

Year 1 - Humans

- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense

We want our children to have a lifetime of health and wellness. In year one, we want our children to :

- have a greater awareness of their bodies—how they work, move, grow and change
- make choices that will help to keep their body healthy

Regular Activities:

PE / playtime — reinforce body parts. How do we feel before, during and after exercise? How do we keep safe and what equipment do we need to do this? The daily mile.

Snack time — reinforce healthy eating; hygiene; names of fruit/veg; part of the plant eaten; using your senses; where does it grow and what plant does it come from?

Weather watch (Geography) — wearing appropriate clothing and talking about what to wear.

Books to read:



By the end of year one children will be able to:

Talk about and describe their body.

Make comparisons between themselves and others.

Talk about their senses and how they use them everyday.

Talk about how they've changed during year one (history link). Measure themselves over the year and compare to other animals/buildings/vehicles (Maths).

Look after their own health e.g. brushing their teeth (the singing dentist), washing hands, drinking water, choosing appropriate clothing etc.

Vocabulary

Body parts — fingers, skin, eyes, nose, ear, tongue, skeleton, spine, skull.

Sense, touch, see, smell, taste, hear

Comparative vocabulary – bigger, smaller taller, shorter, longer, narrower, wider

Possible Curriculum Links

Art – Alberto Giacometti – sculptures. Self Portraits – Picasso, Hockney, Warhol.

Computing – Use IT to create pictures of people, record themselves and their changes over the year (termly).

Provision:

Role play areas e.g. doctors, hospital, kitchen, gym.

Experiences:

Yoga instructor, Visit Medical Centre, Cbeebies Dr Ranj
Get Well Soon, Visit Eureka

Year 1 – Humans Investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">• How have we changed as we have got older?• How will/have we changed over Year 1?	<ul style="list-style-type: none">• Can we identify everyone in our class by our fingerprints?• What other ways can we use to identify children in the class?	<ul style="list-style-type: none">• Big grabs – Do the children with biggest hands grab the most...?• Are our hands and feet all the same size?• Which hand/foot does our class use the most?• Do the people with the longest legs jump further?• Do taller people have longer arms? (Mr Mackintosh's Raincoat Factory problem)	<ul style="list-style-type: none">• What happens when we go to the dentist/opticians?• How much sleep do we need?• How do athletes train? Link to Mo Farrah book.	

Opportunities for Working Scientifically

- Observe, describe and compare ourselves.
- Sort ourselves.
- Ask questions about ourselves/humans.
- Measure ourselves and our teachers (standard and non-standard units).
- Record data on tables e.g. What is the most popular birth month in our class? What is our favourite fruit? Where is our favourite place to visit? Link to pattern seeking investigations.

Background Knowledge

Humans have key parts in common, but these vary from person to person. Humans (and other animals) find out about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body.

Year 1 – Animals

We want our children to develop a love of nature and a sense of caring for our planet. We want them to be inspired and awed by the natural world. In year one, we want our children to :

- Know that the world is full of varied and interesting species of animals.
- To have a love of, an interest in and a care for animals.

- Identify common animals, including fish, amphibians, reptiles, birds and mammals.
- Know which common animals are carnivores, which are herbivores and which are omnivores.
- Describe and compare the basic parts of common animals.

Regular Activities:

Tell me time – Put up a picture of an animal and ask the children to tell you about it.

What am I? – Give children clues (page from animal book) about an animal and children use the clues to guess which animal you are.

The art of noticing – Watch film clips and do “the art of noticing.”

Odd one out - explorify.wellcome.ac.uk

Same, same but different – compare animals – graphic organiser.

Show me – Give children measurements of animals and ask them to show you how big that is.

Find me – Find me something that is the same size, height or weight as...

Books to read:



By the end of year one children will be able to:

Talk about animals that they are interested in.

Talk about and describe different animals.

Talk about what animals eat.

Talk about where animals live.

Compare animals.

Talk about how they can look after animals/ our world.

Vocabulary

Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, talons, skin, hair, coat, paws, hooves, carnivore, herbivore, omnivore, mammal, reptile, amphibian, bird, fish, invertebrate, vertebrate, insect, backbone, spine, skeleton

Comparative vocabulary – bigger, smaller taller, shorter, longer, narrower, wider, heavier, lighter, quickest, fastest, slowest

Possible Curriculum Links

Art – sketches of animals, collage of animals (links to materials), printing, animals prints.

Geography – which continents do animals live in?

Where are the worlds seas/oceans? Which places do animals live in? Where animals travel to?

DT – Bird feeders.

Provision:

Role Play: Vets, Zoo

Experiences:

Vet visitor, Tropical World, Visit from bearded dragon, RSPCA, Dogs Trust, Askham Bryan, The Deep, Watch Octonauts, David Attenborough clips, Deadly 60

Year 1 – Animals Investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">• If we watch an animal for a few minutes, where does it go and how far does it move?• Spring watch – How have our animals changed?	<ul style="list-style-type: none">• How can we sort our animals?• We think that there are animals all around us: What lives in our trees? Does anything live in the grass? What lives in the hedge? What lives in soil?• What birds visit our school grounds?• What animals live in the sea?	<ul style="list-style-type: none">• Birds are coming to our bird table. Do different birds come at different times of day? Do they prefer different types of food? (Link RSPB Big Garden Bird Watch)• Do birds with the same beaks eat the same type of food?	<ul style="list-style-type: none">• How can we attract more birds in to our school grounds?• Which animals is the...?• Why are some animals endangered (in trouble)?	<ul style="list-style-type: none">• How does changing the colour of a feeder affect the number of birds visiting our bird table?

Opportunities for Working Scientifically

- Observe, describe and compare animals (consider application of English skills).
- Sort animals.
- Ask questions about animals.
- Measure animals (standard and non-standard units).
- Record data on tables e.g. What is our favourite animal? Animal measurements (wing span of birds).

Background Information

Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them.

Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals.

Year 1 – Plants

We want our children to develop a love of nature and a sense of caring for our planet. We want them to be inspired and awed by the natural world. In year one, we want our children to :

- Know that the world is full of varied and interesting plants.
- To have a love of, an interest in and a care for plants by **growing things throughout the year**

- Identify plants that are commonly found in gardens and in the wild.
- Identify common deciduous and evergreen trees.
- Name the different parts of common plants and trees.

Regular Activities:

Grow plants all year – indoor plants, outdoor plants, herbs, seeds, lettuce.

Tell me time – Put up a picture of a plant and ask the children to tell you about it.

What am I? – Give children clues (page from plant/animal book) about a plant and children use the clues to guess which plant you are.

The art of noticing – Go on a seasonal stroll and do “the art of noticing.”

Odd one out - explorify.wellcome.ac.uk

Show me – Give children measurements of plants and ask them to show you how big that is.

Find me – Find me something that is the same size, height or weight as...

Snack time — reinforce healthy eating; hygiene; names of fruit/veg; part of the plant eaten; using your senses; where does it grow and what plant does it come from?

Books to read:



By the end of year one children will be able to:

Talk about and notice plants throughout the year.

Talk about and describe different plants.

Talk about what plants we eat.

Talk about how to grow plants.

Compare plants.

Talk about how they can look after plants/ our world.

Vocabulary

Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud.

Names of trees in the local area.

Names of garden and wild flowering plants in the local area.

Possible Curriculum Links

Art – sketches of plants, rubbings, printing with leaves, collage.

Geography – where does our food come from? Where are our parks or green spaces in Bradford, UK?

DT – Sewing a flower. Cooking with grown ingredients

Provision:

Role Play: Garden Centre, Florist, Allotment, Fruit and veg stall

Experiences: Seasonal walks in local parks/gardens, visit to local allotments, visit to a garden centre, visit from gardener/parks department, talk to a chef, talk to a florist,

Year 1 – Plants Investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> Spring watch – How have our plants changed? Autumn watch – How have our plants changed? How do different trees change in the Spring, Summer, Autumn and Winter? How do plants change as they grow? (plant diary) Observe a bunch of daffodils and look at how they change over time. Observe the plants that we are growing over time. 	<ul style="list-style-type: none"> How can we sort our plants? What plants can we eat? We took lots of pictures of plants on our walk how can we identify them? We have collected lots of fallen leaves how can we sort them? All the seeds have fallen out their packets how can we sort them? We want to make fruit drinks out of citrus fruits how many different types are there:? 	<ul style="list-style-type: none"> We notice that our apples have 5 seeds do all apples have the same number of seeds? Do the biggest fruits have the most seeds? Do different trees change at different times? Do taller trees lose their leaves before other trees? Do all flowers have the same number of petals? (can stretch to odd and even) 	<ul style="list-style-type: none"> Which plant is the...? Do any plants grow without soil? How do plants survive in very wet or dry places? How do our plants get their food? Where does food come from? How do we get chocolate? How much bread does a field of wheat make? Which plants live in the pond/ lake/sea? 	<ul style="list-style-type: none"> Do we need to make sure we plant the seeds the right way up? How does changing the way we grow our plants make a difference to the way that they grow?

Opportunities for Working Scientifically

- Observe, describe and compare plants (consider application of English skills).
- Sort plants, leaves, flowers, seeds etc...
- Ask questions about plants.
- Measure plants (standard and non-standard units).
- Record data on tables e.g. What is our favourite plant, flower, herb, fruit, vegetable? Plant measurements.

Background Knowledge

Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring.

Year 1 – Everyday Materials

We want our children to appreciate the gifts that the Earth gives us, how and why they are used. We want our children to care for the Earth and be considerate consumers. In year one, we want our children to :

- Find out what things are made from
- Talk about how things are made
- Begin to recycle and put their litter in bins

- Tell the difference between an object and the material it is made from.
- Identify everyday materials, including wood, plastic, glass, metal, water and rock.
- Describe the simple properties of different everyday materials.
- Use the properties of everyday materials to compare and group them together.

Regular Activities:

Tell me time – Give the children an object and ask the children to tell you about it (encourage them to use all of their senses).

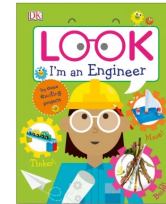
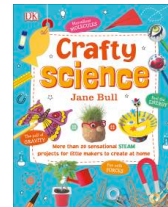
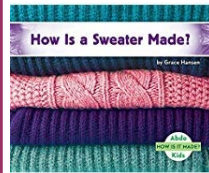
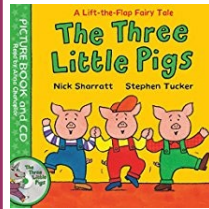
20 questions – Give children a selection of objects.

The art of noticing – Go on a texture walk and do “the art of noticing.”

Odd one out - explorify.wellcome.ac.uk

Tidy up time/Recycling time/Litter picking/Green leaders

Books to read:



By the end of year one children will be able to:

Talk about and notice objects throughout the year.

Talk about and describe different objects/materials.

Talk about the objects that we use.

Talk about how to make objects.

Compare objects.

Talk about how we look after our objects or belongings.

Vocabulary

Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through

Possible Curriculum Links

Art –collage of animals (links to materials), collage with plants, sculpture using clay.

DT – Sewing a flower, making a bird feeder, building structures out of different materials.

History – What are castles/ armour/ boats/ diving suits/ swim suits made of?

