SCIENCE AT AYLWARD

Knowledge and Skills Progression

Click on each tab to find the relevent information

Intent, Implementation and Impact

Curriculum map

Knowledge and Skills Progression by Year Group

Useful websites and links

Intent, Implementation and Impact

Intent

At Aylward, we aim to enrich the lives of our pupils by teaching the Science National Curriculum in an informative and practical way.

We aim to teach key working scientifically skills, knowledge, and unit specific vocabulary to raise our pupil's aspirations and love and enjoyment of Science.

We believe that Science is important as it forms the basis of the world that we live in today.

Implementation

Our whole curriculum is shaped by our school vision, which aims to enable all children, regardless of background, ability, additional needs, to flourish to become the very best scientists and have the best scientific approach they can be.

We teach the National Curriculum which is supported by a clear, sequential progression of scientific based skills and knowledge, building upon prior learning. We also have a dedicated unit of teaching developing Science Capital and working scientifically skills.

During the year, all children will have the opportunity to access and be involved with a range of activities, both in school, the classroom, and externally in form of trips and workshops, linking with their Science work, in addition to a dedicated Science Investigation Day during the year. We have worked hard on raising the profile of Science at Aylward and we take pride in pupils developing their love of Science.

Impact

By the time children leave Aylward, they will:

· Be aware of a range of different professions within the Science field;

· Be able to work scientifically and have a scientific approach to their work;

· Be able to discuss their Science learning with reference and association to Science enrichment in form of trips and workshops;

· Exhibit a love of learning by raising their own questions and hypotheses, leading to pupils leading their own investigations and developing their own knowledge and skills at home.

Curriculum map

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	Seasonal changes - Autumn	Seasonal changes - Winter	Life in the ocean	Seasonal changes – Spring Bears	Farm Animals	Seasonal changes – Summer Minibeasts
Reception	My Body	Seasonal Changes	Materials Space	Animals Healthy Eating	Plants	Dinosaurs
Year 1	Seasons – Autumn The Human Body and Healthy Eating	Seasons – Winter Everyday Materials	Animal including humans	Seasons – Spring Working Scientifically skills	Plants	Seasons – Summer
Year 2	Animals including humans	Everyday materials	Living Things and their habitats	Weather	Working Scientifically skills	Plants
Year 3	Forces and Magnets	Light	Animals including humans	Working scientifically skills	Plants	Rocks
Year 4	Animals including Humans	Sound	States of Matter	Living Things and their Habitats	Electricity	Working Scientifically skills
Year 5	Forces and Motion	Earth and Space	Properties and changes of materials	Working Scientifically skills	Living Things and their Habitats	Animals including humans
Year 6	Light	Electricity	Evolution and Inheritance	Living things and their Habitats	KS2 SATs Working scientifically skills	Circulatory System

Knowledge and Skills Progression by Year Group

Click on each year group to see which units are covered in each term.

Nursery

Reception

Year 1

Year 2

Year 3

Year 4

Year 5

Year 6

Nursery





Clicking on a unit will take you to the knowledge and skills document which explains the unit in more detail.

Autumn 1	Autumn 2	Spring 1
Season - Autumn	Season - Winter	Life in the Ocean
Spring 2	**Summer 1**	**Summer 2**
Season - Spring Bears	Farm Animals	Seasons - Summer Minibeasts

Nursery Autumn – Seasonal changes

Prior learning

Autumn 1 - Autumn

Knowledge :

- To know there are different seasons.
- To know how the weather changes in Autumn.
- To know that seasons can affect what we see outside
- To know that my clothes may change to suit the weather or season

Skills:

- To explore the environment around them.
- To begin to describe what they see, hear and feel outside.
- To notice signs of seasonal changes around them.

Autumn 2 – Winter

Knowledge :

- To know there are different seasons.
- To know how the weather changes in Winter.
- To know that seasons can affect what we see outside
- To know that my clothes may change to suit the weather or season

Skills:

- To explore the environment around them.
- To begin to describe what they see, hear and feel outside.
- To notice signs of seasonal changes around them.

Key Vocabulary

seasons, autumn, winter, spring, summer, leaves, change, weather, cold, warm, rain, sun, wind

Tips and tricks

Suggestions for Implementation

Natural objects tuff tray (pine cones, sticks, leaves, petals)

Autumn/Winter senses walk around the school

Pictures of different seasons to explore similarities and differences

Leaf rubbings

Enrichment opportunities

Leaf rubbings
Collect conkers
Jump in puddles
Bring in clothing appropriate for Autumn or Winter

Suggested questions to measure impact:

What are the names of the seasons?
How do the trees change in Autumn?
What weather do you see in Winter?
What clothes do you wear in Winter/Autumn?

Nursery Spring – Life in the ocean, Bears & Spring

Prior learning

Spring 1 – Life in the Ocean

Knowledge :

- To know the ocean is a big place with lots of water
- To know the name of some ocean creatures
- To name features of ocean creatures
- To know that the ocean and it's animals need to be looked after
- To know about water safety

Skills:

- To identify and name some common ocean animals
- To describe simple features of sea creatures

Spring 2 – Bears & Spring

Knowledge :

- To know that some animals are called 'wild animals'
- To know there are different types of bears and where they live
- To know what bears eat and what they need to survive
- To know that some bears hibernate
- To know that wild animals can be dangerous
- To know that baby animals are born in spring
- To know that trees grow new leaves and flowers in spring

Skills:

- To identify and name types of bears and other wild animals
- To notice signs of seasonal changes around them.

Key Vocabulary

sea, ocean, dolphin, shark, turtle, fish, octopus, whale, crab, beach, water, sand, rockpool, shell, seaweed, fin, tentacles, scales,

Big, medium, small, large, bear, brown bear, polar bear, cub, paw, teeth, fur, hibernate, claws, blackbear, cave, wild, zoo, forest, mountain, river, cold, icy

Spring, Summer, Autumn, Winter, weather, change, cold, warm, sun, rain, wind, grow, flower, blossom,

Tips and tricks

Suggestions for Enhanced Provision

Investigate shells, seaweed, pebbles etc. with magnifying glasses
Rock pool exploration
Water investigation station
Flower painting
Animal and plant life cycles
Matching baby animals to their adult animal

Enrichment opportunities

Ocean role play outside –cover the ground in blue fabric
Make our own porridge and eat it
Spring walk – looking for signs of spring with binoculars

Suggested questions to measure impact:

What is the name of X creature?
What features does X creature have to help it live in the ocean?
How can you be safe near the ocean?
How do the trees change in Spring?
What weather do you see in Spring?

Nursery Summer – Farm animals & Mini beasts

Prior learning

Summer 1 – Farm Animals

Knowledge :

- To know the names of different farm animals
- To know that some of our food comes from farms (milk, eggs, vegetables)
- To know that there are different types of animals in different countries

Skills:

- To make comparisons between farm animals and wild animals.
- To describe the world around us by observing animals and plants

Summer 2 – Summer & Minibeasts

Knowledge :

- To names some minibeasts
- To know that minibeasts are living things
- To know where different minibeasts live
- To know what minibeasts eat
- To know how minibeast change as they grow
- To know how the weather changes in Summer.
- To know that my clothes may change to suit the weather or season

Skills:

- To observe mini-beasts and look for them in their habitats
- To notice changes in mini-beasts as they grow (life cycles).

Key Vocabulary

similarities, differences, home, animals, grow, growth, farm, food, life cycle, egg, milk, crops, farmer, cow, pig, duck, horse, goat, sheep, chicken, donkey, barn, tractor

similarities, differences, changes, lifecycle, mini-beast, insect, bug, leg, wing, body, antennae, shell, web, head, crawl, fly, buzz, slither, spin, hop, spider, ladybird, fly, bee, ,ant, worm, snail, slug, caterpillar, butterfly, worm

Tips and tricks

Suggestions for Implementation

Farm small world
Planting vegetables/crops -create our own farm
Mini-beast loose parts/small world
Playdough mini-beasts
Matching, sorting and comparing mini-beasts
Sequencing life cycles

Enrichment opportunities

Ark Farm visit
Wild Fangs workshop
Mini-beast hunt
Create a bug hotel

Suggested questions to measure impact:

What animals live on a farm?
What animal gives us X produce?
How is X farm animal different to X wild animal?
What is the name of X minibeast?
How does X minibeast change as it grows?

Reception





Clicking on a unit will take you to the knowledge and skills document which explains the unit in more detail.

Autumn 1	Autumn 2	Spring 1
My Body	Seasonal Changes	Materials Space
Spring 2	**Summer 1**	**Summer 2**
Animals Healthy Eating	Plants	Dinosaurs Summer

Reception Autumn – My body & Seasons

Prior learning

Recap Nursery learning: To know the names of the seasons and that seasons affect what we can see outside.
To know how the weather changes in Autumn. To know that my clothes may change to suit the weather or season.

Autumn 1 - My body

Knowledge :

- To know the names of key body parts.
- To know that humans change and grow

Skills:

- To explain how they have changed since they were a baby.

Autumn 2 – Seasonal changes

Knowledge :

- To know there are different seasons.
- To know how trees change in Autumn.
- To know how the weather changes in Autumn.
- To know how animals respond to seasonal changes.

