vocabulary

States of matter



States

Solid liquid

Gas

Processes

Melt freeze

Evaporate

Condense

Heat heated

Cool cooled

Evaporation

Condensation

Melting

Warm cool

Solidify

Water Cycle

Changing state

Container (shape)

Thermometer

Degrees Celsius (°C)

Measurement

Electricity

Appliances

Mains powered

Battery powered

Electricity

Electrical circuit

Electrical safety

Danger

Signs

Components

Cell

Wire

Bulb

Buzzer

Switches

Open closed

Insulators

Wood rubber

Plastic glass

Conductors

Metal Water

Animals, including humans

Human Digestive System

Digestion mouth

Tongue - mixes moistens

Saliva

Oesophagus transports

Stomach acid

Enzymes

Small intestine absorbs water

Vitamins

Large intestine compacts

Colon

Teeth

Incisors cutting slicing

Canines ripping tearing

Molars grinding chewing

Floss brush

Food Chain

Sun

Primary secondary

Producers decomposer

Consumers tertiary

Prey

Predators

Carnivore

Herbivore

Omnivore

Sound

Sound

FULL TERM TOPIC

Vibrate vibration vibrating

Air (or other medium)

Travel distance volume pitch

Ear hear sound

Insulate conduct

Faint fainter loud louder

Instruments

String percussion woodwind

Brass

Living things and their habitats

Environment

Flowering

Non-flowering

Plants

Animals

Environment

Dangers!

Vertebrates

Fish amphibians

Reptiles birds

Mammals (humans)

Invertebrates

Snails slugs worms

Spiders insects

Plants

Flowering plants (including grasses)

Non-flowering plants (including mosses and ferns)

Human Impact

Positive

Nature reserves

Ecological planning

Wild gardens and garden ponds

Negative

Population development

Litter deforestation

Single use plastics

Throw away culture

UPPER KEY STAGE 2

Year 5

Properties and changes of materials

(Part one)

- 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
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating

⇒ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

⇒ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate

⇒ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

⇒ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

⇒ using test results to make predictions to set up further comparative and fair tests.

Properties and changes of materials

(Part two)

- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- 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.

Earth and Space

- describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- describe the movement of the Moon relative to the Earth
- describe the Sun, Earth and Moon as approximately spherical bodies

⇒ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

⇒ identifying scientific evidence that has been used to support or refute ideas or arguments

Living things and their habitats

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- describe the life process of reproduction in some plants and animals

⇒ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

⇒ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Forces

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

⇒ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

⇒ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate

⇒ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

⇒ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

⇒ using test results to make predictions to set up further comparative and fair tests.

Animals, including humans

- describe the changes as humans develop to old age

⇒ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

UPPER KEY STAGE 2

Year 5

WS TARGET TRACKER CHECKLIST

Properties and changes of materials 

Properties and changes of materials 

Earth and Space 

Living things and their habitats 

Forces 

Animals, including humans  

	T1	T2	T3	T4	T5	T6
• Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary						
• Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate						
• Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs						
• Use test results to make predictions to set up further comparative and fair tests						
• Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms, such as displays and other presentations.						
• Identify scientific evidence that has been used to support or refute ideas or arguments						

UPPER KEY STAGE 2

Year 5

Scientific Vocabulary

Properties and changes of materials

Part one

properties
hardness
solubility
transparency
electrical conductor
thermal conductor
response to magnets
dissolve
solution
separate
separating
solids
liquids
gases
evaporating
reversible changes
dissolving
mixing
evaporation
filtering
sieving
melting
irreversible
new material
burning
rusting
magnetism
electricity
chemists
Spencer Silver
Ruth Benerito
quantitative
measurements
conductivity
insulation
chemical

Properties and changes of materials

Part two

Earth and Space

Earth
Sun
Moon
Moons
Planets
Stars
Solar System
Mercury
Venus
Mars
Jupiter
Saturn
Uranus
Neptune
Pluto*

Rotate
Spin
Orbit
Axis
Tilt
spherical
Heliocentric
Geocentric
Day
Night
Hemisphere
Season

Aristotle
Ptolemy
Galileo
Copernicus
Brahe
Alhazen

Living things and their habitats

life cycles
mammal
amphibian
insect
bird

life process of reproduction
plants
animals
vegetable garden
flower border

animal naturalists
David Attenborough

animal behaviourist
Jane Goodall

reproduction
plants: sexual, asexual
animals: sexual

lifecycles around the world
rainforest
oceans
desert
prehistoric
similarities
differences

