



Science Curriculum

Science Overview

		Term		
		Autumn 1	Autumn 2	Spring 1
Yellow Class	Animals inc. Humans: Human Focus		Seasonal Change 	Plants 
	Spring 2	Summer 1	Summer 2	
	Everyday Materials	Animals inc. Humans: Animal Focus	Seasonal Change	
	MAGNETIC & NON-MAGNETIC MATERIALS CLIP ART 			

Science Overview

		Term				
		Autumn 1	Autumn 2	Spring 1		
Green Class	Animals inc. Humans: Animal Focus (Year 1&2)		Living things and their habitats (Year 2)		Everyday Materials (Year 1&2)	<p>MAGNETIC & NON-MAGNETIC MATERIALS CLIP ART</p> 
	Seasonal Change (Year 1)		Animals inc. Humans: Human Focus (Year 1&2)		Plants (Year 1 & 2)	
	Spring 2		Summer 1		Summer 2	
	Spring 1		Autumn 2		Autumn 1	

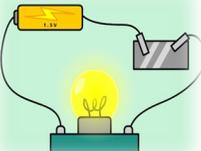
Science Overview

		Term		
		Autumn 1	Autumn 2	Spring 1
Blue Class	Living things and their habitats: Animals Focus (Year 2) 	Living things and their habitats: Plant Focus (Year 2) 	Animals inc. Humans: Human Focus (Year 2) 	
	Spring 2 Everyday Materials (Year 2) <small>MAGNETIC & NON-MAGNETIC MATERIALS CLIP ART</small> 	Summer 1 Animals inc. Humans: Animal Focus (Year 2) 	Summer 2 Plants (Year 2) 	

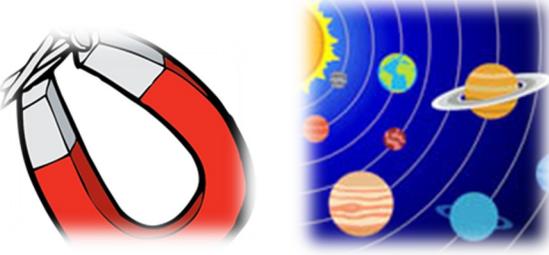
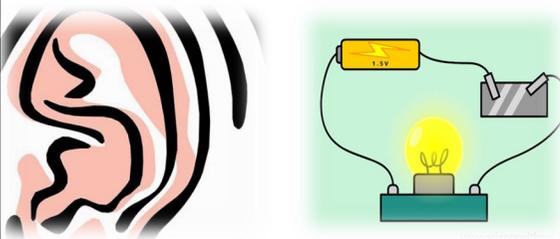
Science Overview

	Term		
Orange Class	Autumn 1 & 2	Spring 1	
	Rocks (Year 3) 	Forces and Magnets Year 3 	
	Spring 2	Summer 1	Summer 2
	Plants (Year 3) 	Light (Year 3) 	Animals inc. Humans (Year 3) 

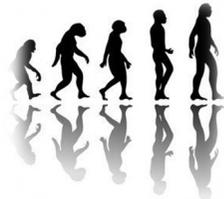
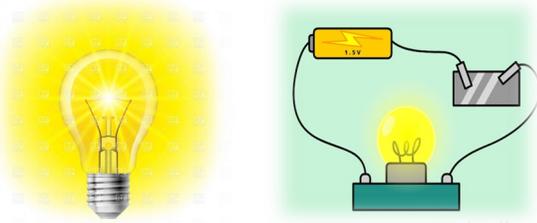
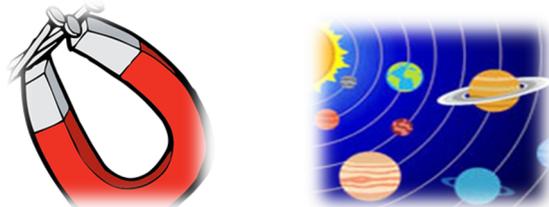
Science Overview

		Term		
		Autumn 1	Autumn 2	Spring 1
Lime Class	<p>Animals inc. Humans (Year 4 and Year 3 short)</p> 	<p>Electricity (Year 4) Light (Year 3 short)</p>  	<p>Living things and their habitats (Year 4)</p> 	
	<p>Rocks (Year 3 short) States of Matter (Year 4)</p> 	<p>Sound (Year 4)</p> 	<p>Plants (Year 3 short) Forces and Magnets (Year 3 short)</p> 	
		Spring 2	Summer 1	Summer 2

Science Overview

		Term		
		Autumn 1	Autumn 2	Spring 1
Lilac Class	Forces and magnets (Year 5) Earth and Space (Year 5)		Properties and changes of materials (Year 5)	Living things and their habitats (Year 4)
	Spring 2	Summer 1	Summer 2	
	States of matter (Year 4 short)	Sound (Year 4 short) Electricity (Year 4 short)	Animals inc. Humans (Year 5 & Short Year 4)	
				

Science Overview

		Term		
		Autumn 1	Autumn 2	Spring 1
Turquoise Class	<p>Animals inc. Humans (Yr6 and short 5)</p> 	<p>Evolution and inheritance (Year 6)</p> 	<p>Properties and changes of materials (Year 5 short)</p> 	
	Spring 2	Summer 1	Summer 2	
	<p>Light (Year 6) Electricity (Year 6)</p> 	<p>Forces and Magnets (Year 5 Short) Earth and Space (Year 5 Short)</p> 	<p>Living things and their habitats (Year 6 and short 5)</p> 	

Science Overview

		Term	
		Autumn	Spring
Purple Class		<p><u>Biology Revision Units:</u></p> <p>Plants</p> <p>Living things and habitat</p> <p>Animals inc. Humans</p> <p>Evolution and inheritance</p>  	<p><u>Physics Revision Units:</u></p> <p>Light</p> <p>Electricity</p> <p>Sound</p> <p>Forces</p> <p>Earth and space</p>  
		<p>Summer</p> <p><u>Chemistry Revision Units:</u></p> <p>Rocks</p> <p>States of Matter</p> <p>Properties and Changes of Materials</p>  	

Yellow Class - Working Scientifically Throughout

Key Knowledge, Skills and Understanding

Year 1 Expectations:

Children can ask simple questions and recognise that they can be answered in different ways.