Skills:

- To identify observable changes in the environment
- To describe the environment using their senses; hear, feel, see, smell
- To understand some changes can be reversible (freezing, melting) and some irreversible

Key Vocabulary

seasons, autumn, winter, spring, summer, leaves, change, weather

baby, child, teenager, adult

arms, legs, face, eyes, body, nose, head, mouth, ears, fingers, toes, chest, neck, elbow, knee, shoulders

Tips and tricks

Suggestions for Implementation

Natural objects tuff tray (pine cones, sticks, leaves, petals)

Autumn senses walk around the school

Pictures of different seasons to explore similarities and differences

Enrichment opportunities

Bring in baby pictures
Leaf rubbings Collect conkers
Jump in puddles
Bring in clothing appropriate for autumn
Art with leaves & sticks

Suggested questions to measure impact:

What is X body part called?
What body part would you use to ___?
How have you changed since you were a baby?
What season is the picture showing? How do you know?
How do the trees change in Autumn?

Reception Spring – Materials, Space, Animals & Healthy Eating

Prior learning

Recap Nursery learning: To know the names of different animals. To know which animals live on a farm. To know that some animals are called ‘wild animals’. To know that baby animals are born in spring
.

Spring 1 - Materials & Space

Knowledge :

- To know that we live in Earth
- To know the names of the planets in our solar system
- To name and identify a range of different materials and to know how they are used in familiar environments
- To understand recycling means using something again in a new way.
- To understand that littering can harm people and animals on Earth

Skills:

- Talking about the life cycle of plants and animals and what they need to survive.
- Exploring a range of habitats, looking at why the animal lives like that.
- To compare dinosaurs to animals now

Spring 2 – Animals & Healthy Eating

Knowledge :

- To know that animals follow a life cycle in which they grow and change over time.
- To name some baby animals.
- To know that some animals are nocturnal and some are diurnal.
- To know that some foods are unhealthy.
- To know the names of common fruits and vegetables
- To know the food we eat can affect our oral hygiene

Skills:

- To be able to differentiate between nocturnal and diurnal animals.
- To make observations of animals.
- To identify and sort healthy/unhealthy foods.
- To identify and group a range of fruits and vegetables.

Key Vocabulary

planet, Earth, sun, moon, day, night, solar system, astronaut, rocket, stars

material, plastic, glass, paper, cardboard, clothes, rubbish, litter, recycle

similarities, differences, environment, animals, pets, nocturnal, grow, growth, farm, food, life cycle, ocean, chick, lamb, calf

healthy, unhealthy, fruit, vegetable, meat, humans, animals, grow, farm, plants, food, teeth, body

Tips and tricks

Suggestions for Implementation

'Save the oceans' tuff tray
Sorting, organising and labelling materials
Collage with a range of materials
Write labels and signs for recycling bins
Loose part play – creating animal habitats
Farm/vet role play areas
Sorting activities, matching animals to a home = pets, farm, wild etc.
Greengrocer role play shop – creating labels and prices tags for fruit/vegetables

Enrichment opportunities

Invite parents to talk about environmentally friendly jobs
Litter pick around the school grounds or local area
Make bug hotels using recycled materials
Visit to the farm
Egg to chick life cycle
Making a healthy plate
Caterlink cooking workshop
Food tasting
Vegetable plant/fruit growing in class

Suggested questions to measure impact:

What planet do we live on?
How is X planet different to X planet?
What is this material called? Describe how it feels.
Why is litter bad? Why should we recycle?
Is this animal nocturnal? How do you know?
How does X animal change as it grows older?
Is X food healthy or unhealthy?

Reception Summer – Plants & Dinosaurs

Prior learning

Recap Nursery learning: To know the names of the seasons and that seasons affect what we can see outside.
To know that my clothes may change to suit the weather or season

Summer 1 - Plants

Knowledge :

- To know that plants follow a life cycle in which they grow and change over time
- To know that plants grow from a seed or bulb.
- To know that plants need sunlight and water to grow.

Skills:

- To identify what plants need to grow
- To describe a life cycle using key vocabulary
- To make observations of plants changing over time

Summer 2 – Dinosaurs & Summer

Knowledge :

- To name some dinosaurs
- To know what dinosaurs ate and where they lived
- To know how the weather changes in Summer.

Skills:

- To compare dinosaurs to animals now
- To identify and recognise the key features of Summer
- To compare Summer to other seasons

Key Vocabulary

flowers, plants, soil, seeds, bulb, roots, stem, leaves, petals, sun, air, water, grow, life cycle, new, grow

onmivore, herbivore, carnivore, Tyrannosaurus Rex (T.rex) , Triceratops, Stegosaurus, Brachiosaurus, Velociraptor, fossil

Tips and tricks

Suggestions for Implementation

Garden centre and florist role-play
Exploring butterfly, frog and chick life cycles
Identifying seeds, stones and bulbs (fruit, veg, plants to dissect and identify parts)
Planting tuff tray
Measuring plant height/growth
Seed sorting – matching seeds to the flower/plant
Excavation role play
Dinosaur tuff tray (sand, water and land)
Salt dough fossils and skeleton art

Enrichment opportunities

Caterpillars from Insect Lore
Visit garden centre
Planting their own seeds
Plant growth investigation
Dinosaur workshop
Hertfordshire zoo (Dinosaur walk-thru)

Suggested questions to measure impact:

What is X part of a plant called?
What do plants need to grow?
How has the plant changed as it has grown?
What is X dinosaur called?
How is X dinosaur different to X dinosaur?
What does X dinosaur eat? Is it an omnivore, herbivore or carnivore?



Year 1



Clicking on a unit will take you to the knowledge and skills document which explains the unit in more detail.

Autumn 1	Autumn 2	Spring 1
Season - Autumn The Human Body and Healthy Eating	Season - Winter Everyday Materials	Animals including humans
Spring 2	**Summer 1**	**Summer 2**
Season - Spring Working Scientifically skills	Plants	Seasons – Summer

Suggestions for the development of greater depth throughout the year

I can make comparisons and draw findings from my tests

I can talk and write about what I can observe in an experiment

I can ask questions with growing complexity

Year 1 Autumn 1 - Seasons : Autumn and The Human Body + Healthy Eating

Prior learning

Recap Reception learning: To know the names of different body parts; To know that some foods are unhealthy; To know the names of common fruits and vegetables

Intent

Pupils will develop their observational skills and will be able to identify signs of autumn. They will be able to name a range of body parts and explain which body parts are associated with each sense. They will also develop an understanding of how they can make healthy lifestyle choices.

Key areas

- Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
- Observe changes across the four seasons
- Observe and describe weather associated with the autumn and how day length varies

Key Vocabulary

summer	winter
autumn	spring
day length	seasons
similarities and differences	
senses	body part
taste	touch
sight	smell
hearing	face
arm	legs
fingers	toes
nose	eyes
ears	mouth
healthy	diet

Working Scientifically skills

S2 - I can perform simple test

S2- I can observe closely, using simple equipment

S3 - I can ask simple questions

Tips and tricks

Suggestions for Implementation

To carry out investigations using the senses: walk around class with eyes covered and buddy guiding them using touch or sound

Autumn senses walk around the school

To taste a range fruit and vegetable discussing what they taste and feel like

Enrichment opportunities

Investigations: exploring an area with a sense removed
Leaf rubbings Collect conkers
Jump in puddles
Bring in clothing appropriate for autumn
Taste a range of chopped fruit and vegetable
Visit from Fizz Pop Science (Snotty Science workshop)

Suggested questions to measure impact:

How is Autumn different to the other seasons?
Why does our clothing change between the seasons?
How can you be healthy?
What foods are healthy?
Why are our senses important?
Which sense is the most important? Why?

Year 1 Autumn 2 - Seasons : Winter and Everday Materials

Prior learning

Recap Reception learning: To select appropriate materials according to their properties; To name and identify a range of different materials and to know how they are used in familiar environments

Recap Autumn 1 learning: Autumn

Intent

Pupils will develop their observational skills and will be able to identify signs of winter. They will be able to name a range of materials and use key vocabulary to describe them.

Key areas

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

Key Vocabulary

summer winter
autumn spring
seasons group
similarities and differences

material	physical property
object	soft
wood	hard
plastic	shiny
metal	dull
glass	rough
fabric	smooth
	clear
	waterproof

Working Scientifically skills

S2 - I can perform simple test

S2- I can observe closely, using simple equipment

S3 - I can ask simple questions

Tips and tricks

Suggestions for Implementation

To explore a range of materials and discuss key characteristics

To carry out investigations i.e make a boat any investigate whether it floats/sinks, make a teddy's jacket for the rain and the sun, explore cornflour, slime, moon sand

To make choices about the best materials for specific objects

Enrichment opportunities

Take a winter sense walk around the school

Play with snow in playground. Make a snowman

Bring in appropriate clothes for the winter

Suggested questions to measure impact:

Which materials could you make a teddy's jacket from? Why?

Which materials are suitable for X? Why?

How is winter different to the other seasons?

Why does our clothing change between the seasons?