Provision:

Role Play: Castle, Kitchen, Construction area (with everyday objects), Junk Modelling, Den Building

Experiences: Local Walks, Watch Cbeebies - Do you know? Royal Armouries, Skipton Castle, The Deep, talk to carpenters, builders, dressmakers, knitters, artists, visit to ScrapMagic.in Shipley

Year 1 – Everyday Materials Investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> How do things change over time if we bury them in the ground? 	<ul style="list-style-type: none"> How can we sort our objects? Which clothes will keep us: cool, warm, dry on our trip? I have a parcel to send in the post how can we sort the packaging to find out which will keep my parcel safe and dry? Which objects are magnetic/non-magnetic? Which objects float/sink? 		<ul style="list-style-type: none"> How is ... made? (CBeebies Do you know?) 	<ul style="list-style-type: none"> How can you make a paper fish go further? There's a hole in my bucket what is the best material for mending it? What's the best material to wrap Humpty Dumpty in to stop him from breaking? Which is the best materials to mend my umbrella? Which are the stretchiest liquorice laces?

Opportunities for Working Scientifically

- Observe, describe and compare objects.
- Sort objects
- Ask questions about objects
- Record data on tables e.g. How much litter did we find in the playground? How many objects are made of out different materials?

Background Knowledge

All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons.

Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties.

Year 1 – Seasonal Change

We want our children to be aware of the world around them, how it changes and how this affects living things and the environment. In year one, we want our children to :

- Talk about the seasons and how they affect the world around them
- Talk about the weather

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

Regular Activities:

Monthly seasonal stroll around schoolgrounds/local park to notice the changes in plants, animals, weather, clothing we are wearing etc.

As part of your walk take photos, sketches etc. Gather objects from the park etc. Write 'Art of Noticing' poems; simple sentences etc.

Daily weather watch

Use BBC weather app to monitor the weather in the 4 capitals of the UK and Bradford. Talk about similarities and differences and why they might happen (link to N,S,E,W).

Encourage children to take turns to 'give the weather forecast'.

Playtimes

Encourage children to look at the weather and make decisions about what to wear. Talk about the weather if you are on duty!

Books to read:



By the end of year one children will be able to:

Name the seasons and the time of year associated with them.

Talk about and notice the seasons throughout the year.

Talk about and describe the seasons.

Talk about what we do to adapt to different seasons e.g. clothes, activities, physical environment, food

Talk about the plants and animals of different seasons and what they do.

Compare seasons.

Vocabulary

Weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn), sun, sunrise, sunset, day length, temperature, longer, shorter, darker, lighter, colder, warmer

Possible Curriculum Links

Geography – look at weather around UK and the world
Maths – record temperature each day; measure rainfall; record number of daylight hours;
Art – seasonal drawings, paintings, collages, photos.
ICT – Greenscreen weather forecasts

Provision:

Role Play: Weather station, Beach, Travel Agent, Winter landscape, Airport

Experiences:

Local Walks, watching the weather forecast, going outside to experience different weather

Year 1 – Seasonal Change Investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">How does the temperature change over the day, month, year?How does the weather affect what we eat and wear?Daily weather observations.	<ul style="list-style-type: none">Which objects/clothes would I use for the seasons?Which activities would I do in which season?It's getting dark. Which clothes are good to wear outside so that I can be seen?	<ul style="list-style-type: none">It's windy and rainy today. Is it always windy when it's raining?When is the wettest and windiest season?The litter collects in one corner of the playground. Does the wind always blow in that direction?	<ul style="list-style-type: none">Why do we have seasons?Why does it snow etc.Is the weather the same in other countries as it is in ours?How do I keep safe in the sun? Cold? Rain? Snow/ice?	<ul style="list-style-type: none">Which gloves will keep my hands dry in the rain/snow?

Opportunities for Working Scientifically

- Observe, describe and compare seasons.
- Sort objects into seasons.
- Ask questions about the seasons.
- Measure temperature, rainfall etc.
- Record data on tables e.g. rainfall, hours of daylight, type of weather, favourite season, favourite weather.

Background Information

In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again.

The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people.

Year 1 Humans

Real life scientists



Dr Ranj is a real doctor who helps poorly children.

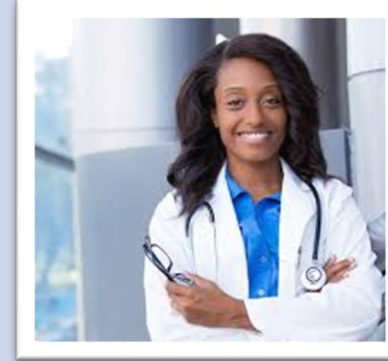


Dr Chris and Dr Xand are both doctors and studied medicine at Oxford University.



Florence Nightingale was a nurse in Victorian times. She began to organise and train nurses – something that hadn't been done before.

Careers in Science – Could you be a...?



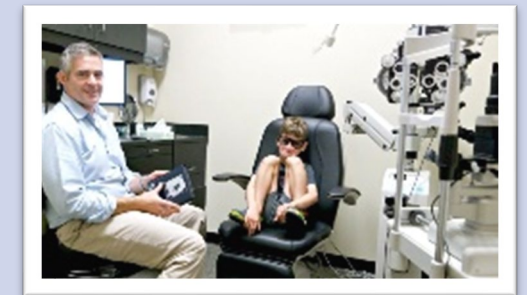
Doctor



Dentist



Nurse



Optician

Year 1 Animals

Real life scientists



Steve Backshall is a BAFTA-winning English naturalist best known for BBC TV's Deadly 60.



Jess French presenter for CBeebies and vet.

Careers in Science – Could you be a...?



Farmer



Vet



Dog walker



Zoo keeper

Year 1 Plants

Real life scientists -



The Rich Brothers studied landscape gardening at university and run their own garden design business.



Alan Titchmarsh is a professional gardener, journalist, TV presenter and author. He was born in Ilkley and started his career as a gardener for Bradford Council.



Beth Chatto - pioneering gardener won 10 successive gold medals at the Chelsea flower show.

Careers in Science – Could you be a...?



Gardener



Florist



Tree surgeon



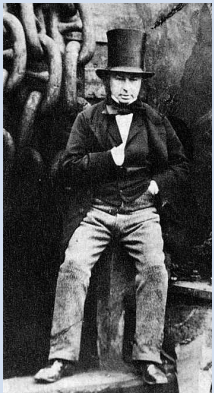
Park Keeper

Year 1 Everyday materials

Real life scientists



Maddie Moat is a TV presenter and film maker. She presents 'Do you know' on Cbeebies.



Ismbard Kingdom Brunel was a very famous Victorian engineer. He designed and built bridges, railways, ships, train stations and even a hospital.

Sabrina Cohen Hatton is the Chief Fire Officer of West Sussex Fire & Rescue Service.



Careers in Science – Could you be a...?



Firefighter



Chef



Mechanic



Tailor

Year 1 Seasonal change

Real life scientists



Paul Hudson is a Weather presenter on BBC. He was born and brought up in Keighley. He went to university to study physics.

Careers in Science – Could you be a...?



Weather forecaster (Meteorologist)

Year 2 - Humans

We want our children to have a lifetime of health and wellness. In year 2, we want our children to :

- Talk about how humans grow, live and survive
- Make choices that will help to keep their body healthy

- notice that humans have babies which grow into adults
- find out about and describe the basic needs of humans, for survival (water, food and air)
- describe the importance of exercise, eating the right amounts of different types of food and hygiene.

Regular Activities:

PE / playtime — reinforce body parts. How do we feel before, during and after exercise? How do we keep safe and what equipment do we need to do this? The daily mile.

Play time — healthy choices – fruit and milk.

Washing hands – before lunch and after going to the toilet.

Go Noodle

Wake up, Shake up

Mile a Day

Books to read:



By the end of year two children will be able to:

Talk about and describe how to look after themselves – what foods are best to eat; why we need to exercise; why and how to rest.

Make comparisons between themselves and people that are older and younger than them

Look after their own health e.g. brushing their teeth (the singing dentist), washing hands, drinking water, choosing appropriate clothing, appropriate activities, bedtimes etc.

Vocabulary

Offspring, growth, child, young/old stages exercise, heartbeat, breathing, hygiene, germs, disease, food types - meat, fish, vegetables, bread, rice, pasta.

Comparative vocabulary – bigger, smaller taller, shorter, longer, narrower, wider, healthy, unhealthy.

Possible Curriculum Links

PE – Body Coach

Geography – food and where it comes from, how people survive around the world and their home,

DT – tents, den building

Out door learning – forest schools, making fire

Provision:

Role play areas e.g. doctors, hospital, kitchen, gym, dentist

Experiences:

Yoga instructor, Visit Medical Centre, Cbeebies Dr Ranj Get Well Soon, Eureka, YouTube Singing Dentist, Bradford Bulls/Bradford City Players to visit, Visit from a doctor/dentist, Visit a gym

Year 2 – Humans Investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">• How do humans change from babies to adults?• How will/have we changed over Year 2?• How much water do I drink over the day? Week? Month?• How much coffee does my teacher drink over the day? Week? Month	<ul style="list-style-type: none">• How can we sort our foods?	<ul style="list-style-type: none">• The bigger the sneeze the further the spray. (Model with squeeze water bottle)• Are the oldest children in our class the tallest?• Are the oldest adults the tallest?	<ul style="list-style-type: none">• What are the healthiest ways of cooking our food?• What happens if we go without some food?• What happens if we have too much food?• What happens if we get too hot/too cold?• How long can we survive without food air water? (secondary research only – ha ha!)• How would you stay warm in the arctic?	

Opportunities for Working Scientifically

- Observe, describe and compare humans, types of exercise, before/during/after exercise, foods and drinks, shelter/homes, clothes.
- Sorting food, clothing, shelter.
- Ask questions about babies and adults, exercise, diet, hygiene etc.
- Measure ourselves and our teachers (standard/non-standard units).
- Record data on tables e.g. birthdays, heights, brothers/sisters, how many time you wash your hands, water/coffee drunk

Background Information

Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles.

All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise.

Year 2 - Animals

We want our children to be inspired and awed by the natural world. In year two, we want our children to :

- Talk about how to care for animals.
- Talk about how animals grow.

- notice that animals have offspring which grow into adults
- find out about and describe the basic needs of animals, for survival (water, food and air)

Regular Activities:

Tell me time - Animal of the day including its offspring.

Noticing baby animals that we see over the seasons.

Talking about children's pets.

Divide the children in to 2 groups – parents and offspring mix them up and find your baby. Link to Year 1 work and include reptiles, amphibians, fish, birds, mammals and invertebrates.

Top trumps cards - baby animals, dogs

Books to read:



By the end of year two children will be able to:

Talk about how to look after a pet.

Describe how animals help humans.

Talk about baby animals and their parents.

Describe how baby animals change as they grow.

Compare baby animals with their parents and other baby animals.

Vocabulary

Offspring, growth, young/old stages, breathing, survive, oxygen

Comparative vocabulary – bigger, smaller taller, shorter, longer, narrower, wider.

Possible Curriculum Links

PSHE – Looking after animals, kindness, empathy, responsibilities

Maths – how much time and money does it cost to keep a pet? How often do we have to feed/wash a pet?

English – Writing a pet owner's guide. Writing a letter to the Head teacher for a school pet.