Children can observe closely, using simple equipment.

Children can perform simple tests.

Children can identify and classify

Children can use observations and ideas to suggest answers to questions.





Yellow Class - Autumn 1



Unit

Animals inc. Humans: Human Focus

Progression of Knowledge, Skills and Understanding

Reception Expectations:

Children can make observations of animals and plants and explain why some things occur, and talk about changes.

Year 1 Expectations:

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

Observing over time	How does my height change over the year?
Pattern seeking	Do you get better at smelling as you get older?
Research	
Identifying & classifying	
Comparative tests	Is our sense of smell better when we can't see?
Fair Tests	



Yellow Class - Autumn 2



Unit

Seasonal Change

Progression of Knowledge, Skills and Understanding

Reception Expectations:

Children can look closely at similarities, differences, patterns and change.

Children can talk about the features of my own immediate

Year 1 Expectations:

Children can observe changes across the four seasons.

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

Observing over time	How light is our classroom at different times of the day and different times of the term?
Pattern seeking	Do trees with bigger leaves lose their leaves first in Autumn?
Research	
Identifying & classifying	How would you group these things based on which season you are most likely to see them in?
Comparative tests	In which season does it rain the most?
Fair Tests	



Yellow Class - Spring 1



Unit

Plants

Progression of Knowledge, Skills and Understanding

Reception Expectations:

Children can make observations of animals and plants and explain why some things occur, and talk about changes.

Year 1 Expectations:

Children can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.

Children can identify and describe the basic structure of a variety of common flowering plants, including trees.

Observing over time	How does my sunflower change each week?
Pattern seeking	Is there a pattern in where we find weeds growing in the school grounds?
Research	
Identifying & classifying	How can we sort the leaves that we collected on our walk?
Comparative tests	Which type of compost grows the tallest sunflower?
Fair Tests	Where will my sunflower grow the best?



Yellow Class - Spring 2

Unit

Everyday Materials

Progression of Knowledge, Skills and Understanding

Reception Expectations:

Children can talk about similarities and differences in relation to places, objects, materials and living things.

Year 1 Expectations:

Children can distinguish between an object and the material from which it is made.

Children can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.

Children can describe the simple physical properties of a variety of everyday materials.

Children can compare and group together a variety of everyday materials on the basis of their simple physical properties.

Observing over time	What happens to shaving foam over time?
Pattern seeking	
Research	Which materials can be recycled?
Identifying & classifying	Making an umbrella – which materials are waterproof?
Comparative tests	Which materials are the most absorbent?
Fair Tests	Which tinfoil boat shape floats the best?



Yellow Class - Summer 1



Unit

Animals inc. Humans: Animal Focus

Progression of Knowledge, Skills and Understanding

Reception Expectations:

Children can make observations of animals and plants and explain why some things occur, and talk about changes.

Year 1 Expectations:

Children can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals.

Children can identify and name a variety of common animals that are carnivores, herbivores and omnivores.

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

Observing over time

Pattern seeking

Research

What can you find out about: fish, amphibians, reptiles, birds and mammals?

Identifying & classifying

How can we organise all the zoo animals?

What would you feed these animals?

Comparative tests

Fair Tests



Yellow Class - Summer 2



Unit

Seasonal Change

Progression of Knowledge, Skills and Understanding

Reception Expectations:

Children can look closely at similarities, differences, patterns and change.

Children can talk about the features of my own immediate

Year 1 Expectations:

Children can observe changes across the four seasons.

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

Observing over time	How light is our classroom at different times of the day and different times of the term?
Pattern seeking	Do trees with bigger leaves lose their leaves first in Autumn?
Research	
Identifying & classifying	How would you group these things based on which season you are most likely to see them in?
Comparative tests	In which season does it rain the most?
Fair Tests	

Green Class - Working Scientifically Throughout

Key Knowledge, Skills and Understanding

Year 1 and 2 Expectations:

Children can ask simple questions and recognise that they can be answered in different ways.

Children can observe closely, using simple equipment.

Children can perform simple tests.

Children can identify and classify

Children can use observations and ideas to suggest answers to questions.





Green Class - Autumn 1



Unit

Animals inc. Humans: Animal Focus (Year 1&2)

Progression of Knowledge, Skills and Understanding

Year 1 Expectations:

Children can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals.

Children can identify and name a variety of common animals that are carnivores, herbivores and omnivores.

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

Year 2 Expectations:

Children can notice that **animals**, including humans, have offspring which grow into adults.

Children can find out about and describe the basic needs of **animals**, including humans, for survival (water, food and air).

Observing over time	How does a tadpole change over time?
Pattern seeking	
Research	What can you find out about: fish, amphibians, reptiles, birds and mammals?
Identifying & classifying	How can we organise all the zoo animals? What would you feed these animals?
Comparative tests	
Fair Tests	



Green Class - Autumn 2



Unit

Living things and their habitats (Year 2)

Progression of Knowledge, Skills and Understanding

Year 1 Expectations and Year 2 Expectations:

Children can explore and compare the differences between things that are living, dead and things that's have never been alive.

Children can 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.

Children can identify and name a variety of plants and animals in their habitats, including micro-habitats.

Children can 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.

Observing over time	What conditions do woodlice prefer to live in?
Pattern seeking	Which habitat do worms prefer – where can we find the most worms?
Research	How does the habitat of the artic compare to the habitat of the Sahara?
Identifying & classifying	How would you group things to show which are living, dead or have never been alive?
Comparative tests	
Fair Tests	



Green Class - Spring 1

Unit

Everyday Materials (Year 1&2)

Progression of Knowledge, Skills and Understanding

Year 1 Expectations:

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

Year 2 Expectations:

- Children can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- Children can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Observing over time	What happens to ice over time?
Pattern seeking	
Research	Which materials can be recycled?
Identifying & classifying	Making an boat – which materials are waterproof?
Comparative tests	Which materials are the most absorbent? Which material changes most with squashing, bending, twisting and stretching and does this change stay or disappear?
Fair Tests	Which tinfoil boat shape floats the best?



Green Class - Spring 2

Unit

Seasonal Change (Year 1)

Progression of Knowledge, Skills and Understanding

Year 1 Expectations:

Children can observe changes across the four seasons.