Year 1 Spring 1 - Animals including humans

Prior learning

Recap Nursery learning: To know the difference between farm animals and wild animals; To be able to categorise animals by their characteristics; To know that difference creatures live in different places based on their characteristics, e.g. farm animals can live around people, however wild animals can be dangerous so we have to be careful. Wild animals live in forests/jungles/safari and sometimes zoos or aquariums.
Recap Reception learning: To know that some animals are nocturnal.
Recap Autumn term learning: Autumn and Winter

Intent

Pupils will develop their classification skills and will be able to group a range of animals according to similar characteristics.

Key areas

- 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.
- Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets).

Key Vocabulary

animals
fish
amphibians
birds
mammals
reptiles
diet
carnivores
herbivores
omnivores
observe
classify
group
compare

Working Scientifically skills

S2 - I can perform simple test

S2- I can observe closely, using simple equipment

S3 - I can ask simple questions

Tips and tricks

Suggestions for Implementation

To classify toy animals as a class, group and individually

To have investigations; have waxworms and mealworms in school ad investigate their likes and dislikes

Enrichment opportunities

Visit a farm and see new-born animals
Have hatching chicks in school/classrooms
Play with toy animals
Visit and feed the deer at Bentley Priory
Walk to Stanmore Marsh to find insects
Pupils to do show and tell about their pets or animals at home

Suggested questions to measure impact:

How are all X (animals) similar?
How are X (animals) and X (animals) different?
What do you call an animal that eats meat/ plants/ both?
How is spring different to the other seasons?
Why does our clothing change between the seasons?

Year 1 Spring 2 - Seasons: Spring and Working Scientifically skills

Prior learning

Recap Nursery learning: To know the difference between farm animals and wild animals; To be able to categorise animals by their characteristics; To know that difference creatures live in different places based on their characteristics, e.g. farm animals can live around people, however wild animals can be dangerous so we have to be careful. Wild animals live in forests/jungles/safari and sometimes zoos or aquariums.
Recap Reception learning: To know that some animals are nocturnal.
Recap Autumn term learning: Autumn and Winter

Intent

Pupils will develop their observational skills and will be able to identify signs of spring. They will develop their Working Scientifically skills, including asking questions, predicting, observing and measuring and recording results. They will make links to the use of Science in the real world and related careers.

Key areas

- Observe changes across the four seasons
- Observe and describe weather associated with the seasons and how day length varies
- Carry out scientifical investigations that focus on a Working Scientifically skill e.g. asking questions, predicting, observing and measuring and recording results.

Key Vocabulary

scientific investigation
question
prediction
observe
measure
equipment
record
compare
results

summer, winter, autumn, spring
seasons
similarities and differences
day length
weather

Working Scientifically skills

S2 - I can perform simple test

S2- I can observe closely, using simple equipment

S3 - I can ask simple questions

Tips and tricks

Suggestions for Implementation

Use TAPS lesson plans and resources
https://pstt.org.uk/unique-resources/taps/
Each lesson should have an LO with one clear Working Scientifically focus

https://www.stem.org.uk/explorify

Research an important scientist

Enrichment opportunities

Visitor to school from various science backgrounds
Visitor to science based professions i.e dentists
Science projects competitions
https://imascientist.org.uk/stayathome/teachers/

Suggested questions to measure impact:

Key questions on TAPS plans
What do you predict will happen?
Why did you observe?
What will you measure?
How is ____ similar/ different to _____?

Year 1 Summer 1 - Plants

Prior learning

Recap Nursery learning: To know that every living being has a life cycle and they change in shape and size as they grow.

Intent

Pupils will be able to identify and name a variety of wild and garden plants. They will develop their comparison skills by discussing similarities and differences between plants.

Key areas

- 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.

Key Vocabulary

garden plants
rose
lavender
pansy
daffodil
sunflower

wild plants
dandelion
daisy
buttercup
nettles
ivy

deciduous trees
beech ash sycamore
horse chestnut oak willow

evergreen trees

flower petals leaves stem
roots fruit seed bulb
flowering plant life cycle

Working Scientifically skills

S2 - I can perform simple test

S2- I can observe closely, using simple equipment

S3 - I can ask simple questions

Tips and tricks

Suggestions for Implementation

To dissect a flower and label its simple parts

To carry out investigations; to plant flowering plants and measure growth as a class, cut a flower off the top of the plant and see what happens if replanted, complete seed investigations, plant non-flowering plants

Enrichment opportunities

Plant flowers in the classroom or around the school and watch grow
Go to a gardening centre and see the different trees and plants
Go on a walk to Canons Park and see different trees and flowers,
Complete a scavenger hunt of trees and flowers
Hold a teddy bear picnic using plants as food (I.e tomatoes)

Suggested questions to measure impact:

What are the parts of a plant? What are they for?

Name some garden plants. Name some wild plants.

Why are plants useful? Explain your answer

What is different/similar between flowering and non-flowering plants?

What do plants need to grow?

Year 1 Summer 2 - Seasons: Summer

Prior learning

Recap Autumn/Spring 1 learning: Autumn, Winter and Spring

Intent

Pupils will develop their observational skills and will be able to identify signs of summer.

Key areas

- Observe changes across the four seasons
- Observe and describe weather associated with the seasons and how day length varies
- Explain how to stay safe in the sun

Key Vocabulary

summer
winter
autumn
spring
seasons
similarities and differences
day length
shade
sun cream
sun hat
protection
sun safety
temperature

Working Scientifically skills

S2 - I can perform simple test

S2- I can observe closely, using simple equipment

S3 - I can ask simple questions

Tips and tricks

Suggestions for Implementation

To carry out investigations: make a sunhat for teddy, to use sun cream, make a bottle for teddy to drink from which is waterproof, investigate which colours make your warmer and which colours make you cooler in the summer by making a summer outfit for teddy, what happens to ice lollies in the summer

Complete activities which affect the body i.e running and discuss what happens when the body gets too hot and how it can be cooled down

Enrichment opportunities

'Stay safe in the sun' poster competition
Put sun cream and hat on when out in the sun
See and talk to people who have been sunburnt
Pupils to bring in sunhats and sun cream to school
Have ice lollies in class for pupils to eat

Suggested questions to measure impact:

How is summer different to the other seasons?

Why does our clothing change between the seasons?

Do the days let longer or shorter in summer?

Would ice lollies be yummy in the winter? Why not?

What can we do to be safe in the sun?

Year 2





Clicking on a unit will take you to the knowledge and skills document which explains the unit in more detail.

Autumn 1	Autumn 2	Spring 1
Animals including humans	Everyday Materials	Living things and their habitats
Spring 2	**Summer 1**	**Summer 2**
Weather	Working Scientifically skills	Plants

Suggestions for the development of greater depth throughout the year

I can ask questions with growing complexity
I can identify similarities and differences when classifying
I can talk about and justify my classifying using scientific thinking
I can support my scientific views using evidence and finding drawn from experiments/investigations
I can raise further questions to investigate further following on from completed experiments/investigations

Year 2 Autumn 1 - Animals including humans

Prior learning

Recap Reception learning: To know that some foods are unhealthy,

Intent

Pupils will develop their identifying and classifying skills by matching animals to their offspring. They will be able to explain some ways in which humans and animals change as they grow. They will also classify food into different groups and develop their understanding of how they can make healthy lifestyle choices.

Key areas

- 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.

Key Vocabulary

offspring
water
food
air
exercise
basic needs
survival
hygiene
types of food
balanced diet
babies
grow
humans
animals

Working Scientifically skills

S1 - I can recognise that questions can be answered in different ways S2- I can ask simple questions when identifying and classifying S3 - I can use my observations and ideas to suggest answers to question S4- I can gather and record data to help in answering questions

Tips and tricks

Suggestions for Implementation

Pupils bring in photos from when they were younger to discuss changes

Carry out investigations: mouldy bread using clean, washed and dirty hands; track heart-beat pre and post heartbeat

Enrichment opportunities

Doctor/Dentist visit

Make/cook simple foods together

Suggested questions to measure impact:

How can you be healthy?
Why is exercise important?
What do you need to survive?
Where does food come from? What foods come from plants/animals/both?
How do humans change as they get older?
What can you do now that you couldn't do as a baby?

Year 2 Autumn 2 - Everyday materials

Prior learning

Recap Reception learning: To explore a range of materials and discuss key characteristics and to know how they are used in familiar environments

Recap Year 1 learning: To distinguish between an object and the material from which it is made, To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock, To describe the simple physical properties of a variety of everyday materials, To compare and group together a variety of everyday materials on the basis of their simple physical properties.

Intent

Pupils will be able to name a range of materials and use key vocabulary to describe their properties. They will compare different materials and evaluate which is most suitable for a purpose.

Key areas

- 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

Key Vocabulary

materials

wood metal

plastic glass

brick rock

paper cardboard

physical property

squashing bending

twisting stretching

rigid flexible

durable malleable

waterproof absorb

reduce reuse recycle

Working Scientifically skills

S2- I can ask simple questions when identifying and classifying S3 - I can use my observations and ideas to suggest answers to question S4- I can gather and record data to help in answering questions

Tips and tricks

Suggestions for Implementation

To carry out investigations i.e make model chairs using various materials justifying choice

Explore cornflour, slime, moon sand

To make choices about the best materials for specific objects

Enrichment opportunities

Find different materials around the school/home

Bring in different materials and discus suitability

Suggested questions to measure impact:

What are the properties of material X?