Provision:

Role play areas e.g. pet shop, zoo, animal shelter,

Experiences:

Watch Spring watch, Dogs Trust, visit a pet shop, visit a zoo, talk to a vet, Visit Tropical World, Visit a farm in Spring

Year 2 – Animals Investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">• The frogspawn has turned into frogs. How do animals change from babies or eggs in to adults? E.g. frogs, chicks (consider incubating eggs)• Do different animals change and grow at different rates?• How has my pet changed over time?	<ul style="list-style-type: none">• Can you match the baby to their parent? Do this physically like a treasure hunt.• Can you match the pet equipment/food to the pet?	<ul style="list-style-type: none">• Can you spot any patterns in the life cycles of animals?	<ul style="list-style-type: none">• What is the school's favourite pet?• Which is the cutest baby animal?• How do I look after a...?• How many days can a...survive without food/water/air?	

Opportunities for Working Scientifically

- Observing, describing and comparing animals and their offspring.
- Observing, describing and comparing pets and their offspring.
- Sort animals, pet equipment etc... (see above)
- Ordering life cycles.
- Ordering pets by height, weight, easiest to keep. Measuring animals, babies, pets.
- Record information on tables and bar charts – children carry out surveys.

Background Information

Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles.

All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise.

Year 2 – Living Things and their Habitats

We want our children to be inspired and awed by the natural world. In year two, we want our children to :

- Talk about and describe the different places that animals and plants live in.
- Talk about what animals eat and who eats them!

- 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.

Regular Activities:

Tell me time – Animal/plant of the day in its habitat.

Who lives in a habitat like this? Habitat/animal/plant hunt.

Art of noticing – using short video clips from the BBC.

explorify.welcome.ac.uk – have a look at these resources.

Oddizzi - habitats

Books to read:



By the end of year two children will be able to:

Talk about and describe different habitats.

Explain how an animal is designed for its habitat.

Describe how animals and plants get what they need to survive from their habitat.

Order a simple food chain.

Say if something is living, dead or never been alive.

Vocabulary

Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland etc., names of micro-habitats e.g. under logs, in bushes

Possible Curriculum Links:

Art/DT – Junk modelling, animal with a moving part in its habitat. Create a diorama of an animal in its habitat.

Geography – link habitats to locational knowledge – including oceans. Mapping the habitats in our school grounds. Map a microhabitat.

Provision:

Small world different habitats,

Experiences:

Habitat walks in school grounds and local area, habitat workshop – environment explorer at Cliffe Castle, Who's coming to dinner workshop – Cliffe Castle, visit the woods – St Ives

Year 2 – Living Things and their Habitats Investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">• They've just cut the grass on the school field. How does it change as it starts to grow again?• How do habitats change over the year? Time-lapse videos.	<ul style="list-style-type: none">• We think there are animals all around us. What lives in our school grounds? in Horton Park? In our tall trees? In the hedge? In the soil? In our minibeast hotel?	<ul style="list-style-type: none">• Where do we found the most snails, spiders, worms, woodlouse?	<ul style="list-style-type: none">• How do plants survive in very wet or very dry places?• Do any plants grow without soil?• Why do animals migrate?	<ul style="list-style-type: none">• Can you design a home for a hedgehog/ minibeast? Resources on Explorify website.

Opportunities for Working Scientifically

- Observing, describing and comparing habitats.
- Sorting animals and plants in to their habitats.
- Plan how to collect data for the pattern seeking question.
- Explain where the different habitats are/what they are like/ how the animals and plants are designed to survive there. You could extend this to include environmental issues e.g. habitat loss, pollution and declining species.

Background Information

All objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers (This is a simplification, but appropriate for Year 2 children.)

An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil fuels).

Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants – shelter, food and water.

Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. These micro-habitats have different conditions e.g. light or dark, damp or dry.

These conditions affect which plants and animals live there. The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain their food from plants and other animals can be shown in a food chain.

Year 2 – Plants

We want our children to develop a love of nature and a sense of caring for our planet. We want them to be inspired and awed by the natural world. In year two, we want our children to :

- Know that the world is full of varied and interesting plants.
- To have a love of, an interest in and a care for plants by **growing things throughout the year**

- 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.

Regular Activities:

Grow plants all year – indoor plants, outdoor plants, herbs, seeds, lettuce.

Plant bulbs in Autumn 1 – ready for Spring. Plant bulbs in Spring 1 – ready for Summer. Plant bulbs in Summer – ready for when they return in Autumn.

Tell me time – Put up a picture of a seed/bulb and ask the children to tell you about it. Children to predict what they think it will grow in to and draw it.

What am I? Plant of the day – Give children clues (page from plant book) about a plant and children use the clues to guess which plant you are.

Odd one out - explorify.wellcome.ac.uk

Show me – Give children measurements of plants/seeds/bulbs and ask them to show you how big that is.

Find me – Find me something that is the same size, height or weight as...

Books to read:



By the end of year two children will be able to:

Say that there are two main groups of plants – those that produce flowers and those that don't.

Talk about how to grow a variety of plants.

Describe different seeds – what they look like, what they grow in to and how we use the plant.

Talk about how to grow a variety of bulbs.

Describe different bulbs – what they look like, what they grow in to and how we use the plant.

Talk about the parts of the plants we eat.

Vocabulary

Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, light, shade, sun, warm, cool, water, grow, healthy.

Names of trees in the local area.

Names of garden and wild flowering plants in the local area.

Possible Curriculum Links

Geography - Grow a cress world map.



Art – Create observational drawings of seed heads and seeds – Autumn



Pottery of seed heads



DT – Talk about how we use seeds in cooking.

Role Play: Children being gardeners, practical area where they can plant seeds and dig up plants – looking at them.

Experiences:

Make a salad that uses stems, leaves, seeds, bulbs, roots and flowers, plant throughout the year, interview Mrs Jackson – gardening club, visit an allotment, visit Harlow Carr RHS garden Harrogate – workshops. Watch 'Down on the Farm' Cbeebies.

Year 2 – Plants Investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">How do our seeds change as they germinate? (Timelapse)How long do our seeds take to germinate?How do our plants change as they grow?How long does it take us to grow a pumpkin for the Harvest festival? (plant in year 2 and eat it in year 3)	<ul style="list-style-type: none">All the seeds have fallen out of their packets. How can we sort them?Do different seeds grow in to different plants?All the bulbs in the garden centre are muddled up. How can we sort them out?	<ul style="list-style-type: none">Do taller plants grow from bigger seeds?We notice that our apples have 5 seeds do all apples have the same number of seeds?Do the biggest fruits have the most seeds?	<ul style="list-style-type: none">Which plants live in the pond/ lake/sea?Do any plants grow without soil?How do plants survive in very wet or dry places?How do our plants get their food?How much bread does a field of wheat make?How do we get chocolate?Do plants grow in the desert/polar regions?	<ul style="list-style-type: none">Keep the supermarket herb pots on your windowsill. How long can we keep them alive for? What happens if we don't water one of them? What would happen if we under/over water them? Etc...

Opportunities for Working Scientifically

- Observing, describing and comparing seeds/bulbs/plants/fruits
- Sorting seeds and bulbs as above.
- Order seeds e.g. smallest to largest. Order bulbs e.g. heaviest to lightest.
- Measure seeds/bulbs and plants.
- Explain how to grow and care for plants.
- Explain how plants help us to live.

Background Information

Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.

Year 2 – Materials

We want our children to appreciate the gifts that the Earth gives us, how and why they are used. We want our children to care for the Earth and be considerate consumers. In year two, we want our children to :

- Talk about what things are made from and why
- Making or using familiar objects from a variety of materials and working out which one is the most useful
E.g. a bag, plate, cup, fork etc.
- Begin to have an appreciation for engineering and product design.

- Identify and compare the suitability of everyday materials, including wood, metal, plastic, glass, rock, brick, 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.

Regular Activities:

Tell me time – Give the children an object and ask the children to tell you about it (encourage them to use all of their senses).

20 questions – Give children a selection of objects.

Odd one out, Zoom in zoom out, What if? -
explorify.wellcome.ac.uk

Tell me why time - Give the children an object and ask why it has the properties it does. E.g. why do your trainers have bumpy soles?

Books to read:



By the end of year two children will be able to:

Talk about and describe different objects/materials.

Talk about the properties of everyday objects that we use.

Talk about how they've made objects and things that went well or could be improved.

Which object is the most suitable for a task. E.g. Which one of these bags is best for carrying my marking home in?

Which material is the most suitable for an object. E.g. Which bag will protect my books from the rain?

Vocabulary

Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through, opaque, transparent and translucent, reflective, non-reflective, flexible, rigid, Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing. Bend/bending, stretch/stretching

Possible Curriculum Links

Art – sculpture using clay, mod-rock, wire, Plastercine

DT – Sewing a flower, cooking looking at the properties of the equipment, building structures out of different materials.

History – What were things made from in the past and how and why has it changed?

Provision:

Role Play: Kitchen, Construction area (with everyday objects), Junk Modelling, Den Building

Experiences:

Local Walks, Watch Cbeebies - Do you know? Industrial museum, local building sites, local play area, playground, talking to the caretaker about how they maintaining the building and what they have to do, visit from someone who uses materials E.g. Product Designer.

Year 2 – Materials Investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">How does the state of our school uniform change as we wear it everyday?How does my school bag change as I use it?	<ul style="list-style-type: none">We want to make an umbrella. There are lots of materials we can use to make it. How can we sort these materials to find out those that work and those that don't?I have a parcel to send in the post how can we sort the packaging to find out which will keep my parcel safe and dry?	<ul style="list-style-type: none">The thicker the material of the bag the more weight it can hold. E.g. paper bag, knitted bag, bag for life, leather bag, plastic bag.True, False or prove it – If I put a heavy weight on a lump of Plastecine it will squash it flatter.	<ul style="list-style-type: none">How is ... made? (CBeebies Do you know?)When was glass and plastic first used?How is Lego made?What does an engineer do?	<ul style="list-style-type: none">What's the best fabric for my bag?Which is the best materials for Cinderella's mop?Children to carry out consumer surveys. E.g. Which water bottle/packed lunch box would you recommend?

Opportunities for Working Scientifically

- Observe, describe and compare objects.
- Sort objects
- Ask scientific questions about objects and use information to answer them
- Plan how to collect data to answer questions – with help
- Measure
- Talk about what might happen and what did happen
- Plan a simple fair test – with help
- Test out their own/someone else's ideas
- Explain why
- Record information on tables and bar charts

Background Information

All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials.

Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness.

Year 2 Humans

Real life scientists

Joe Wicks – Fitness Coach



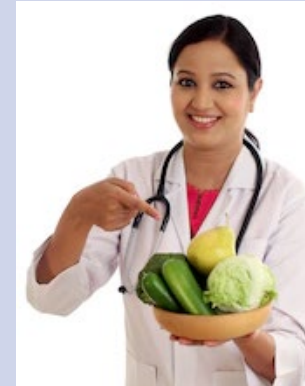
Bear Grylls – TV presenter, Adventurer, former soldier



Nicola Adams – Professional boxer



Careers in Science – Could you be a...?



Nutritionist



Fitness Instructor



Health Visitor



Paediatrician

Year 2 Animals

Real life scientists



David Attenborough is a naturalist.



Steve Irwin



David Lindo – Urban Birder - Birdwatching

Careers in Science – Could you be a...?