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

Year 2 Expectations:

Unit revision.

Observing over time	How light is our classroom at different times of the day and different times of the term?
Pattern seeking	Do trees with bigger leaves lose their leaves first in Autumn?
Research	
Identifying & classifying	How would you group these things based on which season you are most likely to see them in?
Comparative tests	In which season does it rain the most?
Fair Tests	



Green Class - Summer 1



Unit

Animals inc. Humans: Human Focus (Year 1&2)

Progression of Knowledge, Skills and Understanding

Year 1 Expectations:

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

Year 2 Expectations:

Children can notice that animals, including humans, have offspring which grow into adults.

Children can find out about and describe the basic needs of animals, including humans, for survival (water, food and air).

Children can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Observing over time	How does my height change over the year?
Pattern seeking	Do you get better at smelling as you get older?
Research	
Identifying & classifying	Which offspring belongs to which animal?
Comparative tests	Is our sense of smell better when we can't see?
Fair Tests	



Green Class - Summer 2



Unit

Plants (Year 1 & 2)

Progression of Knowledge, Skills and Understanding

Year 1 Expectations:

Children can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.

Children can identify and describe the basic structure of a variety of common flowering plants, including trees.

Year 2 Expectations:

Children can observe and describe how seeds and bulbs grow into mature plants.

Children can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Observing over time	How do my seeds change each week?
Pattern seeking	Is there a pattern in where we find plants growing in the school grounds?
Research	
Identifying & classifying	How can we sort the leaves that we collected on our walk?
Comparative tests	Which type of compost grows the tallest plant?
Fair Tests	Where will my plant grow the best?

Blue Class - Working Scientifically Throughout

Key Knowledge, Skills and Understanding

Year 2 Expectations:

Children can ask simple questions and recognise that they can be answered in different ways.

Children can observe closely, using simple equipment.

Children can perform simple tests.

Children can identify and classify

Children can use observations and ideas to suggest answers to questions.





Blue Class - Autumn 1

Unit

Living things and their habitats: Animals Focus (Year 2)

Progression of Knowledge, Skills and Understanding

Year 2 Expectations:

Children can explore and compare the differences between things that are living, dead and things that's have never been alive.

Children can 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.

Children can identify and name a variety of plants and **animals** in their habitats, including micro-habitats.

Children can 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.

Observing over time

What conditions do woodlice prefer to live in?

Pattern seeking

Which habitat do worms prefer – where can we find the most worms?

Research

How does the habitat of the artic compare to the habitat of the desert?

Identifying & classifying

How would you group things to show which are living, dead or have never been alive?

Comparative tests

Fair Tests



Blue Class - Autumn 2

Unit

Living things and their habitats: Plant Focus (Year 2)

Progression of Knowledge, Skills and Understanding

Year 2 Expectations:

Children can explore and compare the differences between things that are living, dead and things that's have never been alive.

Children can 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.

Children can identify and name a variety of **plants** and animals in their habitats, including micro-habitats.

Observing over time

Pattern seeking

Research

What do plants need to survive?

Identifying & classifying

Which different plants are around my school?

Comparative tests

Does a plant with roots grow as well as a plant with the roots removed?

Fair Tests

Where will my seed grow the best?



Blue Class - Spring 1



Unit

Animals inc. Humans: Human Focus (Year 2)

Progression of Knowledge, Skills and Understanding

Year 2 Expectations:

Children can notice that animals, including humans, have offspring which grow into adults.

Children can find out about and describe the basic needs of animals, including humans, for survival (water, food and air).

Children can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Observing over time	How does my heart rate change with exercise?
Pattern seeking	Which age group of children wash their hands the most in a day?
Research	What do humans need to survive?
Identifying & classifying	
Comparative tests	What cleans our hands the best?
Fair Tests	



Blue Class - Spring 2

Unit

Everyday Materials (Year 2)

Progression of Knowledge, Skills and Understanding

Year 2 Expectations:

Children can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.

Children can find out how the shapes of solid objects made from some materials Children can be changed by squashing, bending, twisting and stretching.

Observing over time	Would a paper boat float forever?
Pattern seeking	
Research	How are plastics made?
Identifying & classifying	Which materials will let water go through them, and which will not?
Comparative tests	Which material would be best for the roof of our school?
Fair Tests	Which material would be keep the rain out of our school?



Blue Class - Summer 1

Unit

Animals inc. Humans: Animal Focus (Year 2)

Progression of Knowledge, Skills and Understanding

Year 2 Expectations:

Children can notice that **animals**, including humans, have offspring which grow into adults.
Children can find out about and describe the basic needs of **animals**, including humans, for survival (water, food and air).

Observing over time	How does a tadpole change over time?
Pattern seeking	
Research	
Identifying & classifying	Which offspring belongs to which animal?
Comparative tests	
Fair Tests	



Blue Class - Summer 2



Unit

Plants (Year 2)

Progression of Knowledge, Skills and Understanding

Year 2 Expectations:

Children can observe and describe how seeds and bulbs grow into mature plants.

Children can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Observing over time

What happens to my bean after I have planted it?

Pattern seeking

Do bigger seeds grow into bigger plants?

Research

How can we identify the trees that we observed on our tree hunt?

Identifying & classifying

Comparative tests

Do cress seeds grow quicker inside or outside?

Fair Tests

Where do my cress seeds grow best?

Orange Class - Working Scientifically Throughout

Key Knowledge, Skills and Understanding

Year 3 Expectations:

Children can ask relevant questions and using different types of scientific enquiries to answer them.

Children can set up simple practical enquiries, comparative and fair tests.

Children can make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.

Children can gather, record, classify and present data in a variety of ways to help in answering questions

Children can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.

Children can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

Children can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

Children can identify differences, similarities or changes related to simple scientific ideas and processes.





Orange Class - Autumn 1



Unit

Rocks (Year 3)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations:

Children can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.

Children can describe in simple terms how fossils are formed when things that have lived are trapped within rock.

Children can recognise that soils are made from rocks and organic matter.

Observing over time

Pattern seeking

Research

Who was Mary Anning and what did she discover?

Identifying & classifying

Comparative tests

Which soil absorbs the most water?