Why is x the best material for x?

What is not a good material to use? Why?

Year 2 Spring 1 - Living things and their habitats

Prior learning

Recap Year 1 learning: identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals, To identify and name a variety of common animals that are carnivores, herbivores and omnivores, To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)

Intent

Pupils will be able to identify a variety of habitats and describe their features. They will understand that habitats provide for the basic needs of the animals and plants that live in them. They will begin to appreciate that humans have an impact upon different habitats and that we should look after them.

Key areas

- 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 microhabitats
- 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.

Key Vocabulary

differences
living
dead
habitats
plants
animals
interdependence
microhabitats
food sources
food chain
prey
predator

Working Scientifically skills

S1 - I can recognise that questions can be answered in different ways S2- I can ask simple questions when identifying and classifying S3 - I can use my observations and ideas to suggest answers to question S4- I can gather and record data to help in answering questions

Tips and tricks

Suggestions for Implementation

Talk about and discuss photos of pets at home
Play with toy animals and classify them in various groups
Discuss simple food chain and make food chain collages
Discuss various habitats around the world and make habitats using shoe boxes
Watch live stream webcams of various animals around the world

Enrichment opportunities

Visit a zoo/farm
Visit Stanmore Marsh and investigate animals/insect around the marsh
Zoolab workshop
RSPCA/RSPCB workshop
Vet visit

Suggested questions to measure impact:

What's a habitat?
What are the different habitats you know?
What do all living things need to survive?
Can x (animal) live in x (habitat)? Why/why not?
Explain a food chain. What is the predator/prey in the food chain?

Year 2 Spring 2 - Weather

Prior learning

Recap Year 1 learning: To observe changes across the four seasons, To observe and describe weather associated with the seasons and how day length varies

Intent

Pupils will be able to identify the symbols used in weather forecasts and will create their own weather forecasts. They will consider what they already know about weather and generate further questions.

Key areas

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

Key Vocabulary

seasons

Summer, autumn, winter, spring

weather forecast symbol climate temperature degrees sunshine cloudy rain snow storm thunder lightening windy hurricane clear forecast meteorologist

Working Scientifically skills

S3 - I can use my observations and ideas to suggest answers to question questions

S4- I can gather and record data to help in answering

Tips and tricks

Suggestions for Implementation

Dress teddies for a range of weather
Measure rainfall
Look at and discuss different weather symbols
Track the weather over a period of time / the course of one day
Look at and understand how the sun is dangerous; Have a 'staying safe in the sun' drive, see and understand what sunburn is

Enrichment opportunities

Visit to Southend, play on beach, paddle in the sea, walk on pier and have ice cream
Watch the weather forecast on television
Read the weather forecast in the newspaper
Look at and understand how the sun is dangerous

Suggested questions to measure impact:

What are the four seasons?

How does the weather change during the year?

Name a type of weather and draw the symbol.

How are X and X weathers similar/ different?

Year 2 Summer 1 - Working Scientifically skills

Prior learning

Recap Year 1 learning: Work Scientifically Skills - asking questions, predicting, observing and measuring and recording results

Intent

Pupils will further develop their Working Scientifically skills and will begin to use a wider range of scientific vocabulary. They will make links to the use of Science in the real world and related careers.

Key areas

- Carry out scientifical investigations that focus on a Working Scientifically skill e.g. asking questions, predicting, observing and measuring and recording results.
- Name a variety of jobs which involve science.

Key Vocabulary

scientific investigation
question
prediction
observe
measure
equipment
record
results
evidence
explain
compare

Working Scientifically skills

S1 - I can recognise that questions can be answered in different ways S2- I can ask simple questions when identifying and classifying S3 - I can use my observations and ideas to suggest answers to question S4- I can gather and record data to help in answering questions

Tips and tricks

Suggestions for Implementation

Use TAPS lesson plans and resources
https://pstt.org.uk/unique-resources/taps/
Each lesson should have an LO with one clear Working Scientifically focus

https://www.stem.org.uk/explorify

Research an important scientist

Enrichment opportunities

Visitor to school from various science backgrounds
Visitor to science based professions i.e dentists
Science projects competitions
https://imascientist.org.uk/stayathome/teachers/

Suggested questions to measure impact:

Key questions on TAPS plans
What do you predict will happen?
Why did you observe?
What will you measure?
How is ____ similar/ different to _____?

Year 2 Summer 2 - Plants

Prior learning

Recap Reception learning: To know that humans and other animals grow

Recap Year 1 learning: To identify and describe the basic structure of a variety of common flowering plants, including trees.

Intent

Pupils will experience growing plants in different environments to understand what plants need to grow. They will develop their observation and explaining skills.

Key areas

- 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.

Key Vocabulary

seeds
bulbs
growth
plants
water
light
temperature
suitability
healthy
germination
nutrients

Working Scientifically skills

S1 - I can recognise that questions can be answered in different ways S2- I can ask simple questions when identifying and classifying S3 - I can use my observations and ideas to suggest answers to question S4- I can gather and record data to help in answering questions

Tips and tricks

Suggestions for Implementation

Plant seeds/bulbs in a range of places to explorer importance of warmth, light and water

Watch time lapse video of growing seeds and plants

Enrichment opportunities

Play with and dissect sycamore seeds
Plant seeds/bulbs around school/classroom and watch grow
Go on walk around Canons Park to see a range of plants/flowers/trees
Complete a plant scavenger hunt
Collect conkers (both the seed and the outside covering)

Suggested questions to measure impact:

What are the parts of a plant? What are their functions?

What does a plant need in order to grow well?

How do seed/ bulbs change as they grow?

Year 3





Clicking on a unit will take you to the knowledge and skills document which explains the unit in more detail.

Autumn 1	Autumn 2	Spring 1
Forces and magnets	Light	Animals including humans
Spring 2	**Summer 1**	**Summer 2**
Working Scientifically skills	Plants	Rocks

Suggestions for the development of greater depth throughout the year

I can explain the important of careful observations
I can explain how to do this to others and why it is important to be accurate
I can discuss my findings orally and in written form
I can construct or suggest how to complete my own enquiry to answer a scientific question
I can explain variables and the important of a controlled variable

Year 3 Autumn 1 - Forces and Magnets

Prior learning

Recap Year 2 learning: Compared and grouped materials based on their properties

Intent

Pupils will conduct scientific investigations to observe the effects of different forces. They will develop their observation, comparing and classification skills.

Key areas

- Compare how things move on different surfaces
- Notice that some forces need contact between two objects, but magnetic forces can act at a distance
- 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
- Describe magnets as having two poles
- Predict whether two magnets will attract or repel each other, depending on which poles are facing.

Key Vocabulary

forces

push pull

friction

magnet magnetism

magnetic non-magnetic

north pole south pole

attract repel

metal

Working Scientifically skills

S1 I can make systematic and careful observation S2 I can gather, record data in a variety of ways to help answer questions
S3 I can record findings using simple scientific language, drawings, labelled diagrams S4 I can use results to draw simple conclusions, make predictions for new values
S5 I can use straightforward scientific evidence to answer questions or to support their findings S6 I can report on findings from enquiries, including oral and written explanations

Tips and tricks

Suggestions for Implementation

Play with different types of magnets

Test and group magnetic and non-magnetic materials using magnets

Push cars down different surfaces and compare which move faster and slower. Relate this to the effects of friction.

Enrichment opportunities

Find different magnetic/non-magnetics materials around the school/home

Suggested questions to measure impact:

Why are magnets useful?

Give examples of magnetic and non-magnetic materials.

What happens when two magnets meet? What happens when the same/ opposite poles meet?

Year 3 Autumn 2 - Light

Prior learning

Recap Year 1 learning: Explain how to stay safe in the sun

Intent

Pupils will understand how light help us see. They will investigate how shadows are formed and can be changed. They will be able to explain how to protect themselves from the dangers of the sun.

Key areas

- 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 an opaque object
- Find patterns in the way that the size of shadows change.

Key Vocabulary

light source
artificial
natural
dark
reflect
block
shadow
light ray
surface

transparent
translucent
opaque

Working Scientifically skills

S1 I can make systematic and careful observation S2 I can gather, record data in a variety of ways to help answer questions
S3 I can record findings using simple scientific language, drawings, labelled diagrams S4 I can use results to draw simple conclusions, make predictions for new values
S5 I can use straightforward scientific evidence to answer questions or to support their findings S6 I can report on findings from enquiries, including oral and written explanations

Tips and tricks

Suggestions for Implementation

To carry out investigations; refract light through prisms.

Draw around shadows in the playground at different times during the day to notice changes in shadows

Make shadow puppets

Enrichment opportunities

Put sun cream, hat and sunglasses on, when out in the sun
See people who have been sunburnt
Pupils to bring sunhats and sun cream to school
‘Safe in the sun’ poster competition

Suggested questions to measure impact:

How does light help us see?