Zoologist



RSPCA Officer



Animal Nutritionist



Wildlife Photographer

Year 2 Living things & their habitats

Real life scientists

Chris Packham



Bill Oddie



Jimmy Doherty



Jane Goodall



Careers in Science – Could you be a...?



Forestry Commission



Young Ranger in a national park



Salmon Farmer



Town and Country Planner

Year 2 Properties of materials

Real life scientists



Sir James Dyson



Joelle Joanie "JoJo" Silva



Nick Park



Henry Moore



Cath Kidston

Careers in Science – Could you be a...?



Joiner



Engineer



Product Designer



Fashion Designer

Sculptor



Year 2 Plants

Real life scientists

Sports turf research (STRI Group at Bingley)



J B Gill



Careers in Science – Could you be a...?



Forester



Groundsperson for sports club

Farmer



Year 3 – Humans

We want our children to have a lifetime of health and wellness. In year 3, we want our children to :

- Talk about how the skeleton and muscles help their body, and how we can keep them strong
- Talk about how food affects our bodies and be able to make positive choices

- 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.

Regular Activities:

Odd one out – x-ray of animal skeletons explorify

P.E. – When in P.E. talk about the muscles and the parts of the skeleton we are using.

– Dancing in Science – STEM

How exercise affects our bodies

Daily mile

Tell me 3 nutritional things you had for dinner today

Permanent class bar graph where children can vote for the most nutritious food

Use the Change for Life food scanner to measure nutritional

Books to read:



By the end of year three children will be able to:

Talk about their skeleton and the job it does

Identify and name some bones in the human skeletal system

Talk about and identify the major muscles in the body. E.g. quads, hamstrings, calves, glutes, triceps, biceps

Talk about how the muscles work

Compare human and animal skeletons

Investigate the food we eat in a week, as a class

Explore how nutritious our current diet is and how we can improve it.

Vocabulary

Offspring, growth, child, young/old stages exercise, heartbeat, breathing, hygiene, germs, disease, quads, hamstrings, calves, glutes, triceps, biceps, skeleton, muscles, food types - meat, fish, vegetables, bread, rice, pasta, nutritious,

Comparative vocabulary – bigger, smaller taller, shorter, longer, narrower, wider, healthy, unhealthy.

Possible Curriculum Links

DT – cooking nutritious, savoury, plant based foods

ICT – scanning food

Maths – collecting data

Provision:

Wonder table - light box with x-rays, food and food scanner app

Experiences:

Watch Operation Ouch on CBBC

Interview a doctor, nurse, paramedic, personal trainer, physio,

Paralympian, nutritionist (www.nutritionist-resource.org.uk/county/west-yorkshire) etc.

Year 3 – Humans Investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">How do I change over year three? (making measurements of body parts)	<ul style="list-style-type: none">How can make a chart to show what different animals eat?The school are going on a residential to Nell Bank, the teachers want to make sure the meals are healthy and interesting. Can we sort food into a chart to decide what's best to take?	<ul style="list-style-type: none">Can the children with biggest hands grab the most cubes?The biggest man in the world has the biggest feet. Is there a pattern between height and foot size?Do the people with the longest legs jump the furthest?The older the child the bigger the hat?	<ul style="list-style-type: none">Is take away food bad for our health?Great British Space Dinner - STEM	<ul style="list-style-type: none">Sugar in drinks – how does it effect floating and sinking of can?Do people who exercise a lot have a larger lung capacity than people who don't?Do people who exercise a lot have better balance?

Opportunities for Working Scientifically

- Observe, describe and compare humans, types of exercise, before/during/after exercise, foods and drinks, shelter/homes, clothes.
- Sorting food, clothing, shelter.
- Ask questions about babies and adults, exercise, diet, hygiene etc.
- Measure ourselves and our teachers (standard/non-standard units).
- Record data on tables e.g. birthdays, heights, brothers/sisters, how many time you wash your hands, water/coffee drunk

Background Information

Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients. Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support.

Year 3 – Rocks

We want our children to appreciate the gifts that the Earth gives us, how and why they are used. We want our children to care for the Earth and be considerate consumers. In year three, we want our children to :

- Talk about how the Earth is constantly moving and reshaping itself & how rock formation is dynamic
- Talk about what geology is and why it's important.

- 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.

Regular Activities:

As we encounter historical buildings or artefacts throughout the year, remind children of the rocks they are made from

Odd one out, Zoom in zoom out, -
explorify.wellcome.ac.uk

Tell me why time - Give the children an object and ask why it has the properties it does. E.g. why do your trainers have bumpy soles?

Geographical events that may occur over the year.

Books to read:



By the end of year three children will be able to:

Name some famous rock formations around the world.

Describe how rocks are formed.

Explore the environment and identify things made from rocks. E.g. stone

Observe, describe and compare rocks.

Group and order rocks.

Explain why rocks have been used for a specific purpose. E.g. Marble for statues

Describe how fossils were formed.

Observe, describe and compare soils (When teaching plants talk about the correct soil type)

Vocabulary

Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil, longevity, sedimentary, igneous, metamorphic, permeable, impermeable, weathering, palaeontologist, geologist, decaying

Possible Curriculum Links

Art – look at famous sculptures and building made from rocks. When we use materials made of rocks remind children of where it was made.

History – Look at different artefacts made from rocks e.g. Stonehenge, Parthenon, flint axes from the Stone Age – look at geologist figures from history e.g. Mary Anning
Talk the properties of the artefacts and their longevity

Provision:

Have a collection of rocks and minerals and things that are made from rocks, a collection of fossils and samples of different soils.

Experiences:

Local Walks, Visit to Malham, Cliffe Castle at Keighley – rocks workshop and visit the mineral gallery. Visit Cartwright Hall/Lister Park to look at the sandstone building and the fossilised tree root in the park.

Year 3 – Rocks

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> How has the coastline of Britain changed over time? We can't read the words on the gravestones which are the hardest to read? Is it the oldest ones? How have they changed? 	<ul style="list-style-type: none"> How many ways can we sort the rocks? Jane is an architect who has to build a house in the Pennines, where it often rains. The house must not let the damp in. Which rock, from the sample she has sent you, would you recommend? 	<ul style="list-style-type: none"> Rock types have patterns e.g. layers, bubbles etc – link to sorting rocks 	<ul style="list-style-type: none"> What is Geology and why is it important? What is a Geologist? What is the difference between limestone, marble and chalk? How do we use rocks in our everyday lives? Where does salt come from? What is the difference between rocks, minerals and gems? What is the Mohs scale? 	<ul style="list-style-type: none"> Which rock is the hardest? Permeability test Suitability test – which rock is suitable for grave stone or a statue? What makes it suitable?

Opportunities for Working Scientifically

- Observe, describe and compare rocks/soils/fossils.
- Group and order rocks/soils/fossils.
- Ask scientific questions about rocks and use information/collect data to answer them.
- Plan how to collect data to answer questions – with help
- Measure – length and weight
- Plan a simple fair test – with help
- Test out their own/someone else's ideas
- Explain observations using cause and effect
- Record information on tables

Background Information

Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil.

Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.

Year 3 – Forces and Magnets

We want our children to understand that physics doesn't just happen in a lab, it happens around us all the time and affects everything from roller coasters to writing your name. In year 3 we want our children to:

- To say a force is a push or a pull and it can vary in size.
- To talk about how forces (including friction) affect how things move.
- To talk about magnets and magnetism
- To say that we cannot see a force we can only see the affect that it has on an object.

- 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..

Books to read:



By the end of year three children will be able to:

Explore forces in the environment E.g. playing with toys, kicking/throwing balls, opening doors, climbing.

Make observations on how we use forces in everyday life.

Describe forces and their effect on things

Spot and talk about simple patterns in our observations E.g. the harder the kick the further the ball went.

Measure forces using a force meter and record data in a table.

Investigate how things move on different surfaces

Observe and describe magnetic forces

Test objects to see if they are magnetic

Regular Activities:

Art of noticing – write a poem about forces as you see them happening around you.

As we are using forces in every day life mention them especially in P.E. e.g. javelin, swimming

When it's a windy day talk about the force of the wind. When it is icy or rainy talk about it being more slippery as there is less friction.

Vocabulary

Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole

Possible Curriculum Links

P.E. – jumping, throwing

D.T. – make a product that uses a magnet

ART – using magnetic paint to create pictures; using magnets, a metal object and paint to create a painting; creating a sculpture using magnets and metal objects

Provision:

Have a collection of magnets and objects to test them on. A collection of objects that require forces to move. E.g. zip, yoyo, buttons, push cars.

Experiences:

Go out into the playground/park, trampolining, bowling, swimming, iceskating, using a brush to sweep the playground.

Year 3 – Forces

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> Can you make a marble run that lasts for 30 seconds? 	<ul style="list-style-type: none"> Go on a walk around school noticing the pushes and pulls. Sort magnet and non magnetic items. 	<ul style="list-style-type: none"> The bigger the magnet the more paper clips it can hold. True/False/Prove it 	<ul style="list-style-type: none"> How do magnets work? How do we use magnets in everyday life? 	<ul style="list-style-type: none"> Which is the strongest magnet? What affects how far a toy car travels when it rolls down a ramp? Which shoe has the most grip? Which magnet is the best for our fridge? What makes a difference to how easy it is to move a block of stone?

Opportunities for Working Scientifically

- Observe, describe and compare rocks/soils/fossils.
- Group and order rocks/soils/fossils.
- Ask scientific questions about rocks and use information/collect data to answer them.
- Plan how to collect data to answer questions – with help
- Measure – length and weight
- Plan a simple fair test – with help
- Test out their own/someone else's ideas
- Explain observations using cause and effect
- Record information on tables

Background Information

A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes.

A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract.

For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts.

Year 3 – Plants

We want our children to develop a love of nature and a sense of caring for our planet. We want them to be inspired and awed by the natural world. In year 3, we want our children to :

- Talk about the variety of plants across the world
- Talk about the importance of plants to life on earth

- 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.

Regular Activities:

Grow plants (flowering and non-flowering) throughout the year in your classroom, at home and in the school grounds.

Go out in the school grounds and observe plants how they change over the seasons.

Refer to the things plants give us when they occur during the school day:

- the food we eat
- the materials around us
- plants that grow around us
- the clothes we wear.

Grow plants to support wildlife needed for pollination

Vocabulary

Air, light, water, nutrients, soil, seeds, plant, flower, fruit, nectar, ovary, ovule, petal, pollen, stigma, style, stamen, growth, roots, pollination, pollinators, spores, dispersal, fertiliser, fertilisation, flowering, non flowering, moss, evergreen, deciduous, carnivorous, fruits, nuts, berries, sunlight, female, male, insect, wind, absorb, anchor, climate, transport, leaves, wood, timber, fabrics

Books to read:



By the end of year three children will be able to:

Say that there are two main groups of plants (flowering and non-flowering) and give examples of both

Talk about the things that plants give us

Observe, describe and compare plants

Measure plants

Describe the functions of parts of a plant

Describe how a variety of plants need different things to live

Describe the life cycle of plants and the role of the flower

Art – observing flowers/plants and creating drawings, collages, prints, sculpture etc. Investigating artists who use plants to create/inspire their work e.g. Andy Goldsworthy, James Brunt, Georgia O’Keeffe, Van Gogh, Andy Warhol, Monet

DT – cooking using plants

Maths – measuring plants or parts of plants

Provision:

Grow house plants in the Classroom throughout the year.