Fair Tests

How does adding different amounts of sand to soil affect how quickly water drains through it



Orange Class - Autumn 2 & Spring 1



Unit

Forces and Magnets (Year 3)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations:

Children can compare how things move on different surfaces.

Children can notice that some forces need contact between two objects, but magnetic forces can act at a distance.

Children can observe how magnets attract or repel each other and attract some materials and not others.

Children can 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.

Children can describe magnets as having two poles.

Children can predict whether two magnets will attract or repel each other, depending on which poles are facing.

Observing over time	If we magnetise a pin, how long does it stay magnetised for?
Pattern seeking	Does the size and shape of a magnet affect how strong it is?
Research	
Identifying & classifying	Which materials are magnetic?
Comparative tests	Which magnet is the strongest?
Fair Tests	Which material would sole a shoe best?



Orange Class - Spring 2



Unit

Plants (Year 3)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations:

Children can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.

Children can 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.

Children can investigate the way in which water is transported within plants.

Children can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Observing over time	What happens to celery when it is left in a glass of coloured water?
Pattern seeking	
Research	What are all the different ways that seeds disperse?
Identifying & classifying	
Comparative tests	Which conditions help seeds germinate faster?
Fair Tests	How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals?
	What do we need to keep the same and what do we need to change when testing where plant grow the best?



Orange Class - Summer 1



Unit

Light (Year 3)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations:

Children can recognise that need light in order to see things and that dark is the absence of light.

Children can notice that light is reflected from surfaces.

Children can recognise that light from the sun can be dangerous and that there are ways to protect their eyes.

Children can recognise that shadows are formed when the light from a light source is blocked by a solid object.

Children can find patterns in the way that the size of shadows change.

Observing over time

When is our classroom the darkest? Is the Sun the same brightness all day?

Pattern seeking

Are you more likely to have bad eyesight and to wear glasses if you are older?

Research

How does the Sun make light?

Identifying & classifying

Comparative tests

Fair Tests

How does the distance between the shadow puppet and the screen affect the size of the shadow?



Orange Class - Summer 2



Unit

Animals inc. Humans (Year 3)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations:

Children can 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.

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

Observing over time

Pattern seeking

Do male humans have larger feet than female humans?

Research

Identifying & classifying

How do skeletons of different animals compare?

Comparative tests

Fair Tests

How does the angle that your elbow is bent affect the circumference of your upper arm?

Lime Class - Working Scientifically Throughout

Key Knowledge, Skills and Understanding

Year 3 and 4 Expectations:

Children can ask relevant questions and using different types of scientific enquiries to answer them.

Children can set up simple practical enquiries, comparative and fair tests.

Children can make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.

Children can gather, record, classify and present data in a variety of ways to help in answering questions

Children can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.

Children can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

Children can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

Children can identify differences, similarities or changes related to simple scientific ideas and processes.





Lime Class - Autumn 1

Unit

Animals inc. Humans (Year 4 and Year 3 short)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations:

Children can 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.

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

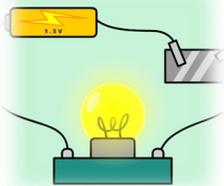
Year 4 Expectations:

Children can describe the simple functions of the basic parts of the digestive system in humans.

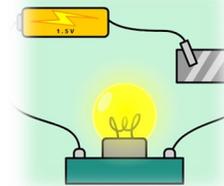
Children can identify the different types of teeth in humans and their simple functions.

Children can construct and interpret a variety of food chains, identifying producers, predators and prey.

Observing over time	How does an egg shell change when it is left in cola?
Pattern seeking	
Research	How do dentists fix broken teeth?
Identifying & classifying	What are the names for all the organs involved in the digestive system? How can we organise our teeth into groups?
Comparative tests	
Fair Tests	



Lime Class - Autumn 2



Unit

Electricity (Year 4)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations and Year 4 Expectations:

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

Observing over time	
Pattern seeking	
Research	
Identifying & classifying	How would you group these electrical devices based on where the electricity comes from?
Comparative tests	Which material is the best conductor of electricity? How does the thickness of a conducting material affect how bright the lamp is?
Fair Tests	How does the thickness of a conducting material affect how bright the lamp is?



Lime Class - Autumn 2



Unit

Light (Year 3 short)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations:

Children can recognise that need light in order to see things and that dark is the absence of light.

Children can notice that light is reflected from surfaces.

Children can recognise that light from the sun can be dangerous and that there are ways to protect their eyes.

Children can recognise that shadows are formed when the light from a light source is blocked by a solid object.

Children can find patterns in the way that the size of shadows change.

Year 4 Expectations:

Revision Unit

Observing over time	When is our classroom the darkest? Is the Sun the same brightness all day?
Pattern seeking	Are you more likely to have bad eyesight and to wear glasses if you are older?
Research	How does the Sun make light?
Identifying & classifying	
Comparative tests	
Fair Tests	How does the distance between the shadow puppet and the screen affect the size of the shadow?



Lime Class - Spring 1

Unit

Living things and their habitats (Year 4)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations and Year 4 Expectations:

Children can recognise that living things can be grouped in a variety of ways.

Children can explore and use classification keys to help group, identify and name a variety of living things in my local and wider environment.

Children can recognise that environments can change and that this can sometimes pose dangers to living things.

Observing over time

Pattern seeking

Where in our local area is the most polluted?

Research

Can we find other animals to add complexity to our classification key?

Identifying & classifying

Can we use the classification keys to identify all the animals that we found in our quad?

Comparative tests

Fair Tests

Does the amount of light affect how many woodlice move around?



Lime Class - Spring 2



Unit

Rocks (Year 3 short)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations:

Children can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.

Children can describe in simple terms how fossils are formed when things that have lived are trapped within rock.

Children can recognise that soils are made from rocks and organic matter.

Year 4 Expectations:

Revision Unit

Observing over time

Pattern seeking

Research

Who was Mary Anning and what did she discover?

Identifying & classifying

Comparative tests

Which soil absorbs the most water?

Fair Tests

How does adding different amounts of sand to soil affect how quickly water drains through it



Lime Class - Spring 2



Unit

States of Matter (Year 4)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations and Year 4 Expectations:

Children can compare and group materials together, according to whether they are solids, liquids or gases.

Children can 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 ($^{\circ}\text{C}$).