What is a shadow? How is it made?

How does your shadow change during the day? When is it longest/ shortest?

What can you do to protect yourself in the sun?

Year 3 Spring 1 - Animals including humans

Prior learning

Recap Year 1 learning: To identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
Recap Year 2 learning: To find out about and describe the basic needs of animals, including humans, for survival (water, food and air), To describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Intent

Pupils will understand the nutritional value of food and know how to make healthy food choices. They will understand that humans and other animals have skeletons for support, protection and movement. They will be able to name and label some of the major bones in the human body.

Key areas

- 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.

Key Vocabulary

endoskeleton
exoskeleton
backbone
vertebrates
invertebrates
support
protection
movement
skull
spine
rib cage
collar bone
pelvis
kneecap
nutrition
balanced diet
energy
carbohydrates
protein
vitamins
minerals
dairy
fat
sugar
water

Working Scientifically skills

S1 I can make systematic and careful observation S2 I can gather, record data in a variety of ways to help answer questions
S3 I can record findings using simple scientific language, drawings, labelled diagrams S4 I can use results to draw simple conclusions, make predictions for new values
S5 I can use straightforward scientific evidence to answer questions or to support their findings S6 I can report on findings from enquiries, including oral and written explanations

Tips and tricks

Suggestions for Implementation

Explore model skeletons individually, pairs and group

Make and label bones in skeleton

To create a 'healthy plate' incorporating different types of foods

To carry out investigations: how much sugar is in drinks?

Enrichment opportunities

To create a meal plan
Make/cook healthy foods

Suggested questions to measure impact:

What's the difference between an endo and exo skeleton?

What types of food do humans need? Give examples of them (I.e carbohydrates, protein, sugars, etc)

What do muscles do? Why are they important?
How can humans stay healthy?

Year 3 Spring 2 - Working Scientifically Skills

Prior learning

Recap Year 1 & 2 learning: Work Scientifically Skills - asking questions, predicting, observing and measuring and recording results

Intent

Pupils will further develop their Working Scientifically skills and will begin to accurately use a wider range of scientific vocabulary. They will make links to the use of Science in the real world and related careers.

Key areas

- Carry out scientifical investigations that focus on a Working Scientifically skill e.g. asking questions, setting up experiments, observing and measuring, recording results, classifying and presenting data and drawing conclusions.
- Name a variety of jobs which involve science.

Key Vocabulary

scientific investigation
fair test
apparatus
prediction
observe
measure
classify
record
data
results
evidence
conclusion
compare

Working Scientifically skills

S1 I can make systematic and careful observation S2 I can gather, record data in a variety of ways to help answer questions
S3 I can record findings using simple scientific language, drawings, labelled diagrams S4 I can use results to draw simple conclusions, make predictions for new values
S5 I can use straightforward scientific evidence to answer questions or to support their findings S6 I can report on findings from enquiries, including oral and written explanations

Tips and tricks

Suggestions for Implementation

Use TAPS lesson plans and resources
https://pstt.org.uk/unique-resources/taps/
Each lesson should have an LO with one clear Working Scientifically focus

https://www.stem.org.uk/explorify

Research an important scientist

Enrichment opportunities

Visitor to school from various science backgrounds
Visitor to science based professions i.e dentists
Science projects competitions
https://imascientist.org.uk/stayathome/teachers/

Suggested questions to measure impact:

Key questions on TAPS plans
What do you predict will happen?
Why did you choose this piece of equipment?
What will you use to measure?
What will be the most effective way to collect/present your results?
What conclusions can you draw from your results?

Year 3 Summer 1 - Plants

Prior learning

Recap Year 1 learning: To identify and describe the basic structure of a variety of common flowering plants, including trees.
Recap Year 2 learning: To observe and describe how seeds and bulbs grow into mature plants, To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Intent

Pupils will be able to describe the life cycle of a flowering plant. They will understand the functions of different parts of a plant. They will be able to explain how a plant grows, including different types of seed dispersal.

Key areas

- 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.

Key Vocabulary

flower stem trunk leaves roots nutrients

stamen stigma ovary pollen pollination fertilisation germination seed formation

seed dispersal
life cycle

Working Scientifically skills

S1 I can make systematic and careful observation S2 I can gather, record data in a variety of ways to help answer questions
S3 I can record findings using simple scientific language, drawings, labelled diagrams S4 I can use results to draw simple conclusions, make predictions for new values
S5 I can use straightforward scientific evidence to answer questions or to support their findings S6 I can report on findings from enquiries, including oral and written explanations

Tips and tricks

Suggestions for Implementation

To dissect a flower and label its simple parts

To carry out investigations: to plant flowering plants and measure growth as class, cut a flower off the top of the plant and see what happens if replanted, cut a flowering plant in half and put each half in different colour water pots and see what happens over time to the petals, 'walking water' investigation

Watch a time lapse video of growing plants

Enrichment opportunities

Dissect and play with sycamore seeds

Grow flowering plants in class/around the school

Suggested questions to measure impact:

What are the parts of a plant? What are their functions?

What does a plant need in order to grow well?

How are seeds formed? How can they be dispersed?

How does water travel around a plant?

Year 3 Summer 2 - Rocks

Prior learning

Recap Year 2 learning: identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses

Intent

Pupils will understand that rocks and soils are made from organic matter. They will investigate the properties of different rocks and soils, identifying the similarities and differences. They will also investigate how fossils are formed and the information they can tell us about the past.

Key areas

- 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.

Key Vocabulary

rock
soil
grains
crystals
layers
texture
absorb
volcano
lava
fossil
paleontologist

metamorphic
sedimentary
igneous
marble
granite
sandstone
slate
chalk

chalky soil
clay soil
sandy soil
peaty soil

Working Scientifically skills

S1 I can make systematic and careful observation S2 I can gather, record data in a variety of ways to help answer questions
S3 I can record findings using simple scientific language, drawings, labelled diagrams S4 I can use results to draw simple conclusions, make predictions for new values
S5 I can use straightforward scientific evidence to answer questions or to support their findings S6 I can report on findings from enquiries, including oral and written explanations

Tips and tricks

Suggestions for Implementation

Make fossils using Plaster of Paris

To carry out investigations on rocks based on their appearance and physical properties

Investigate the different layers of rocks and soil

Group and classify different types of rocks

Learn about Mary Anning

Enrichment opportunities

Visit to National History Museum (Mary Anning workshop/Investigate workshop)
Visit from UCL Geobus
Have a visit from a geologist/palaeontologist/archaeologist
Visit the dinosaurs at Crystal Palace

Suggested questions to measure impact:

How is X (rock) similar or different to X (rock)?

How is X (soil) similar or different to X (soil)?

Who was Mary Anning? Why is she important?

How are fossils made?

Year 4





Clicking on a unit will take you to the knowledge and skills document which explains the unit in more detail.

Autumn 1	Autumn 2	Spring 1
Animals including humans	Sound	States of Matter
Spring 2	**Summer 1**	**Summer 2**
Living things and their habitat	Electricity	Working Scientifically skills

Suggestions for the development of greater depth throughout the year

I can construct or suggest how to complete my own enquiry to answer a scientific question I can use a range if equipment accurately I can support my scientific views using evidence and findings drawn from experiments/investigations to answer questions I can raise further questions to investigate further following on from completed experiments/investigations I can critically review completed experiments/investigations I can talk and write clearly about my scientific learning and understanding

Year 4 Autumn 1 - Animals including humans

Prior learning

Recap Year 2 learning: To describe the importance for humans of exercise and eating the right amounts of different types of food.
Recap Year 3 learning: To 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

Intent

Pupils will understand and describe what happens to food as it travels through the digestive system. They will be able to construct food chains and use the vocabulary of producer, predator and prey.

Key areas

- 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

Key Vocabulary

digest
saliva
oesophagus
stomach
small intestine
large intestine
rectum

milk teeth
incisor
canine
premolar
molar
enamel

food chain
producer
consumer
predator
prey

herbivore
omnivore
carnivore

Working Scientifically skills

S1 I can ask relevant questions and use different types of scientific enquiries to answer them S2 I can take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers S3 I can classify and present data in a variety of ways to help answer questions, S4 I can use results to suggest improvements and raise further questions S5 I can identify differences, similarities or changes related to simple scientific ideas and processes S6 I can report on presentations of results and conclusions S7 I can record findings using keys, bar charts, and tables

Tips and tricks

Suggestions for Implementation

Complete investigations; Dissolve candy canes, Absorption investigations: sugar cubes, gummy bears

Tooth decay investigation, make ‘poo’, digestion investigation

Make a mouth using marshmallows

Enrichment opportunities

Visit a farm or zoo
Zoolab animal workshop
Look at real fox poo
Play with toy animals

Suggested questions to measure impact:

What are the names and functions of human teeth?

Can you tell if this animal is a omnivore, carnivore or herbivore from it’s teeth? How?

What is the name and function of different organs involved in the human digestive system?

Identify the producers, consumers, predators and prey in the food chain.

Year 4 Autumn 2 - Sound

Prior learning

Recap Year 3 learning: To identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Intent

Pupils will be able to explain how humans hear sound. They will have the opportunity to experiment with changing pitch and identifying patterns between volume and sound.