Grow plants in the school grounds throughout the year.

Role play pollination.

Experiences:

Visit your local park, RHS Harlow Carr Gardens at Harrogate, take a walk in the countryside, visit the supermarket, visit the garden centre, watch Gardeners’ World, invite a bee-keeper to visit, watch David Attenborough clip (Life of Plants)

Year 3 – Plants

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> Observe a bunch of flowers from a bud to dying. How long do our seeds take to germinate? Which are the quickest plants to grow and eat? How do our collection of house plants change over time in year three. What is the function of a plant stem? (TAPS assessment) Can you grow a new carrot from an old carrot? 	<ul style="list-style-type: none"> Can you sort these plants into groups and explain why? 	<ul style="list-style-type: none"> Which plants grow on the shady side of the field? Do plants in the shade grow bigger leaves than plants that grow in bright conditions? Which fruit/veg freeze and defrost without being damaged? Is there a pattern? 	<ul style="list-style-type: none"> What do we use plants for? What do plants do to support life? Can we only grow new plants from seeds or are there other ways? E.g. taking cuttings, grafting 	<ul style="list-style-type: none"> How much water do plants need? (TAPS assessment)

Opportunities for Working Scientifically

- Observe, describe and compare plants
- Group and order observations of plants and flowers
- Ask scientific questions and use information/ collect data to answer them
- Measure plants in standard units
- Plan a fair test with help
- Explain observations using cause and effect
- Draw simple tables and bar charts to record observations/data.
- Talk about observations and begin to use scientific facts to explain them

Background Information

Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.

Year 3 – Light

We want our children to understand that Physics doesn't just happen in a lab, it happens around us all the time and affects how we can see the world around us.

In year 3 we want our children to:

- Talk about what light is and where it comes from
- Talk about how light affects us
- Talk about how light is used around the world e.g. in celebrations, to communicate, to help us see, to help plants grow etc.

- 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.

Regular Activities:

- Recording the sunrise and sunset times over the year (building on seasons Y1)
- Recording the position of sun over the day
- Talking about shadows on a sunny day
- Shadow play with the projector
- Talk about how we feel on a sunny day, dull day, dark day etc.

Vocabulary

Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous

Books to read:



By the end of year three children will be able to:

- Talk about how light helps us in everyday life
- Name some sources of light
- Talk about materials that reflect light and how this can be useful/not useful
- Talk about how dark is the absence of light
- Talk about how to protect our eyes from the sun and why this is important
- Explain how to make a variety of shadows e.g. vary size, clarity and shape

Possible Curriculum Links

RE – how light is used in religions

Art – colour mixing to produce different tones and shades; talking about how light is used in paintings; photography

Computing – manipulating images by altering the brightness, transparency etc.

Provision:

Light box and resources; torches and a screen for children to cast shadows onto; various objects/materials for children to test

Experiences:

<https://www.scienceandmediamuseum.org.uk/learning/light-it-science-show>

Spending time in the dark, sensory room etc.

Year 3 – Light

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> I think our classroom gets darker by lunchtime. How does the light level in our classroom change during the day? How do shadows change over the day? 	<ul style="list-style-type: none"> The nights are getting darker. Can we sort our clothes to help us decide which are good to wear outside in the dark? Which materials reflect light? Which materials make the best curtains? We've been making shadows and noticed that different things make different types of shadows. How can we sort things by the kind of shadows they make? 	<ul style="list-style-type: none"> The closer the light to the object the longer the shadow? True or false? Prove it! 	<ul style="list-style-type: none"> What are optical illusions? How can we produce them? How far does the brightest light shine? How do we see things? What is it like to be visually impaired? 	<ul style="list-style-type: none"> We want to put a star on the magician's wand for pantomime. Which material makes the best reflector? Which material will make the best blackout blinds/curtains? It's really sunny today. Which is the best suntan cream? (Can be tested on UV beads) How well do sunglasses block the light? Which type is best?

Opportunities for Working Scientifically

- Observe, describe and compare light sources
- Ask scientific questions and use information/ collect data to answer them
- Measure light in standard units using a datalogger or light metre app
- Plan a fair test with help
- Explain observations using cause and effect
- Draw simple tables and bar charts to record observations/data.
- Talk about observations and begin to use scientific facts to explain them

Background Information

We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective.

The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light.

Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface.

Year 3 Humans

Real life scientists

Dr Megan Rossi – Dietitian and Nutritionist



Joe Wicks – Fitness Coach



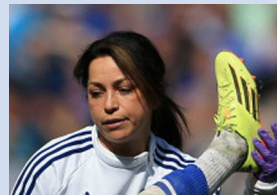
Robbie Thompson – Personal Trainer



James Baldwin – Head Physio, Man City



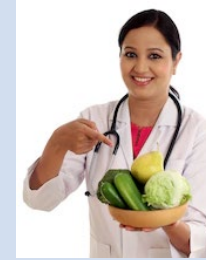
Eva Carneico – Chelsea team doctor



Charlotte Armah – Food scientist



Careers in Science – Could you be a...?



Nutritionist



Physiotherapist



Child Development



Personal trainer



Nurse



Sports scientist / therapist

Year 3 Rocks

Real life scientists



Harrison Schmitt –
geologist turned astronaut



Mary Anning – pioneer
fossil hunter



William and Mary Buckland
– early palaeontologists



Alexander Henry Green –
early geologist

Iain Stewart –
Geologist



Sanjeev Gupta – Professor
of Earth Science



Jack Horner –
Paleontologist



Careers in Science – Could you be a...?



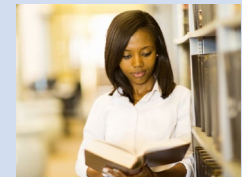
Geologist



Archaeologist



Palaeontologist



Historian



Volcanologist

Year 3 Forces & Magnets

Real life scientists



Torvill and Dean – ice dancers



Adam Peaty – Olympic swimmer



Paddy McGuinness
& Andrew Flintoff (Top Gear)



Carol Kirkwood – Weather
presenter

Keeley Donovan –
Weather presenter



Careers in Science – Could you be a...?



Radiographer



Jeweller



Meteorologist



Ice Hockey Player

Year 3 Plants

Real life scientists



James Wong – Ethnobotanist



David Attenborough



Isabella Tree –
Conservationist



Arit Anderson – Garden
designer



Helen Browning – Farmer & Chief
Executive of Soil Association



Ray Mears – woodsman,
author and TV presenter

Careers in Science – Could you be a...?



Botanist



Bee Keeper



Farmer



Horticulturist



Garden Designer



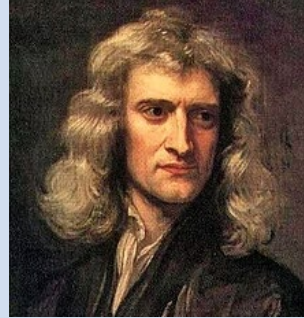
Woodsman

Year 3 Light

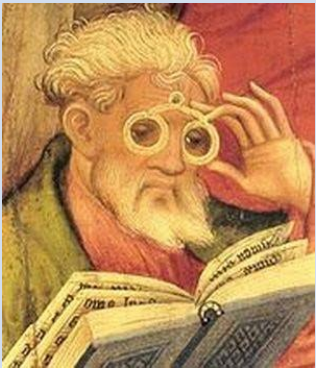
Real life scientists



Thomas Edison – inventor of the lightbulb



Isaac Newton – developed our modern understanding of light and colour



Salvino D'Armato – inventor of glasses



Benjamin Franklin – invented bifocal lenses

Careers in Science – Could you be a...?



Electrician



Optician

Optometrist and Ophthalmologist



Stage Production / Lighting Engineer



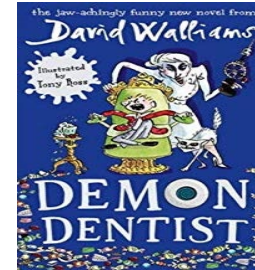
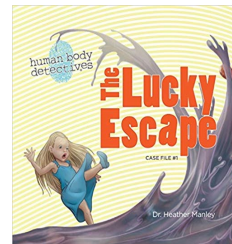
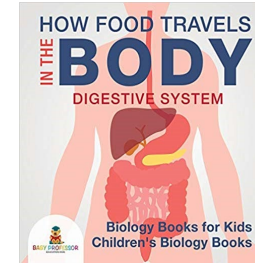
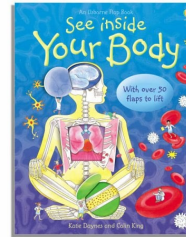
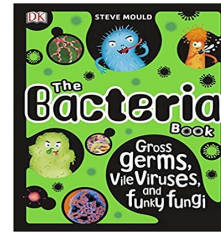
Year 4 – Humans

We want our children to have a lifetime of health and wellness. In year 4, we want our children to :

- be able to take care of their teeth by themselves and understand how their choices affect the quality of their teeth
- explain how their digestive system works and be able to take positive steps to keep it healthy

- 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

Books to read:



By the end of year 4 children will be able to:

- Talk about their teeth and how to care for them
- Describe the functions of the different types of teeth
- Explain how food/drinks can affect teeth
- Compare human teeth with those of other animals
- Identify and name the main parts of the digestive system
- Order the main parts of the digestive system
- Describe what happens in each part of the digestive system
- Explain how to keep their digestive system healthy

Regular Activities:

- As and when natural opportunities for eating arise e.g. making healthy choices - reinforce and revise children's' learning.
- When illness occur (if relevant) remind children about diet and hygiene.
- Brushing teeth every day.

Vocabulary

Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain

Possible Curriculum Links

PSHE – Health

Art and Design – make a 3D model of the digestive system.

Provision:

Having individual toothbrushes in class. Use disclosing tablets to see where plaque lies on the teeth.

Experiences:

Visit from school nurse or dentist.

Eureka from chew to poo exhibition.

Year 4 – Humans investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">How does an eggshell change when it is left in cola?	<ul style="list-style-type: none">What are the name of the organs involved in the digestive system?How can we organise teeth into groups?	<ul style="list-style-type: none">Are foods that are high in energy always high in sugar?	<ul style="list-style-type: none">Do humans and animals have the same number of teeth?How do dentists fix broken teeth?	<ul style="list-style-type: none">In our class, are omnivores taller than vegetarians?

Opportunities for Working Scientifically

- Observe, describe and compare temperatures and weather
- Group and order solids, liquids and gases.
- Ask scientific questions about solids, liquids and gases and use information/collect data to answer them.
- Plan how to collect data to answer questions – with help
- Measure – temperature
- Plan a simple fair test – with help
- Test out their own/someone else's ideas
- Explain observations using cause and effect
- Record information on tables

Background Information

Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added. The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet.

Humans have four types of teeth - incisors for cutting, canines for tearing, molars and premolars for grinding (chewing).

Living things can be classified as producers, predators and prey according to their place in the food chain.