Children can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Observing over time	How does the level of water in a glass change when left on the windowsill?
Pattern seeking	Is there a pattern in how long it takes different sized ice lollies to melt?
Research	
Identifying & classifying	
Comparative tests	Do all liquids freeze at the same temperature?
Fair Tests	How does the surface area of a container of water affect how long it takes to evaporate?



Lime Class - Summer 1



Unit

Sound (Year 4)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations and Year 4 Expectations:

Children can identify how sounds are made, associating some of them with something vibrating.

Children can recognise that vibrations from sounds travel through a medium to the ear.

Children can find patterns between the pitch of a sound and features of the object that produced it.

Children can find patterns between the volume of a sound and the strength of the vibrations that produced it.

Children can recognise that sounds get fainter as the distance from the sound source increases.

Observing over time	When is our classroom the quietest?
Pattern seeking	
Research	
Identifying & classifying	
Comparative tests	Which material is best to use for muffling sound in ear defenders?
Fair Tests	How does the volume of a drum change as you move further away from it? How does the length of a guitar string/tuning fork/paper art straw affect the pitch of the sound?



Lime Class - Summer 2



Unit

Plants (Year 3 short)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations:

Children can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.

Children can 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.

Children can investigate the way in which water is transported within plants.

Children can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Year 4 Expectations:

Revision Unit

Observing over time	What happens to celery when it is left in a glass of coloured water?
Pattern seeking	
Research	What are all the different ways that seeds disperse?
Identifying & classifying	
Comparative tests	Which conditions help seeds germinate faster?
Fair Tests	How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals?
	What do we need to keep the same and what do we need to change when testing where plant grow the best?



Lime Class - Summer 2



Unit

Forces and Magnets (Year 3 short)

Progression of Knowledge, Skills and Understanding

Year 3 Expectations:

Children can compare how things move on different surfaces.

Children can notice that some forces need contact between two objects, but magnetic forces can act at a distance.

Children can observe how magnets attract or repel each other and attract some materials and not others.

Children can 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.

Children can describe magnets as having two poles.

Children can predict whether two magnets will attract or repel each other, depending on which poles are facing.

Year 4 Expectations:

Revision Unit

Observing over time	If we magnetise a pin, how long does it stay magnetised for?
Pattern seeking	Does the size and shape of a magnet affect how strong it is?
Research	
Identifying & classifying	Which materials are magnetic?
Comparative tests	Which magnet is the strongest?
Fair Tests	

Lilac Class - Working Scientifically Throughout

Key Knowledge, Skills and Understanding

Year 4 Expectations:

Children can ask relevant questions and using different types of scientific enquiries to answer them.

Children can set up simple practical enquiries, comparative and fair tests.

Children can make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.

Children can gather, record, classify and present data in a variety of ways to help in answering questions

Children can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.

Children can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

Children can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

Children can identify differences, similarities or changes related to simple scientific ideas and processes.

Year 5 Expectations:

Children can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.

Children can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.

Children can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

Children can use test results to make predictions to set up further comparative and fair tests.

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

Children can identify scientific evidence that has been used to support or refute ideas or arguments.





Lilac Class - Autumn 1



Unit

Forces and magnets (Year 5)

Progression of Knowledge, Skills and Understanding

Year 4 Expectations and Year 5 Expectations:

Children can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.

Children can identify the effects of air resistance, water resistance and friction, that act between moving surfaces.

Children can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Observing over time	
Pattern seeking	Do all objects fall through water or the air in the same way?
Research	
Identifying & classifying	Can you label and name all the forces acting on the objects in each of these situations?
Comparative tests	Which shape parachute takes the longest to fall?
Fair Tests	How does the surface area of a container affect the time it takes to sink?



Lilac Class - Autumn 1

Unit

Earth and Space (Year 5)

Progression of Knowledge, Skills and Understanding

Year 4 Expectations and Year 5 Expectations:

Children can describe the movement of the Earth, and other planets, relative to the Sun in the solar system.

Children can describe the movement of the Moon relative to the Earth.

Children can describe the Sun, Earth and Moon as approximately spherical bodies.

Children can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Observing over time	How does shadow length change over the day?
Pattern seeking	Is there a pattern between the size of a planet and the time it takes to travel around the sun?
Research	What unusual objects did Jocelyn Bell Burnell discover?
Identifying & classifying	Can you observe and identify all the phases in the cycle of the moon?
Comparative tests	
Fair Tests	



Lilac Class - Autumn 2



Unit

Properties and changes of materials (Year 5)

Progression of Knowledge, Skills and Understanding

Year 4 Expectations and Year 5 Expectations:

Children can 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.

Children can know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.

Children can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.

Children can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

Children can demonstrate that dissolving, mixing and changes of state are reversible changes.

Children can 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.

Observing over time	How does a container of salt water change over time? How does a nail in salt water change over time?
Pattern seeking	
Research	
Identifying & classifying	Can you classify materials depending on their: hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.
Comparative tests	Which type of sugar dissolves the fastest?
Fair Tests	How does the temperature of tea affect how long it takes for a sugar cube to dissolve?



Lilac Class - Spring 1

Unit

Living things and their habitats (Year 4&5)

Progression of Knowledge, Skills and Understanding

Year 4 Expectations:

Children can recognise that living things can be grouped in a variety of ways.

Children can explore and use classification keys to help group, identify and name a variety of living things in my local and wider environment.

Children can recognise that environments can change and that this can sometimes pose dangers to living things.

Year 5 Expectations:

Children can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.

Children can describe the life process of reproduction in some plants and animals.

Observing over time

How does a bean change as it germinates?

Pattern seeking

Research

How do plants and animals reproduce?

Identifying & classifying

What are the differences between the life cycle of an insect and a mammal?

Comparative tests

Fair Tests



Lime Class - Spring 2



Unit

States of matter (Year 4 short)

Progression of Knowledge, Skills and Understanding

Year 4 Expectations:

Children can compare and group materials together, according to whether they are solids, liquids or gases.

Children can 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 ($^{\circ}\text{C}$).

Children can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Year 5 Expectations:

Revision Unit

Observing over time	How does the level of water in a glass change when left on the windowsill?
Pattern seeking	Is there a pattern in how long it takes different sized ice lollies to melt?
Research	
Identifying & classifying	
Comparative tests	Do all liquids freeze at the same temperature?
Fair Tests	How does the surface area of a container of water affect how long it takes to evaporate?