Key areas

- 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.

Key Vocabulary

sound source
sound wave
vibration
absorb
amplitude
volume
pitch
distance

ear canal
ear drum
cochlea
auditory nerve

Working Scientifically skills

S1 I can ask relevant questions and use different types of scientific enquiries to answer them S3 I can classify and present data in a variety of ways to help answer questions, S4 I can use results to suggest improvements and raise further questions S5 I can identify differences, similarities or changes related to simple scientific ideas and processes S6 I can report on presentations of results and conclusions S7 I can record findings using keys, bar charts, and tables

Tips and tricks

Suggestions for Implementation

Explore the world around them minimising a sense (hearing)

Hear/see the trains travelling in and out of Stanmore station

Carry out investigations: Ear gongs using metal, wooden and plastic hangers, make a panpipe using different length straws

Enrichment opportunities

Play games on the bench without speaking
Learn British Sign Language

Suggested questions to measure impact:

How does sound travel?

What are the parts of the ear? Which part is the most useful? Why?

How can you change the pitch/ volume of a sound?

Year 4 Spring 1 - States of Matter

Prior learning

Recap Year 4 Autumn 2 learning: To identify that sounds are made when particles vibrate

Intent

Pupils will know that all matter is either solid, liquid or gas. They will compare states of matter and investigate how states of matter can be changed.

Key areas

- 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 of matter
change of state
solid
liquid
gas
particle
melt
freeze
condense
temperature
thermometer
degrees
water cycle
water vapour
precipitation
evaporation
condensation
melting point
freezing point

Working Scientifically skills

S1 I can ask relevant questions and use different types of scientific enquiries to answer them S2 I can take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers S3 I can classify and present data in a variety of ways to help answer questions, S4 I can use results to suggest improvements and raise further questions S5 I can identify differences, similarities or changes related to simple scientific ideas and processes S6 I can report on presentations of results and conclusions S7 I can record findings using keys, bar charts, and tables

Tips and tricks

Suggestions for Implementation

Find a range of solids and liquids and classify them
Identify and notice differences between solids, liquids and gases
Collect rainfall, measure puddle size over time
Make own water cycles
Carry out investigations: melt ice cubes in a warm and cold place using a timer and thermometer to measure, coke and mentos, dancing raisins, sugar crystals on a string, make lava lamps, mix water and oil, make lollipops, make slime using cornflour, make moon sand

Enrichment opportunities

Go on a bus or train journey and see condensation on windows
Visit Affinity Water, Bushey
Go outside in the rain
Jump in puddles

Suggested questions to measure impact:

What are the differences between solids, liquids and gases?

What happens to a solid, liquid or gases when it is heated/cooled?

Explain the stages of the Water Cycle.

How can you speed up evaporation?

What would happen if there wasn't any rain? Why?

Year 4 Spring 2 - Living things and their habitats

Prior learning

Recap Year 1 learning: To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals, To identify and name a variety of common animals that are carnivores, herbivores and omnivores, To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)

Recap Year 2 learning: To 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.

Intent

Pupils will create and use classification keys to identify living things. They will understand how changing environments can put animals in danger. They will consider how we can help protect animal habitats.

Key areas

- 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.

Key Vocabulary

classification key
characteristics
species
vertebrates
mammals
reptiles
amphibians
birds
fish
invertebrates

habitat
environment
endangered
extinct
conservation
deforestation
pollution
urbanisation
flood
drought
fire

Working Scientifically skills

S1 I can ask relevant questions and use different types of scientific enquiries to answer them S3 I can classify and present data in a variety of ways to help answer questions, S5 I can identify differences, similarities or changes related to simple scientific ideas and processes

Tips and tricks

Suggestions for Implementation

Make a hurricane in a jar, jelly earthquakes, jelly volcanoes, volcano experiments; sweet classification keys using liquorice all sorts
Classify and group toy animals individually, in pairs or in groups
Watch Newsround for reports on earthquakes, oil slicks, tsunamis, hurricanes and volcanoes

Enrichment opportunities

Visit a farm or zoo
Zoolab animal workshop

Suggested questions to measure impact:

How could you group different living things? Explain your reasoning

How can animals/humans be affected if an environment changes?

How can humans affect animals/the environment positively/negatively?

Year 4 Summer 1 - Electricity

Prior learning

Recap Year 3 learning: To 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

Intent

Pupils will identify everyday appliances at home and school that run on electricity. They will construct circuits and name the components. They will learn the symbols needed to scientifically draw a circuit diagram.

Key areas

- 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.

Key Vocabulary

mains powered
battery powered
electrical current
electrical safety
electrical conductor
electrical insulator

circuit
component
battery
cell
bulb
buzzer
motor
switch

Working Scientifically skills

S1 I can ask relevant questions and use different types of scientific enquiries to answer them S3 I can classify and present data in a variety of ways to help answer questions, S4 I can use results to suggest improvements and raise further questions S5 I can identify differences, similarities or changes related to simple scientific ideas and processes S6 I can report on presentations of results and conclusions S7 I can record findings using keys, bar charts, and tables

Tips and tricks

Suggestions for Implementation

Explore and make circuits individually, in pairs and in groups using a range of resources typical of a circuit (wires/cells etc) and not typical (metal spoons, wooden rolling pins etc)
Make fruit batteries; graphite circuits; static butterfly experiment; build and electric motor

Enrichment opportunities

Electricity show and Wonderlab experience at the Science Museum

Take apart electrical items to see how they work

Suggested questions to measure impact:

What appliance runs on electricity?

What symbol matches with this component?

How could you test which materials are electrical conductors and which are insulators?

How will this switch affect your circuit?

Year 4 Summer 2 – Working Scientifically Skills

Prior learning

Recap Year 3 learning: Work Scientifically Skills – setting up simple enquiries, observing, measuring, recording results and drawing simple conclusions

Intent

Pupils will further develop their Working Scientifically skills and will begin to accurately use a wider range of scientific vocabulary. They will make links to the use of Science in the real world and related careers.

Key areas

- Carry out scientifical investigations that focus on a Working Scientifically skill e.g. asking questions, setting up experiments, observing and measuring, recording results, classifying and presenting data and drawing conclusions.
- Name a variety of jobs which involve science.

Key Vocabulary

scientific investigation
fair test
apparatus
prediction
observe
Measure
variable
classify
record
data
results
evidence
conclusion
evaluate

Working Scientifically skills

S1 I can ask relevant questions and use different types of scientific enquiries to answer them S3 I can classify and present data in a variety of ways to help answer questions, S4 I can use results to suggest improvements and raise further questions S5 I can identify differences, similarities or changes related to simple scientific ideas and processes S6 I can report on presentations of results and conclusions S7 I can record findings using keys, bar charts, and tables

Tips and tricks

Suggestions for Implementation

Use TAPS lesson plans and resources
https://pstt.org.uk/unique-resources/taps/
Each lesson should have an LO with one clear Working Scientifically focus

https://www.stem.org.uk/explorify

Research an important scientist

Enrichment opportunities

Visitor to school from various science backgrounds
Visitor to science based professions i.e dentists
Science projects competitions
https://imascientist.org.uk/stayathome/teachers/

Suggested questions to measure impact:

Key questions on TAPS plans
What do you predict will happen?
Why did you choose this piece of equipment?
What will you use to measure?
What will be the most effective way to collect/present your results?
What conclusions can you draw from your results?

Year 5





Clicking on a unit will take you to the knowledge and skills document which explains the unit in more detail.

Autumn 1	Autumn 2	Spring 1
Forces and Motions	Earth and Space	Properties and changes of materials
Spring 2	**Summer 1**	**Summer 2**
Working Scientifically skills	Living thing and their habitats	Animals including humans

Suggestions for the development of greater depth throughout the year

I can take measurements accurately and explain how to do this to others and why it is important to be accurate I can choose appropriate ways to present my data ad discuss why I have chosen that way I can discuss my findings orally and in written form using diagrams and labels, classification keys and tables to support or disprove my ideas I can construct or suggest how to complete my own enquiry to answer a scientific question I can critically review completed experiments/investigations

Year 5 Autumn 1 - Forces and Motions

Prior learning

Recap Year 3 learning: To compare how things move on different surfaces. To notice that some forces need contact between two objects, but magnetic forces can act at a distance.

Intent

Pupils will conduct scientific investigations to observe the effects of different forces. They will develop their observation, comparing and classification skills. They will also investigate how mechanisms that include levers, pulleys and gears allow a smaller force to have a greater effect.

Key areas

- 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.

Key Vocabulary

force
gravity
friction
air resistance
water resistance
newton (N)
mass
surface area

mechanism
lever
pulley
gear

Working Scientifically skills

S1 I can record data and results of increasing complexity using scientific diagrams and labels, classification keys and tables S2 I can use test results to make predictions to set up further comparative and fair tests S3 I can plan different types of scientific enquiries to answer questions, including recognising the variable S4 I can identify scientific evidence that has been used to support or refute ideas or arguments S5 I can take measurements using a range of scientific equipment

Tips and tricks

Suggestions for Implementation

To carry out investigations; push cars down a range of surfaces and time how long they take to go down them; wear a range of footwear and travel on different surfaces and see what happens; how much force is needed to break eggshells?
Make plastic bottle/film cannister rockets, a parachute for a boiled egg, a boat which floats, a balloon powered car
Write stories about life without a given force (i.e a world without gravity)

Enrichment opportunities

Visit Wonderlab at the Science Museum
Find out the most common force in action in school/at home

Suggested questions to measure impact:

Why is x (force) useful?