Year 4 – States of Matter

We want our children to appreciate the gifts that the Earth gives us, how and why they are used. We want our children to care for the Earth and be considerate consumers. In year 4, we want our children to :

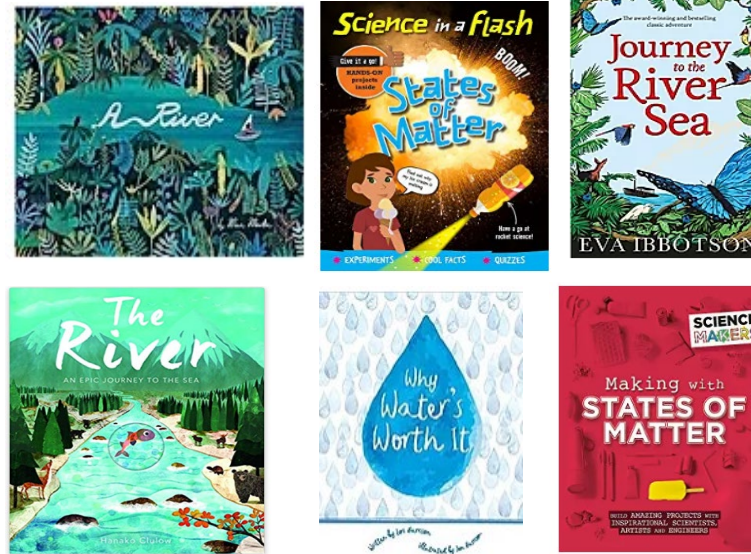
- Understand the basic building blocks of chemistry
- Understand that all the materials in the world come in three different forms – solids, liquids & gases

- 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 ($^{\circ}\text{C}$)
- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Books to read:

Regular Activities:

- Noticing and talking about naturally occurring examples of changing state e.g. a snowy day, a frosty car windscreen/ leaves, evaporating puddles.
- Link to everyday opportunities at home e.g. condensation in the shower, cooking, condensation on a drink can, steam from the kettle.
- Measure the temperature outside and discuss the weather.



By the end of year 4 children will be able to:

- Talk about solids, liquids and gases
- Describe the properties of solids, liquids and gases
- Describe what happens when objects melt, freeze or solidify
- Give everyday examples of melting and freezing
- Describe what happens when liquids evaporate and condenses
- Give everyday examples of evaporation and condensation
- Describe the water cycle
- Talk about temperature being how hot or cold something is
- Talk about how we measure temperature
- Measure temperature using a variety of thermometers

Vocabulary

Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle, condensation, thermometer, particles

Possible Curriculum Links

Geography – The Water Cycle

Computing – research

Writing – poetry on flowing, melting, freezing liquids

Art – Watercolours

Provision:

Thermometers in the classroom and outside to monitor temperatures and changes in weather.

Experiences:

Bolton Abbey – River Wharfe visit.

Yorkshire Water Education Centre

Year 4 – States of Matter investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> How does the appearance of snow change as it melt? How does the temperature of the snow change as it melts? How long does our snowball last? What happens if we sprinkle salt on it? 	<ul style="list-style-type: none"> Can you group a set of materials and objects into solids, liquids, and gases? 	<ul style="list-style-type: none"> I think little things take longer to melt. Is there a pattern in how long it takes different sized snowmen and ice lollies to melt? 	<ul style="list-style-type: none"> What's the purpose of insulation in the school? How are candles made? Some things change when they are heated. How do we make use of this? How does a thermometer work? How does a barometer work? 	<ul style="list-style-type: none"> At what temperature does chocolate melt? <ul style="list-style-type: none"> Types of chocolate Influence of where you leave the chocolate Does our washing dry faster on a sunny or windy day?

Opportunities for Working Scientifically

- Observe, describe and compare temperatures and weather
- Group and order solids, liquids and gases.
- Ask scientific questions about solids, liquids and gases and use information/collect data to answer them.
- Plan how to collect data to answer questions – with help
- Measure – temperature
- Plan a simple fair test – with help
- Test out their own/someone else's ideas
- Explain observations using cause and effect
- Record information on tables

Background Information

A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid.

Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0°C. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100°C. Evaporation is the same state change as boiling (liquid to gas) but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy.

Condensation is the change back from a gas to a liquid caused by cooling.

Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle.

Year 4 – Sound

We want our children to understand that Physics doesn't just happen in a lab, it happens around us all the time and affects everything that we hear. In year 4 we want our children to:

- talk about sound is used around the world e.g. communication, celebration, creativity
- talk about how sounds are produced by a variety of things e.g. human voice, instruments, machines, animals etc.
- talk about how to protect and look after their hearing

- 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.

Regular Activities:

- Listening to a variety of music throughout the year.
- Reinforce pitch, volume, instruments etc.
- Go a half termly sound walk.
- Use decibel metre throughout the year to monitor sound levels in the classroom.

Books to read:



By the end of year 4 children will be able to:

- Experience a variety of sounds around us, observe and describe them
- Order sounds in a variety of ways e.g. loudest to quietest, highest to lowest
- Compare sounds using words and decibels
- Explain how we use sounds in everyday life
- Consider how sounds help or hinder us
- Be able to explain how sounds travels
- Describe how volume and pitch are produced by a variety of simple instruments
- Describe how sounds get fainter as the distance from the sound source increases
- Explain how the ear works and how we can protect our hearing

Vocabulary

Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation, frequency, sound wave, protection

Possible Curriculum Links

Music – exploring different sounds instruments make

DT – Design and make an instrument and explore the different sounds

Provision:

Having a range of instruments in the classroom.

Experiences:

Go to a music concert, Wonderlab at the Science and Media Museum, Cbeebies Bedtime story told by Rob Delaney using Makaton.

Year 4 – Sound investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> When is it noisiest in our classroom? When is it quietest? When is it noisiest in the play area? When is it quietest? 	<ul style="list-style-type: none"> We've been on a sound walk. How can we sort out the different sounds that we heard? When the orchestra came into school, their different instruments make different sounds. Can we sort the school instruments by the sounds they make? 	<ul style="list-style-type: none"> The big tuba makes a deep sound. What patterns do we find when we look at musical instruments? I think it's always noisiest first thing in the morning. Is there a link between the amount of noise in school and time of day? Is there a link between the amount of noise and locations around the school? 	<ul style="list-style-type: none"> How do wind chimes work? How is sound measured? What is the loudest noise ever recorded? What can a dog hear that we can't? Who discovered that sound travels in waves? Can sound be heard in space? Do all animals have the same hearing range? 	<ul style="list-style-type: none"> How does the sound change if we put more water in the bottle? I think the sound gets deeper. How does changing the amount of water change the pitch? Does it matter if I blow and strike the bottle? How does changing the size of a musical instrument affect the pitch or loudness of the sound? What shape or material makes the best ear trumpet? Which is the best material for muffling sound? What's the best way to protect our ears from loud sounds?

Opportunities for Working Scientifically

- Observe, describe and compare sound levels in a variety of place.
- Group and order sounds according to pitch and volume.
- Ask scientific questions about sound and use information/collect data to answer them.
- Plan how to collect data to answer questions – with help
- Measure – pitch and volume
- Plan a simple fair test – with help
- Test out their own/someone else's ideas
- Explain observations using cause and effect
- Record information on tables

Background Information

A sound source produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.

The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively. Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.

Year 4 – Electricity

We want our children to understand that physics doesn't just happen in a lab, it happens around us all the time. In year 4 we want our children to:

- understand that electricity provides us with essential heat, light, warmth, sound and movement.
- have an appreciation of how electricity is produced both by fossil fuels and renewables
- have an understanding of how electricity gets to our sockets and how it is used
- be able to take action to conserve electricity and so help the planet.

- 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

Regular Activities:

- Get readings from smart meter for children to interpret.
- Appoint energy monitors throughout the year.
- Play regular quizzes about electricity e.g. What am I?
- Name 5 things that run on batteries.
- Name five things that use electricity to produce sound

Books to read:



By the end of year 4 children will be able to:

- Talk about objects that use electricity
- Talk about how electricity is used to produce heat, warmth, movement and light and give examples.
- Make an electrical circuit and name the components
- Control a circuit using a switch
- Identify and classify conductors and insulators
- Research how electricity is produced in a variety of ways

Vocabulary

Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol

Possible Curriculum Links

English – instructions, warning poster

DT- making something that needs a switch to work

Provision:

Hoops to create venn diagrams for sorting electrical items

Experiences:

Visit a power station, interview an electrician/electrical engineer

Year 4 – Electricity investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">How long does a battery light a torch for?	<ul style="list-style-type: none">We want a switch in our circuit. How can we sort out which things make good switches?We've had a power cut. Which things in the kitchen will still work?Can you group a set of electrical devices based on where the electricity comes from?	<ul style="list-style-type: none">This paper clip is magnetic and a good conductor of electricity. Are things that are magnetic always good conductors of electricity?Which room has the most electrical sockets in a house?	<ul style="list-style-type: none">How has electricity changed the way we live?How does a light bulb work?	<ul style="list-style-type: none">How does changing parts of our circuit affect brightness of the bulb?Which metal is the best conductor of electricity?

Opportunities for Working Scientifically

- Observe, describe and compare temperatures and weather
- Group and order solids, liquids and gases.
- Ask scientific questions about solids, liquids and gases and use information/collect data to answer them.
- Plan how to collect data to answer questions – with help
- Measure – temperature
- Plan a simple fair test – with help
- Test out their own/someone else's ideas
- Explain observations using cause and effect
- Record information on tables

Background Information

Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit the component will not work. A switch can be added to the circuit to turn the component on and off. Metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity.

Year 4 – Living things and their habitats

We want our children to be inspired and awed by the natural world. In year 4, we want our children to :

- appreciate the wonder and beauty to be found in the variety of living things on Earth
- explain how human activity and natural phenomena can damage environments and talk about the impact that this has
- take action to protect our planet

- 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

Regular Activities:

- Play enquiry and elimination games e.g. 20 questions, magic box, I'm thinking of, head band game.
- Regularly seeing and using keys.
- Opportunities for lots of sorting e.g. using animal and plant cards (but not into hoops)
- Using children to create a human/giant branching data base

Books to read:



By the end of year 4 children will be able to:

- Talk about and describe range of habitats and their plants & animals (building on from Y2 work)
- Compare animals and plants
- Ask and answer yes/no questions
- Identify plants and animals using a classification key
- Group animals & plants in a variety of ways and give reasons
- Construct classification keys to help others to identify animals & plants
- Give examples of how an environment has changed due to human impact or natural phenomena
- Talk about actions they could take to protect our planet

Vocabulary

Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate, vertebrate, amphibians, fish, reptiles, birds, mammals, invertebrates, flowering plants, non-flowering plants, population, litter, deforestation

Possible Curriculum Links

Geography – The Water Cycle
Computing – research
Writing – fact files about living things
Art – Watercolours or observation drawing
DT – Make bug hotels

Provision:

Observe animals in the environment and in bug hotels.

Experiences:

Yorkshire Wildlife Park, Tropical World (Leeds), visit to a local park, identify living things on a walk around the school grounds, Yorkshire Wildlife Park, Cannon Hall Farm, The Deep (Hull)

Living things and their habitats investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">How does the variety of invertebrates on the school field change over the year?	<ul style="list-style-type: none">Can you use classification keys to identify a group the animals?		<ul style="list-style-type: none">Why are people cutting down the rainforests and what effect does that have?	<ul style="list-style-type: none">How does the average temperature of the pond water change in each season? Or specific habitat area.