Lilac Class - Summer 1



Unit

Sound (Year 4 short)

Progression of Knowledge, Skills and Understanding

Year 4 Expectations:

Children can identify how sounds are made, associating some of them with something vibrating.

Children can recognise that vibrations from sounds travel through a medium to the ear.

Children can find patterns between the pitch of a sound and features of the object that produced it.

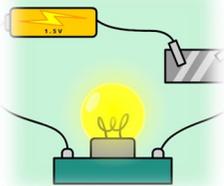
Children can find patterns between the volume of a sound and the strength of the vibrations that produced it.

Children can recognise that sounds get fainter as the distance from the sound source increases.

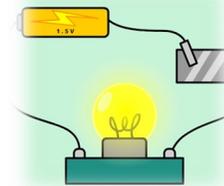
Year 5 Expectations:

Revision Unit

Observing over time	When is our classroom the quietest?
Pattern seeking	
Research	
Identifying & classifying	
Comparative tests	Which material is best to use for muffling sound in ear defenders?
Fair Tests	How does the volume of a drum change as you move further away from it?
	How does the length of a guitar string/tuning fork/paper art straw affect the pitch of the sound?



Lilac Class - Summer 1



Unit

Electricity (Year 4 short)

Progression of Knowledge, Skills and Understanding

Year 4 Expectations:

Children can identify common appliances that run on electricity.

Children can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.

Children can 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.

Children can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.

Children can recognise some common conductors and insulators, and associate metals with being good conductors.

Year 5 Expectations:

Revision Unit

Observing over time	
Pattern seeking	
Research	
Identifying & classifying	How would you group these electrical devices based on where the electricity comes from?
Comparative tests	Which material is the best conductor of electricity? How does the thickness of a conducting material affect how bright the lamp is?
Fair Tests	How does the thickness of a conducting material affect how bright the lamp is?



Lilac Class - Summer 2

Unit

Animals inc. Humans (Year 4&5)

Progression of Knowledge, Skills and Understanding

Year 4 Expectations:

Children can describe the simple functions of the basic parts of the digestive system in humans.

Children can identify the different types of teeth in humans and their simple functions.

Children can construct and interpret a variety of food chains, identifying producers, predators and prey.

Year 5 Expectations:

Children can describe the changes as humans develop to old age.

Observing over time

Are the oldest children in our school the tallest?

Pattern seeking

Research

Identifying & classifying

Can you identify all the stages in the human life cycle?

Comparative tests

Who grows the fastest, girls or boys?

Fair Tests

How does age affect a human's reaction time?

Turquoise Class - Working Scientifically Throughout

Key Knowledge, Skills and Understanding

Year 5 and 6 Expectations:

Children can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.

Children can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.

Children can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

Children can use test results to make predictions to set up further comparative and fair tests.

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

Children can identify scientific evidence that has been used to support or refute ideas or arguments.





Turquoise Class - Autumn 1



Unit

Animals inc. Humans (Year 5&6)

Progression of Knowledge, Skills and Understanding

Year 5 Expectations:

Children can describe the changes as humans develop to old age.

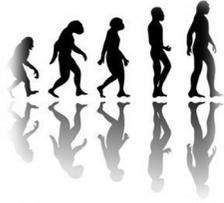
Year 6 Expectations:

Children can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.

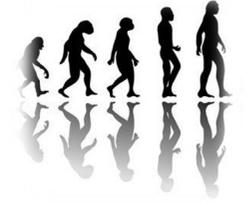
Children can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.

Children can describe the ways in which nutrients and water are transported within animals, including humans.

Observing over time	How does my heart rate change over the day?
Pattern seeking	
Research	
Identifying & classifying	Which organs of the body make up the circulatory system?
Comparative tests	Which types of exercise has the greatest effect on our heart rate?
Fair Tests	Can exercising regularly affect your lung capacity?



Turquoise Class - Autumn 2



Unit

Evolution and inheritance (Year 6)

Progression of Knowledge, Skills and Understanding

Year 5 Expectations and Year 6 Expectations:

Children can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

Children can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.

Children can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Observing over time

Pattern seeking

Is there a pattern between the size and shape of a bird's beak and the food it will eat?

Research

What happened when Charles Darwin visited the Galapagos islands?

Identifying & classifying

Compare the skeletons of apes, humans and Neanderthals.

How are certain animals adapted to their environments?

Comparative tests

Fair Tests



Turquoise Class - Spring 1



Unit

Properties and changes of materials (Year 5 short)

Progression of Knowledge, Skills and Understanding

Year 5 Expectations:

Children can 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.

Children can know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.

Children can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.

Children can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

Children can demonstrate that dissolving, mixing and changes of state are reversible changes.

Children can 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 6 Expectations:

Revision Unit

Observing over time	How does a container of salt water change over time? How does a nail in salt water change over time?
Pattern seeking	
Research	
Identifying & classifying	Can you classify materials depending on their: hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.
Comparative tests	Which type of sugar dissolves the fastest?
Fair Tests	How does the temperature of tea affect how long it takes for a sugar cube to dissolve?



Turquoise Class - Spring 2



Unit

Light (Year 6)

Progression of Knowledge, Skills and Understanding

Year 5 Expectations and Year 6 Expectations:

Children can recognise that light appears to travel in straight lines.

Children can use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.

Children can explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.

Children can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Observing over time

Pattern seeking

Is there a pattern to how bright it is in school over the day? Is it the same in every classroom?

Research

Identifying & classifying

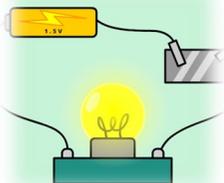
Can you identify all the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together?

Comparative tests

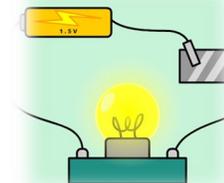
Which material is most reflective?

Fair Tests

How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface?



Turquoise Class - Spring 2



Unit

Electricity (Year 6)

Progression of Knowledge, Skills and Understanding

Year 5 Expectations and Year 6 Expectations:

Children can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.

Children can compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.