What would happen if you didn't have x (force)? Why?

What forces are acting on this object?

What me mechanism could we use to make it easier to lift this heavy load?

Year 5 Autumn 2 - Earth and Spaces

Prior learning

Recap Year 1 learning: To observe changes across the four seasons, To observe and describe weather associated with the seasons and how day length varies

Intent

Pupils will research and learn about the planets in our solar system. They will describe the movement of the Earth and Moon and will understand that the Earth's rotation causes day and night.

Key areas

- 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
- Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Key Vocabulary

Solar system
Sun
Mercury
Venus
Earth
Mars
Jupiter
Saturn
Neptune
Uranus

star
planet
Moon
satellite
orbit
rotate
axis
spherical

Working Scientifically skills

S1 I can record data and results of increasing complexity using scientific diagrams and labels, classification keys and tables S2 I can use test results to make predictions to set up further comparative and fair tests S3 I can plan different types of scientific enquiries to answer questions, including recognising the variable S4 I can identify scientific evidence that has been used to support or refute ideas or arguments S5 I can take measurements using a range of scientific equipment

Tips and tricks

Suggestions for Implementation

Make solar system/rocket models
Make a pinhole camera
Make sun dials
Track lunar cycles
Use different pieces of fruit and the playground in relation to the actual size to illustrate the size and planets in space (fruit and distance in correlation to the actual size)

Enrichment opportunities

Watch lunar eclipse
Visit IMAX and Wonderlab at Science Museum
Visit Greenwich Observatory
Visit to/from Mill Hill Observatory
Look at stars in the night sky
Make constellations and star signs

Suggested questions to measure impact:

How does the Earth move around the Sun?

How does the Moon move around the Earth?

Why does the Sun seem to move in the sky?

Why is there day and night?

What is the order of the planets in our Solar System?

Year 5 Spring 1 - Properties and changes of materials

Prior learning

Recap Year 2 learning: To find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

Recap Year 4 learning: To compare and group materials together, according to whether they are solids, liquids or gases, To 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), To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

Intent

Pupils will conduct scientific investigations to observe reversible and irreversible changes. They will group and compare materials based on their properties and give reasons for particular uses of everyday materials,

Key areas

- 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
- 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.

Key Vocabulary

material
solid
liquid
gas
particle
reversible change
irreversible change

filtering
sieving
evaporating
condensing
dissolving
solubility

melting
freezing
conductor
insulator
transparency
mixture

Working Scientifically skills

S1 I can record data and results of increasing complexity using scientific diagrams and labels, classification keys and tables S2 I can use test results to make predictions to set up further comparative and fair tests S3 I can plan different types of scientific enquiries to answer questions, including recognising the variable S4 I can identify scientific evidence that has been used to support or refute ideas or arguments S5 I can take measurements using a range of scientific equipment

Tips and tricks

Suggestions for Implementation

Dissolving activities; dissolve candy canes, dissolve salt/sugar in water
Filtering activities; make own filter, filter dirty water
Irreversible activities; coke and mento rockets, cooking activities, bicarbonate of soda activities, burn paper
Play with magnets

Enrichment opportunities

Density activities; oil and water, ‘dancing raisins’
Create a fire
Evaporation activities; draw around puddles and time their evaporation/measure their decreasing size
Absorption activities; add liquids to sugar cubes, make sugar cube towers

Suggested questions to measure impact:

Is _____ a reversable or irreversible change? How do you know?

What process could you use to separate these materials?

What new material is formed when _____?

What material would you use to make _____? Why?

Year 5 Spring 2 - Working Scientifically Skills

Prior learning

Recap Year 3 & 4 learning: Work Scientifically Skills – setting up simple enquiries, observing, measuring, recording results and drawing simple conclusions.

Intent

Pupils will further develop their Working Scientifically skills and will accurately use a wider range of scientific vocabulary. They will continue to make links to the use of Science in the real world and related careers.

Key areas

- Carry out scientifical investigations that focus on a Working Scientifically skill e.g. asking questions, planning and setting up experiments, observing and measuring, recording results, classifying and presenting data, drawing conclusions and evaluating the reliability of results.
- Name a variety of jobs which involve science.

Key Vocabulary

scientific investigation
fair test
independent variable
dependent variable
control variable
prediction
observe
measure
repeat readings
classify
evidence
conclusion
interpret
evaluate
reliability

Working Scientifically skills

S1 I can record data and results of increasing complexity using scatter graphs, bar and line graphs **S2** I can plan different types of scientific enquiries to answer questions, controlling variables where necessary **S3** I can 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
S4 I can take measurements, using a range of scientific equipment with increasing accuracy and precision, taking repeat readings when appropriate

Tips and tricks

Suggestions for Implementation

Use TAPS lesson plans and resources
https://pstt.org.uk/unique-resources/taps/
Each lesson should have an LO with one clear Working Scientifically focus

https://www.stem.org.uk/explorify

Research an important scientist

Enrichment opportunities

Visitor to school from various science backgrounds
Visitor to science based professions i.e dentists
Science projects competitions
https://imascientist.org.uk/stayathome/teachers/

Suggested questions to measure impact:

Key questions on TAPS plans
What variable will you change?
What variable will you measure?
What will be the most effective way to collect/present your results?
What conclusions can you draw from your results?
How reliable are your results? Could any other variables have affected your results?

Year 5 Summer 1 - Living Things and their Habitats

Prior learning

Recap Year 1 learning: To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
Recap Year 2 learning: To notice that animals, including humans, have offspring which grow into adults
Recap Year 3 learning: To investigate the way in which water is transported within plants, To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Intent

Pupils will understand how animals and plants reproduce. They will draw and describe the life cycles of different vertebrates, explaining how animals change and develop as they grow.

Key areas

- 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.

Key Vocabulary

life cycle
sexual reproduction
fertilisation
asexual reproduction
pollination
gestation
metamorphosis
larva pupa

vertebrate
mammal
reptile
amphibian
bird
fish

Working Scientifically skills

S1 I can record data and results of increasing complexity using scientific diagrams and labels, classification keys and tables
S4 I can identify scientific evidence that has been used to support or refute ideas or arguments

Tips and tricks

Suggestions for Implementation

Make life cycles for mammals/amphibians and birds
Cup tops of plants and replant them
Dissect flowers and locate reproductive parts of a plant

Enrichment opportunities

Visit Affinity Water and see wildlife near water
To bring in pictures of pets at different ages and notice differences over time

Suggested questions to measure impact:

How is a _____ life cycle similar to a _____ life cycle?

How is a _____ life cycle different to a _____ life cycle?

How do plants reproduce?

Year 5 Summer 2 - Animals including humans

Prior learning

Recap Year 1 learning: To know that humans and other animals can grow.
Recap Year 2 learning: Notice that animals, including humans, have offspring which grow into adults

Intent

Pupils will be able to identify the different stages of the human lifecycle. They will describe a variety of ways that humans change as they grow and develop.

Key areas

- Describe the changes as humans develop to old age.

Key Vocabulary

life cycle
reproduction
fertilisation
gestation
foetus
Infancy
adolescence
puberty
adulthood
life expectancy
change
develop

Working Scientifically skills

S1 I can record data and results of increasing complexity using scientific diagrams and labels, classification keys and tables

Tips and tricks

Suggestions for Implementation

Bring in photos of themselves/family at different ages and notice differences over time

Enrichment opportunities

Write letters to/visit care homes

Suggested questions to measure impact:

At what stage of development do humans _____?

How to humans change during puberty?

What can you do now that you could not as a baby or toddler?

Year 6





Clicking on a unit will take you to the knowledge and skills document which explains the unit in more detail.

Autumn 1	Autumn 2	Spring 1
Light	Electricity	Evolution and Inheritance
Spring 2	**Summer 1**	**Summer 2**
Living things and their habitat	Working Scientifically skills	Circulatory system

Suggestions for the development of greater depth throughout the year

I can take measurements accurately and explain how to do this to others and why it is important to be accurate I can discuss my findings orally and in written form using various graphs to support or disprove my ideas I can construct or suggest how to complete my own enquiry to answer a scientific question I can explain variables and the important of a controlled variable

Year 6 Autumn 1 - Light

Prior learning

Recap Year 3 learning: To recognise that they need light in order to see things and that dark is the absence of light, To notice that light is reflected from surfaces, To recognise that light from the sun can be dangerous and that there are ways to protect their eyes, To recognise that shadows are formed when the light from a light source is blocked by an opaque object, To find patterns in the way that the size of shadows change

Intent

Pupils will be able to explain how light travels and allows us to see. They will understand that light is reflected off a surface. They will also investigate how they can change the appearance of shadows.