Forces

Gravity
Air resistance
Water resistance
Friction
Surface force
Effect move
Accelerate
Decelerate stop
Change direction
Brake
Mechanism
Pulley
Gear
Spring
Theory of gravitation
Galileo Galilei
Isaac Newton

Animals, including humans

puberty
life cycle
gestation
growth
reproduce
foetus
baby
fertilisation
toddler
child
teenager
adult
old age
life expectancy
adolescence
adulthood
early adulthood
middle adulthood
late adulthood
childhood

UPPER KEY STAGE 2

Year 6

Electricity

- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.
- Use recognised symbols in a circuit diagram

⇒ **planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary**

⇒ **taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate**

⇒ **recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**

⇒ **reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**

⇒ **using test results to make predictions to set up further comparative and fair tests.**

Evolution and inheritance

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

⇒ **recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**

⇒ **identifying scientific evidence that has been used to support or refute ideas or arguments**

Animals, including humans

- identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- describe the ways in which nutrients and water are transported within animals, including humans

⇒ **reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**

⇒ **identifying scientific evidence that has been used to support or refute ideas or arguments**

Light

- recognise that light appears to travel in straight lines
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

⇒ **planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary**

⇒ **taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate**

⇒ **recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**

⇒ **reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**

⇒ **using test results to make predictions to set up further comparative and fair tests.**

Living things and their habitats

- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
- give reasons for classifying plants and animals based on specific characteristics

⇒ **recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**

⇒ **identifying scientific evidence that has been used to support or refute ideas or arguments**

Transition projects

-

⇒

UPPER KEY STAGE 2

Year 6

WS TARGET TRACKER CHECKLIST

Electricity	Evolution and inheritance	Animals, including humans	Light	Living things and their habitats	Transition projects
					

	T1
• Plan different types of scientific enquiries to answer their own and others' questions, including recognising and controlling variables where necessary	
• Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	
• Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	
• Use test results to make predictions to set up further comparative and fair tests	
• Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms, such as displays and other presentations.	
• Identify scientific evidence that has been used to support or refute ideas or arguments	
• Describe and evaluate their own and others' scientific ideas related to NC topics (including those that have changed over time), using evidence from a range of sources	
• Group and classify things and recognise patterns	
• Find things out using a wide range of secondary sources	
• Use appropriate scientific language and ideas from the NC to explain, evaluate and communicate methods and findings	

UPPER KEY STAGE 2

Year 6

Scientific Vocabulary

Electricity 

voltage
brightness
volume
switches
danger
series circuit
working safely with electricity
electrical safety sign
circuit diagram

recognised symbols

Components

switch
bulb
buzzer
motor

Problem solve

Electrical insulator

Electrical conductor

Evolution and inheritance 

evolution
adaption
inherited traits
adaptive traits
natural selection
inheritance
Charles Darwin
Alfred Wallace
DNA
genes
variation
parent
offspring
fossil
environment
habitat
fossilisation
plants
animals
living things

Animals, including humans 

internal organs
heart
lungs
liver
kidney
brain
skeletal
skeleton
muscle
muscular
digest
digestion
digestive
circulatory system
heart
blood vessels
blood
impact
diet
exercise
drugs
lifestyle
nutrients
water
damage
drugs
alcohol
substances

Light 

light
travels
straight
reflect
reflection
Refract
Refraction
light source
object
shadows
mirrors
periscope
rainbow
filters

Living things and their habitats 

classify
compare
Linnaean
Carl Linnaeus
classification
domain
kingdom
phylum
class
order
family
genus
species
characteristics
vertebrates
invertebrates
microorganisms
organism
flowering
non-flowering

Transition projects 

Science Assessment

Teachers at Perranporth use the whole school, termly Working Scientifically (WS) investigations as a base judgement of their children's WS attainment, alongside in-class investigations.

Teachers also use the whole school assessment system, Target Tracker, to identify those children Working Below, Working At, Working Above and with Mastery of Age Expected Expectations.

Useful websites

https://www.stem.org.uk/primary-science

https://explorify.wellcome.ac.uk/en/activities

https://pstt.org.uk/resources

https://edu.rsc.org/resources/curriculum-support/primary-curriculum-topics

https://www.ogdentrust.com/resources-cpd/resources

BBC Bitesize:

https://www.bbc.co.uk/bitesize/subjects/z6svr82

https://www.bbc.co.uk/bitesize/subjects/z2pfb9q

https://www.nexus-education.com/find-help-support-primary-science/

https://www.pzaz.online/