Children can use recognised symbols when representing a simple circuit in a diagram.

Observing over time

Pattern seeking

Research

How has our understanding of electricity changed over time?

Identifying & classifying

Comparative tests

Which make of battery lasts the longest?

Which type of fruit makes the best fruity battery?

Fair Tests

How does the voltage of the batteries in a circuit affect the brightness of the lamp?



Turquoise Class - Summer 1



Unit

Forces and Magnets (Year 5 short)

Progression of Knowledge, Skills and Understanding

Year 5 Expectations:

Children can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.

Children can identify the effects of air resistance, water resistance and friction, that act between moving surfaces.

Children can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Year 6 Expectations:

Revision Unit

Observing over time

Pattern seeking

Do all objects fall through water or the air in the same way?

Research

Identifying & classifying

Can you label and name all the forces acting on the objects in each of these situations?

Comparative tests

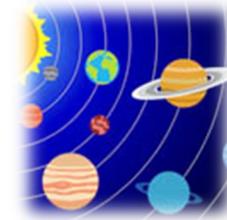
Which shape parachute takes the longest to fall?

Fair Tests

How does the surface area of a container affect the time it takes to sink?



Turquoise Class - Summer 1



Unit

Earth and Space (Year 5 short)

Progression of Knowledge, Skills and Understanding

Year 5 Expectations:

Children can describe the movement of the Earth, and other planets, relative to the Sun in the solar system.

Children can describe the movement of the Moon relative to the Earth.

Children can describe the Sun, Earth and Moon as approximately spherical bodies.

Children can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Year 6 Expectations:

Revision Unit

Observing over time	How does shadow length change over the day?
Pattern seeking	Is there a pattern between the size of a planet and the time it takes to travel around the sun?
Research	What unusual objects did Jocelyn Bell Burnell discover?
Identifying & classifying	Can you observe and identify all the phases in the cycle of the moon?
Comparative tests	
Fair Tests	



Turquoise Class - Summer 2



Unit

Living things and their habitats (Year 5&6)

Progression of Knowledge, Skills and Understanding

Year 5 Expectations:

Children can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.

Children can describe the life process of reproduction in some plants and animals.

Year 6 Expectations:

Children can describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.

Children can give reasons for classifying plants and animals based on specific characteristics.

Observing over time

What happens to a piece of bread if you leave it on the windowsill for two weeks?

Pattern seeking

Research

What do different microorganisms do? Are they always harmful?

Identifying & classifying

Can I give reasons for classifying plants and animals based on specific characteristics?

Comparative tests

Fair Tests

Purple Class - Working Scientifically Throughout

Key Knowledge, Skills and Understanding

Year 6 Expectations:

Children can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.

Children can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.

Children can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

Children can use test results to make predictions to set up further comparative and fair tests.

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

Children can identify scientific evidence that has been used to support or refute ideas or arguments.





Purple Class - Spring



Biology Revision Unit

Plants

Progression of Knowledge, Skills and Understanding

Year 3 Revision:

Children can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.

Children can 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.

Children can investigate the way in which water is transported within plants.

Children can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Observing over time

Pattern seeking

Research

Find out about plant reproduction and the part in the plant which play vital roles.

Identifying & classifying

Can I create a branching database to classify trees/leaves?

Comparative tests

Which seeds travel furthest in wind dispersal?

Fair Tests



Purple Class - Spring

Biology Unit

Living things and their habitats

Progression of Knowledge, Skills and Understanding

Year 4 Revision:

Children can recognise that living things can be grouped in a variety of ways.

Children can explore and use classification keys to help group, identify and name a variety of living things in my local and wider environment.

Children can recognise that environments can change and that this can sometimes pose dangers to living things.

Year 5 Revision:

Children can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.

Children can describe the life process of reproduction in some plants and animals.

Year 6 Revision:

Children can describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.

Children can give reasons for classifying plants and animals based on specific characteristics.

Observing over time	What happens to a piece of bread if you leave it on the windowsill for two weeks?
Pattern seeking	
Research	What do different microorganisms do? Are they always harmful?
Identifying & classifying	Can I give reasons for classifying plants and animals based on specific characteristics?
Comparative tests	
Fair Tests	



Purple Class - Spring

Biology Revision Unit

Animals inc. Humans

Progression of Knowledge, Skills and Understanding

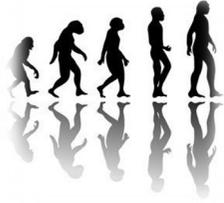
Year 3 Revision:
 Children can identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.
 Children can identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Year 4 Revision:
 Children can describe the simple functions of the basic parts of the digestive system in humans.
 Children can identify the different types of teeth in humans and their simple functions.
 Children can construct and interpret a variety of food chains, identifying producers, predators and prey.

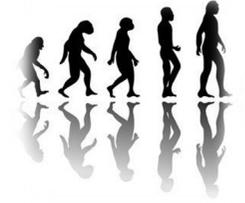
Year 5 Expectations:
 Children can describe the changes as humans develop to old age.

Year 6 Expectations:
 Children can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
 Children can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
 Children can describe the ways in which nutrients and water are transported within animals, including humans.

Observing over time	How does my heart rate change over the day?
Pattern seeking	
Research	
Identifying & classifying	Which organs of the body make up the circulatory system?
Comparative tests	Which types of exercise has the greatest effect on our heart rate?
Fair Tests	Can exercising regularly affect your lung capacity?



Purple Class - Spring



Biology Revision Unit

Evolution and inheritance

Progression of Knowledge, Skills and Understanding

Year 6:

Children can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

Children can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.

Children can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Observing over time

Pattern seeking

Is there a pattern between the size and shape of a bird's beak and the food it will eat?

Research

What happened when Charles Darwin visited the Galapagos islands?

Identifying & classifying

Compare the skeletons of apes, humans and Neanderthals.

How are certain animals adapted to their environments?

Comparative tests

Fair Tests



Purple Class - Autumn



Physics Revision Unit

Light

Progression of Knowledge, Skills and Understanding

Year 3 Revision:

Children can recognise that they need light in order to see things and that dark is the absence of light.

Children can notice that light is reflected from surfaces.

Children can recognise that light from the sun can be dangerous and that there are ways to protect their eyes.