Opportunities for Working Scientifically

- Observe, describe and compare temperatures and weather
- Group and order solids, liquids and gases.
- Ask scientific questions about solids, liquids and gases and use information/collect data to answer them.
- Plan how to collect data to answer questions – with help
- Measure – temperature
- Plan a simple fair test – with help
- Test out their own/someone else's ideas
- Explain observations using cause and effect
- Record information on tables

Background Information

Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things.

Living things live in a habitat which provides an environment to which they are suited (year 2 learning). These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way i.e. positive human impact, such as setting up nature reserves or in a bad way i.e. negative human impact, such as littering. These environments also change with the seasons; different living things can be found in a habitat at different times of the year.

Year 4 Animals, including Humans

Real life scientists



Greta Thunberg



Mike Dilger – The One Show



Dian Fossey – primatologist



Doug Allan – wildlife photographer



Jacques Cousteau – ocean explorer



Jane Goodall – primatologist

Careers in Science – Could you be a...?



Ecologist



Veterinary Surgeon



Dog handler



Microbiologist



RSPCA Inspector



Wildlife camera operator

Year 4 States of matter

Real life scientists



Paul Hudson – Meteorologist



Monica Galetti – Chef



Bear Grylls – adventurer



Ben and Jerry – icecream makers

Careers in Science – Could you be a...?



Weather forecaster



Ecologist



Solar Engineer



Chef

Year 4 Sound

Real life scientists

Robert Boyle – experimented to see if sound travels through a vacuum



Guglielmo Marconi – inventor and electrical engineer known for his work on radio



Gareth Malone – choir master



Professor Dame Ann Dowling – international expert on aircraft noise reduction

Careers in Science – Could you be a...?



Foley Artist



Sound Engineer



Audiologist



Physicist

Year 4 Living things and their habitats

Real life scientists



Sir David Attenborough



Steve Irwin – wildlife expert



Carl Linnaeus – creator of the system of naming Animals



Professor Dame Jane Francis – Director of British Antarctic Survey

Careers in Science – Could you be a...?



Wild Life Photographer



Environmental Scientist



Wildlife Conservation



Environmental Engineer



Tourism and Conservation

Year 4 Electricity

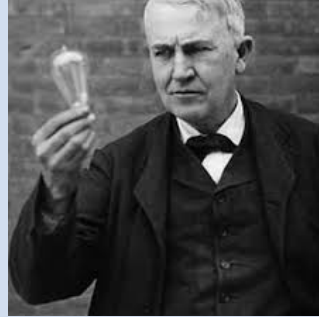
Real life scientists



Billy Byrne – DIY SOS



Michael Faraday –
discovered electromagnetic
induction

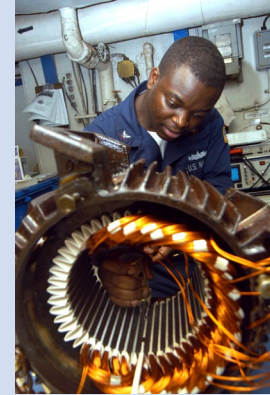


Thomas Edison – Inventor of
long-lasting light bulb



Frank Sprague – scientist who
developed the electric motor

Careers in Science – Could you be a...?



Electrician



Construction Manager



Lighting Manager



Electronic Engineer

Year 5 – Animals including Humans

We want our children to have a lifetime of health and wellness. In year 5, we want our children to:

- understand that taking care of their bodies and mind now will have an impact on their future.
- understand what it is like at various stages of life and have an empathy for others.

- describe the changes as humans develop to old age

Regular Activities:

- Regularly measure their height and the size of their feet over the year – How have they changed?
- Notice when they get new clothes – how are the sizes different?
- Talk to their parents about when they were a child – notice similarities and differences.
- If children link with another year group, they could do some fact finding about each other – comparisons, changes over the year etc.

Books to read:



By the end of year 5 children will be able to:

- Name and order the different stages of human life e.g. foetus, new-born, child, adolescent, adult, old age
- Work as part of a group to describe in detail one stage of the five listed above.
- Compare two or more stages (E.g. new-born and adolescent)
- Describe the changes of humans from birth to old age
- Explain strategies that people could use to support their mental wellbeing

The following may be covered during RSE or PSHE

- Explain the changes during puberty for boys
- Explain the changes during puberty for girls

Vocabulary

Puberty – the vocabulary to describe sexual characteristics

foetus, new-born, child, adolescent, adult, old age, death

Possible Curriculum Links

Art –

Maths – measuring and weighing

History – look at pictures of how a famous person has changed over the years e.g. the Queen

Provision:

Access to displays showing the life cycle

Access to buddies

Experiences:

Talk to new mothers and older people about their life experiences, what it's like to be their age.

Year 5 – Animals including Humans investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> Here are the photos of all of us all as babies. Don't we look different! How do we change as we get older? 	<ul style="list-style-type: none"> Can you identify the stages in the human lifecycle? 	<ul style="list-style-type: none"> Is there a relationship between diet, lifestyle, exercise and health? Are the oldest children in our school the tallest? What would humans look like if the head grew at the same rate as the body? 	<ul style="list-style-type: none"> Is life expectancy the same across the world? Why do we sweat? Why do people get grey/white hair when they get older? 	<ul style="list-style-type: none"> Who grows the fastest, girls or boys?

Opportunities for Working Scientifically

- Observe, describe and compare in careful detail
- Sort and classify with precise reasons
- Make predictions and explain why
- Plan how to collect evidence/information/data to test out an idea/prediction.
- Measure precisely in standard units
- Plan ways to test out their own/someone else's ideas
- Set up and carry out fair tests
- Draw tables, bar charts and simple line graphs to record observations/data
- Interpret and predict from bar charts and line graphs
- Explain observations/results using cause and effects and scientific facts and ideas
- Explain what the evidence show and whether it supports any predictions
- Identify trends and patterns in data and explain using scientific facts and ideas
- Communicate findings, evaluating the evidence as well as describing it
- Talk about how to improve their own work giving reasons

Background Information

When babies are young, they grow rapidly. They are very dependent on their parents. As they develop, they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce.

This needs to be taught alongside PSHE. The new statutory requirements for relationships and health education can be found below:

- statutory guidance on Physical health and mental wellbeing (primary and secondary).
- Other useful guidance includes:
- Joint briefing on teaching about puberty in KS2 from PHSE Association and Association for Science Education
- Briefing on human's development and reproduction in the Primary Curriculum from PHSE Association and Association for Science Education.

Year 5 – Living things and their habitats

We want our children to be inspired and awed by the natural world. In year 5 we want our children to:

- appreciate how life on earth reproduces
- explore how the farming, plant and food industry use plant reproduction to produce new varieties of plants etc.

Regular Activities:

- Have a garden area or planting box and grow flower and vegetables all year round
- Planting runner beans or sweet peas and observe how they grow
- Have a selection of plants in class for the children to look after and observe
- Monitor and record the life cycle of a frog or chick

Books to read:



- 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.

By the end of year 5 children will be able to:

- Describe the life cycles of a mammal
- Describe the life cycles of an amphibian
- Describe the life cycles of an insect
- Describe the life cycles of a bird
- Compare the life cycles of the above
- Review from year 3 parts of a plant, parts of a flower and the life cycle of a plant including pollination and seed dispersal
- Say that plants reproduce in 2 ways – asexual and sexual
- Give a simple explanation of sexual reproduction in plants and give examples of plants that reproduce this way.
- Talk about the two main groups of plants (flowering and non-flowering) and give examples of each
- Give a simple explanation of asexual reproduction in plants and give examples of plants that reproduce this way.

Vocabulary

Life cycle, reproduce, egg, live young, metamorphosis, asexual, sexual, plantlets, runners, bulbs, cuttings, pollination, seed dispersal, germinate

Possible Curriculum Links

ICT – Use plant apps to identify plants
DT – Making quadrants
Maths – Graphs, tables
Art – Observation drawings at each stage of the life cycle

Provision:

Garden area outside and plants to care for inside

Experiences:

Visit a nursery/garden centre, have living eggs or butterfly pupae, go pond dipping

Year 5 – Living things and their habitats investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> The frogspawn has turned into frogs. How do animals change from eggs or babies to adults? (e.g. cats, humans, frogs, butterflies, chick, sheep). What changes? (e.g. appearance, movement, sound, diet) Do different animals change and grow at different rates? 	<ul style="list-style-type: none"> Compare this collection of animals based on similarities and differences in their lifecycle. 	<ul style="list-style-type: none"> Are there any patterns in the life cycles of animals that live in different habitats? Do the largest animals have the longest gestation period? 	<ul style="list-style-type: none"> What attracts bees to our flowers? What are the differences between the life cycle of an insect and a mammal? Model seed dispersal methods – which method of seed dispersal is most effective? <ul style="list-style-type: none"> Do dandelions disperse seeds better/wider than daisies (quadrants on a field)? 	<ul style="list-style-type: none"> Which seed shape takes the longest time to fall?

Opportunities for Working Scientifically

- Observe, describe and compare life cycles in careful detail
- Sort and classify with precise reasons
- Make predictions and explain why
- Plan how to collect evidence/information/data to test out an idea/prediction.
- Measure precisely in standard units
- Plan ways to test out their own/someone else's ideas
- Set up and carry out fair tests
- Draw tables, bar charts and simple line graphs to record observations/data
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- Communicate findings, evaluating the evidence as well as describing it
- Talk about how to improve their own work giving reasons

Background Information

As part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis.

Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects.

Year 5 – Properties and change of materials

We want our children to appreciate the gifts that the Earth gives us, how and why they are used. We want our children to care for the Earth and be considerate consumers. In year 5, we want our children to :

- Continue to build their understanding of chemistry
- Understand that materials can be mixed together to produce new materials and sometimes they can be separated
- Appreciate that some of the earth's materials are finite and we need to be careful with how we consume them

Regular Activities:

- Investigation areas in class for children to explore – changed half termly
- Feely bags – what's inside?