Key areas

- 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.
- Understand that light refracts when it moves from one material to another

Key Vocabulary

light source
light ray
reflect
refract
shadow
transparent
translucent
opaque
periscope
lens
pupil
iris
cornea
retina
optic nerve

Working Scientifically skills

S2 I can plan different types of scientific enquiries to answer questions, controlling variables where necessary
S3 I can 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

Tips and tricks

Suggestions for Implementation

Make telescopes using mirrors
Use prisms to explore light
Create shadow puppets
Play with torches and a range of materials and record what pupils find out

Enrichment opportunities

Create a periscope
Walk in the dark/without the sense of sight
Watch shadow puppet show

Suggested questions to measure impact:

How does light travel? How do you know?
How can we see things?
What would happens if there wasn't light? Why?
What happens when something blocks light?

Year 6 Autumn 2 - Electricity

Prior learning

Recap Year 4 learning: To identify common appliances that run on electricity, To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers, 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. To recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit, To recognise some common conductors and insulators, and associate metals with being good conductors.

Intent

Pupils will construct circuits and name the components. They will draw scientific circuit diagrams with the correct symbols. They will investigate the effect of changing the voltage on the components in a circuit.

Key areas

- 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 when representing a simple circuit in a diagram.
- Understand how electrical current flows around a series and parallel circuit

Key Vocabulary

current
voltage volts
electrical conductor
electrical insulator

series circuit
parallel circuit
component
battery
cell
bulb
buzzer
motor
switch

Working Scientifically skills

S2 I can plan different types of scientific enquiries to answer questions, controlling variables where necessary
S3 I can 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

Tips and tricks

Suggestions for Implementation

Play with circuits using buzzers, bulbs and switches
Investigate where buzzers/alarms are used in real life
Use a range of materials to increase volume of buzzer and brightness of bulbs

Enrichment opportunities

Make fruit batteries (lemon)
Build an electric motor

Suggested questions to measure impact:

What symbol represents X component?
What happens to your circuit when you add/ remove/ change ____? Why?
How can you make the bulb brighter/ dimmer?
How can you make the buzzer louder/ quieter?
What is the difference between a series and parallel circuit?

Year 6 Spring 1 - Evolution and Inheritance

Prior learning

Recap Year 4 learning: To identify the different types of teeth in humans and their simple functions
Recap Year 5 learning: To describe the changes as humans develop to old age.

Intent

Pupils will understand that offspring inherit their characteristics from their parents. They will understand that living things change overtime and will identify different ways that animals have adapted to suit their environment. They will appreciate how the work of Charles Darwin, Alfred Wallace and Mary Anning has changed our understanding of the world.

Key areas

- 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.

Key Vocabulary

inherited traits
inheritance
offspring
genes
DNA

adaptive traits
adaption
variation
evolution
natural selection
fossils
habitat
environment

Working Scientifically skills

S4 I can identify scientific evidence that has been used to support or refute ideas or arguments

Tips and tricks

Suggestions for Implementation

Look at various animals and investigate how they have adapted to their environment
Bring in photos of themselves/siblings/parents and notice similarities and differences between them
Examine the theories of evolution constructed by Darwin and Wallace.
Identify scientific evidence that has been used to support or refute ideas or arguments; Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago in the context of the evolution of plants, animals and humans.
Identify how adaptation may lead to evolution by examining the advantages and disadvantages of specific adaptations and the role of human intervention in the process of evolution.

Enrichment opportunities

DNA activities; paper origami helix, make DNA using jelly babies and cocktail sticks, extract fruit DNA
Make animation of evolution process
Visit Natural History Museum (Charles Darwin and evolution workshop/Nature Live talk/Investigate workshop)
Read DNA Detective books

Suggested questions to measure impact:

What does adaptation mean? How has this animal adapted to it's environment?

Why are offspring similar to their parents?

How did Charles Darwin/ Alfred Wallace/ Mary Anning change our understanding of the world?

Year 6 Spring 2 - Living things and their Habitats

Prior learning

Recap Year 1 learning: To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals, To identify and name a variety of common animals that are carnivores, herbivores and omnivores, To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)
Recap Year 2 learning: To 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.
Recap Year 4 learning: recognise that living things can be grouped in a variety of ways, To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment

Intent

Pupils will understand why it is important for scientists to have a system for classifying living things. They will understand that living organisms are classified into groups based on common characteristics. They will become more familiar with the vocabulary associated with Linnaean classification system.

Key areas

- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals
- Give reasons for classifying plants and animals based on specific characteristics

Key Vocabulary

Carl Linnaeus
Linnaean system
taxonomist
classification
characteristics
traits
Kingdom
Phylum
Class
Order
Family
Genus
Species
bacteria micro-organism

Working Scientifically skills

S4 I can identify scientific evidence that has been used to support or refute ideas or arguments

Tips and tricks

Suggestions for Implementation

Look at various animals and investigate their similarities and differences
Identify the characteristics of mammals, birds, insects, reptiles, amphibians, fish, arachnids, annelids, crustaceans, echinoderms and molluscs.
Give reasons for classifying plants and animals based on specific characteristics by exploring unusual creatures and designing their own curious creature.
Identify the characteristics of different types of micro-organisms.
Experiment using bread – what conditions does mould / fungus need to grow?
Create a field guide to the organisms found in the local habitat.

Enrichment opportunities

Visit Natural History Museum

Suggested questions to measure impact:

Why did Carl Linnaeus create his classification system?

What do all mammals/ birds/ fish/ reptiles/ amphibians/ insects/ crustaceans/ molluscs have in common?

What conditions does mould like to grow in?

Year 6 Summer 1 - Working Scientifically Skills

Prior learning

Recap Year 5 learning: Work Scientifically Skills – planning fair tests, identifying variables,, measuring, recording results, drawing simple conclusions and evaluating the reliability of results.

Intent

Pupils will further develop their Working Scientifically skills and will accurately use a wider range of scientific vocabulary. They will continue to make links to the use of Science in the real world and related careers.

Key areas

- Carry out scientifical investigations that focus on a Working Scientifically skill e.g. asking questions, planning and setting up experiments, observing and measuring, recording results, classifying and presenting data, drawing conclusions and evaluating the reliability of results.
- Name a variety of jobs which involve science.

Key Vocabulary

scientific investigation
fair test
independent variable
dependent variable
control variable
prediction
observe
measure
repeat readings
classify
evidence
conclusion
interpret
evaluate
reliability

Working Scientifically skills

S1 I can record data and results of increasing complexity using scatter graphs, bar and line graphs **S2** I can plan different types of scientific enquiries to answer questions, controlling variables where necessary **S3** I can 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
S4 I can take measurements, using a range of scientific equipment with increasing accuracy and precision, taking repeat readings when appropriate

Tips and tricks

Suggestions for Implementation

Use TAPS lesson plans and resources
https://pstt.org.uk/unique-resources/taps/
Each lesson should have an LO with one clear Working Scientifically focus

https://www.stem.org.uk/explorify

Research an important scientist

Enrichment opportunities

Visitor to school from various science backgrounds
Visitor to science based professions i.e dentists
Science projects competitions
https://imascientist.org.uk/stayathome/teachers/

Suggested questions to measure impact:

Key questions on TAPS plans

What variable will you change?

What variable will you measure?

What will be the most effective way to collect/present your results?

What conclusions can you draw from your results?

How reliable are your results? Could any other variables have affected your results?

Year 6 Summer 2 - Circulatory System

Prior learning

Recap Year 2 learning: To find out about and describe the basic needs of animals, including humans, for survival (water, food and air), To describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
Recap Year 3 learning: To identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Intent

Pupils will identify the main parts of the circulatory system and describe how nutrients, oxygen and water are transported around the body. They will be able to explain how lifestyle choices affect our bodies and will understand the importance of making healthy choices.

Key areas

- 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.

Key Vocabulary

circulatory system
heart
lungs
oxygenated deoxygenated
oxygen
carbon dioxide
blood vessels
veins arteries capillaries
pulse
transport
diet
exercise
drugs

Working Scientifically skills

S1 I can record data and results of increasing complexity using scatter graphs, bar and line graphs **S2** I can plan different types of scientific enquiries to answer questions, controlling variables where necessary **S3** I can 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
S4 I can take measurements, using a range of scientific equipment with increasing accuracy and precision, taking repeat readings when appropriate

Tips and tricks

Suggestions for Implementation

Play with model hearts

Complete exercise activities and track the impact on the body over time

Enrichment opportunities

Hands on Science (Heart Dissection workshop)
Police talk on drugs
Create model of blood

Suggested questions to measure impact:

What are the main parts of the circulatory system?

Name the blood vessels. How are they different?

How does blood/ oxygen travel around the body?

How can drugs/ diet/ exercise/ lifestyle impact the body? How will you make healthy lifestyle choices?

Useful websites and links

TAPS

On this website, you will find all the TAPS lessons and resources.

Lessons will need to be adapted to fit the needs of the children in your class.

Lesson focus on a skill from the wheel

Reachout CPD

On this website you will find short courses to top up your subject knowledge.

Explorify

On this website, you will find a range of activities to include in your lessons.

These activities can be used as hooks, starters and plenaries.