Vocabulary

Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material

Books to read:



Possible Curriculum Links

D.T. – Cooking

Art – clay, painting

- 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

By the end of year 5 children will be able to:

Carousel of activities to recap previous learning as follows:

- Describe the properties of objects
- Compare and group everyday objects based on their properties
- Group together materials that are magnetic & non-magnetic (recap Y3)
- Group together materials that are electrical conductors/insulators
- Order materials from transparent to opaque
- Order materials from softest to hardest
- Compare the same object made of different materials e.g. water bottle and say which one is best for a given user.
- Explain which material is most suitable for a given purpose drawing on wider knowledge (every day and scientific).
- Talk about the changes of state; solids, liquids, gases
- Explain how materials can be recovered through evaporation

Year 5 – Properties and change of materials - continued

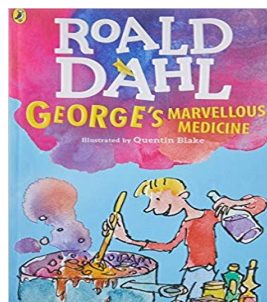
We want our children to appreciate the gifts that the Earth gives us, how and why they are used. We want our children to care for the Earth and be considerate consumers. In year 5, we want our children to :

- Continue to build their understanding of chemistry
- Understand that materials can be mixed together to produce new materials and sometimes they can be separated
- Appreciate that some of the earth's materials are finite and we need to be careful with how we consume them

Regular Activities:

See previous page

Books to read:



- 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

By the end of year 5 children will be able to:

New learning

- Explain what thermal conductivity is and which materials provide insulation
- Describe what a solution is
- Describe what a mixture is
- Explain the difference between soluble and insoluble.
- Explain what dissolving means and give examples of materials which dissolve
- Explain what filtering and sieving are and give examples
- Explain how materials can be recovered from solutions or mixtures through evaporation, filtering and sieving.
- Give examples of reversible and non-reversible changes

Vocabulary

Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material

Possible Curriculum Links

See previous page

Provision:

Experiences:

Year 5 – Properties and change of materials investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> When we heat chocolate it melts. How does an egg change when we boil or scramble it? Or cheese when it is heated? Or bread when we toast it? Or popcorn when we heat it? How does a sugar cube change as it is put in a glass of water? If we dissolve salt in water, can we get it back by evaporating the water? Does it work for other solids? How about sugar or flour? 	<ul style="list-style-type: none"> Can you group a set of materials based on whether they are transparent or not? Can you group a set of materials based on whether they dissolve or not? Can you group a set of materials based on whether they are reversible or irreversible after change (like heating or cooling)? 	<ul style="list-style-type: none"> Do all stretchy materials stretch in the same way? Can sugar and salt both be recovered from a solution? Does the temperature of water affect how a solid dissolves? 	<ul style="list-style-type: none"> Can any natural materials be used raw or do they all need processing in some way? What are microplastics and why are they harming the planet? How can seawater be made more drinkable? 	<ul style="list-style-type: none"> We're making some bubble mixture. What happens if we change any of the ingredients in this recipe? How does changing the mixture affect how long our bubbles last? Will the size of the eggs I use in my cake affect the size (rise) of my cake?

Opportunities for Working Scientifically

- Observe, describe and compare in careful detail
- Sort and classify with precise reasons
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- Plan how to collect evidence/information/data to test out an idea/prediction.
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- Talk about how to improve their own work giving reasons

Background Information

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.

Year 5 – Earth and Space

We want our children to appreciate the vastness of space and our place in it. In year 5 we want our children to know:

- The main parts of our solar system and how they affect us.
- That scientists are discovering new things about space all the time
- How our thinking about earth and space has changed over time

- 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
- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object (From forces)

Regular Activities:

- Watch live views of Earth from the International Space Station
- Follow NASA on Twitter
- Google Earth – track how other countries have different times of the day to us. E.g. it's lunchtime in England what time of the day is it in Indonesia?

Books to read:



By the end of year 5 children will be able to:

- Name and describe the sun and the planets
- Say that the earth, sun and moon are spherical bodies
- Use a model to explain day and night
- Say that the sun does not move, and it doesn't rise or set. It is the earth's rotation that gives us the impression of a sunrise and sunset.
- Use a model to explain seasons
- Use a model to explain how the earth and moon orbit the sun
- Explain the phases of the moon
- Talk about weightlessness in space and the pull of gravity on earth
- Describe how scientist's thinking about space has changed over hundreds of years

Vocabulary

Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets, Milky Way, galaxy, satellite, axis

Possible Curriculum Links

DT: Making a 3D model of a solar system

DT: Design a sun dial

ICT: Using the computer to view Earth from the International Space Station

Provision:

Globe, model of the solar system, access to a laptop/net book

Experiences:

Planetarium, Keighley Star Centre

Wonderlab

Year 5 – Earth and Space investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> The moon has changed from a disc to a crescent shape. How does the Moon's appearance change over a month? How do the positions of the stars in the sky change? 	<ul style="list-style-type: none"> We're going to do some night sky watching. Can we make a key to help us identify which planet is which? Can we do the same for the planet's satellites? How can we tell which constellation is which in the sky? How could you organise all the objects in the solar system into groups? Can you observe and identify all the phases in the cycle of the Moon? 	<ul style="list-style-type: none"> The Earth takes about 365 days to go round the sun. Does every planet take the same amount of time to go round the sun? Is there a pattern between the size of the planet and the time it takes? Is there a pattern between the distance the planet is from the sun and the time it takes? There was an earthquake in Japan. Do some places have more earthquakes than others? Are the earthquakes stronger in some places than others? What is the pattern in the time of day at different places on earth? 	<ul style="list-style-type: none"> Why does the moon's appearance change? What is a lunar eclipse? What is a star? How does a telescope work? What do astronomers do? How has scientist's model of the solar system changed over the centuries? What do we think would happen if the earth started to rotate more slowly? Model phases of the moon with Jaffa cakes 	<ul style="list-style-type: none"> How does the length of daylight hours change in each season?

Opportunities for Working Scientifically

- Observe, describe and compare in careful detail
- Sort and classify with precise reasons
- Make predictions and explain why
- Plan how to collect evidence/information/data to test out an idea/prediction.
- Measure precisely in standard units
- Plan ways to test out their own/someone else's ideas
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Background Information

The Sun is a star. It is at the center of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits. Earth takes 365¼ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates, the Sun appears to move across the sky. The Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun, Earth and Moon are approximately spherical.

Year 5 – Forces

We want our children to understand that physics doesn't just happen in a lab, it happens around us all the time and affects everything from rollercoasters to writing your name. In year 5 we want our children to:

- Talk about how forces affect the world around them and how we can use forces to help us

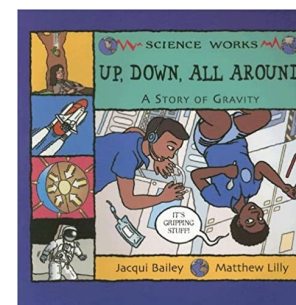
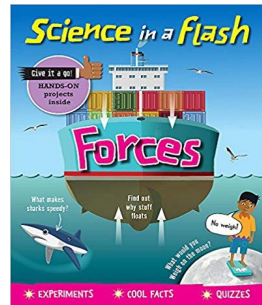
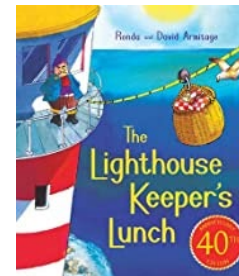
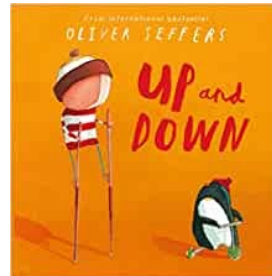
Regular Activities:

- Think about the actions we use when doing a physical activity e.g. climbing on climbing frames, running, writing.
- Year 5 – go swimming every week.
- Make paper aeroplanes – how can we make them more streamlined?
- Riding our bikes – think about the gears and how they work.
- Playing on scooters/rollerskates at playtime.

Vocabulary

Force, gravity, Earth, air resistance, water resistance, friction, surface resistance, mechanisms, simple, machines, levers, pulleys, gears

Books to read:



- 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

By the end of year 5 children will be able to:

- Say that a force is a push or a pull
- Say that forces come in different sizes
- Say how forces affect an object
- Say what gravity is and how it affects things on earth
- Measure forces using a force meter
- Plan fair tests that investigate water resistance, air resistance and friction
- Use diagrams to explain water resistance
- Use diagrams to explain air resistance
- Use diagrams to explain friction
- Give examples of when it is useful to have high water resistance, air resistance and friction
- To explore how levers, pulleys and gears work
- To say that levers, pulleys and gears are simple machines
- To explain how each of these simple machines work by taking a force and making it bigger
- Give examples of where these machines are used in everyday life

Provision:

Bikes, scooter, outdoor provision – skipping ropes, balls
Levers and pulleys to investigate

Experiences:

Funzy – trampoline centre in Bradford, iceskating

Possible Curriculum Links

P.E. – swimming

PSHE – Cycling proficiency

D.T. – Make a 3D model using gears, levers and pulleys.

P.E. Bat and ball games,

Year 5 – Forces Investigations

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none"> Our sponge is lower in the water than in was. What happens to other things when we put them on top of the water? Let's look at things moving. What happens to different types of rubbish when the wind blows? 	<ul style="list-style-type: none"> We've been on a push/pull walk round school and taken photos of things we push or pull. How can we sort all the pushes and pulls we noticed on our walk round school? Can you label and name the forces acting on a set of objects in different situations? 	<ul style="list-style-type: none"> How many turns of the clockwork key are needed to make our toy car go 1 metre, 2 metres, etc. Is there a pattern? The little flower floated slowly. Do all feathers fall in the same way? What about cupcake cases? Do all objects fall through water in the same way? 	<ul style="list-style-type: none"> What are different types of bridge called? Which are the strongest? Why don't cranes fall over? How did the Egyptians move the heavy rocks to build the pyramids? How do submarines work? How does a hot air balloon fly? When is a helicopter more useful than an aeroplane? Why? 	<ul style="list-style-type: none"> How does changing a parachute affect how our toy figures fall? What makes a difference to how far our balloon rocket can go?

Opportunities for Working Scientifically

- Observe, describe and compare in careful detail
- Sort and classify with precise reasons
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- Talk about how to improve their own work giving reasons

Background Information

A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.

Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object.

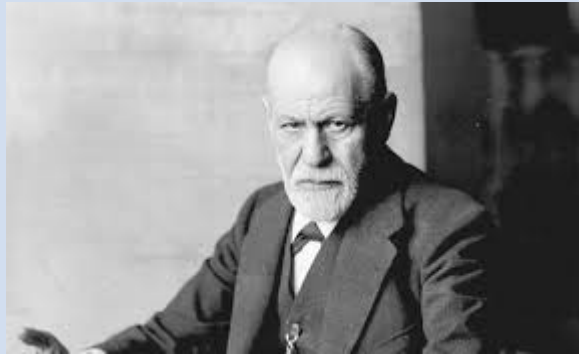
A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines.

Year 5 Animals, including Humans

Real life scientists



David Lindo – The Urban Birder



Sigmund Freud – the founding father of psychoanalysis, a method for treating mental illness

Careers in Science – Could you be a...?



Midwife



Paediatrician



Physiotherapist



Sport Scientist

Year 5 Living things and their habitats

Real life scientists



Steve Backshall – naturalist and explorer



Chris Packham – naturalist



Alan Titchmarsh – gardener



Adam Henson – farmer and author

Careers in Science – Could you be a...?



Forester



Conservationist



Biologist



Garden Designer

Year 5 Properties and changes of materials

Real life scientists

Careers in Science – Could you be a...?



Biochemist



Geologist

Year 5 Earth and space

Real life scientists



Major Tim Peake



Helen Sharman (OBE)



Mae Jameson



Professor Brian Cox

Careers in Science – Could you be a...?



Astronaut



Aerospace Engineer



Computer Hardware Engineer

Year 5 Forces

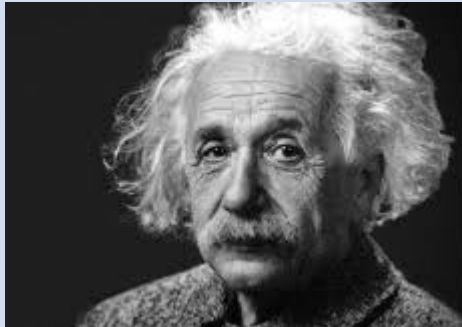
Real life scientists



Galileo Galilei – astronomer, physicist and engineer



Isaac Newton – mathematician, physicist and astronomer



Albert Einstein – physicist

Careers in Science – Could you be a...?



Pilot



Mechanical Engineer



Marine Engineer