Children can recognise that shadows are formed when the light from a light source is blocked by a solid object.

Children can find patterns in the way that the size of shadows change.

Year 6 Revision:

Children can recognise that light appears to travel in straight lines.

Children can use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.

Children can explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.

Children can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Observing over time

Pattern seeking

Is there a pattern to how bright it is in school over the day? Is it the same in every classroom?

Research

Identifying & classifying

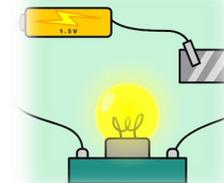
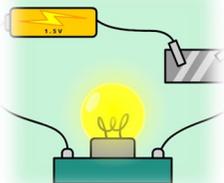
Can you identify all the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together?

Comparative tests

Which material is most reflective?

Fair Tests

How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface?



Purple Class - Autumn

Physics Revision Unit

Electricity

Progression of Knowledge, Skills and Understanding

Year 4 Revision:

Children can identify common appliances that run on electricity.

Children can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.

Children can 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.

Children can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.

Children can recognise some common conductors and insulators, and associate metals with being

Year 6:

Children can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.

Children can compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.

Children can use recognised symbols when representing a simple circuit in a diagram.

Observing over time

Pattern seeking

Research

How has our understanding of electricity changed over time?

Identifying & classifying

Comparative tests

Which make of battery lasts the longest?

Which type of fruit makes the best fruity battery?

Fair Tests

How does the voltage of the batteries in a circuit affect the brightness of the lamp?



Purple Class - Autumn



Physics Revision Unit

Sound

Progression of Knowledge, Skills and Understanding

Year 4 Revision:

Children can identify how sounds are made, associating some of them with something vibrating.

Children can recognise that vibrations from sounds travel through a medium to the ear.

Children can find patterns between the pitch of a sound and features of the object that produced it.

Children can find patterns between the volume of a sound and the strength of the vibrations that produced it.

Children can recognise that sounds get fainter as the distance from the sound source increases.

Observing over time

Pattern seeking

What are the patterns between the pitch of a sound and features of the object that produced it.
What are the patterns between the volume of a sound and the strength of the vibrations that produced it?

Research

Identifying & classifying

Can I group the instruments by the sound they create, thinking about the features of the object and the pitch?

Comparative tests

Fair Tests

What happens to the sound of the wooden block as we move further away?



Purple Class - Autumn



Physics Revision Unit

Forces and Magnets

Progression of Knowledge, Skills and Understanding

Year 3 Revision:

Children can compare how things move on different surfaces.

Children can notice that some forces need contact between two objects, but magnetic forces can act at a distance.

Children can observe how magnets attract or repel each other and attract some materials and not others.

Children can 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.

Children can describe magnets as having two poles.

Children can predict whether two magnets will attract or repel each other, depending on which poles are facing.

Year 5 Revision:

Children can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.

Children can identify the effects of air resistance, water resistance and friction, that act between moving surfaces.

Children can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Observing over time

Pattern seeking

Do all objects fall through water or the air in the same way?

Research

Who researched gravity?

Identifying & classifying

Can you label and name all the forces acting on the objects in each of these situations?

Comparative tests

Which shape parachute takes the longest to fall?

Fair Tests

How does the surface area of a container affect the time it takes to sink?



Purple Class - Autumn

Physics Revision Unit

Earth and Space

Progression of Knowledge, Skills and Understanding

Year 5 Revision:

Children can describe the movement of the Earth, and other planets, relative to the Sun in the solar system.

Children can describe the movement of the Moon relative to the Earth.

Children can describe the Sun, Earth and Moon as approximately spherical bodies.

Children can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Observing over time

How does shadow length change over the day?

Pattern seeking

Is there a pattern between the distance of a planet from the sun and its temperature?

Research

Name the order of the planets.

Identifying & classifying

Can you observe and identify all the phases in the cycle of the moon?

Comparative tests

Fair Tests



Purple Class - Summer



Chemistry Revision Unit

Rocks

Progression of Knowledge, Skills and Understanding

Year 3 Revision:

Children can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.

Children can describe in simple terms how fossils are formed when things that have lived are trapped within rock.

Children can recognise that soils are made from rocks and organic matter.

Observing over time	
Pattern seeking	
Research	What do archaeologists discover?
Identifying & classifying	Can I sort these rocks depending on their properties?
Comparative tests	Which soil absorbs the most water?
Fair Tests	How does adding different amounts of sand to soil affect how quickly water drains through it? How can soil be separated?



Purple Class - Summer



Chemistry Revision Unit

States of matter

Progression of Knowledge, Skills and Understanding

Year 4 Revision:

Children can compare and group materials together, according to whether they are solids, liquids or gases.

Children can 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 ($^{\circ}\text{C}$).

Children can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Observing over time	Can I observe that some materials change state when they are heated or cooled?
Pattern seeking	
Research	What is the water cycle?
Identifying & classifying	Can I compare and group materials together, according to whether they are solids, liquids or gases?
Comparative tests	
Fair Tests	



Purple Class - Summer



Chemistry Revision Unit

Properties and changes of materials

Progression of Knowledge, Skills and Understanding

Year 5 Revision:

Children can 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.

Children can know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.

Children can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.

Children can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

Children can demonstrate that dissolving, mixing and changes of state are reversible changes.

Children can 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.

Observing over time

Pattern seeking

Research

Identifying & classifying

Which changes are reversible?

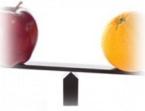
Comparative tests

Which temperature dissolves salt the fastest?

Fair Tests

How would I separate this mixture?

Working Scientifically

Focus	Definition	Times Explored
	<p>Observing over time</p>	<p>Observations taken and recorded over a set period of time.</p> <p>39</p>
	<p>Pattern seeking</p>	<p>Making measurements or observations to explore situations, identifying patterns in the measurements and observations recorded.</p> <p>30</p>
	<p>Research</p>	<p>To find out about a subject or area through books, online or discussions with experts.</p> <p>31</p>
	<p>Identifying and classifying</p>	<p>Sorting objects, materials, living things or events into manageable sets or groups using different criteria.</p> <p>44</p>
	<p>Comparative tests</p>	<p>Less formal than fair testing, this enables children to make tests where they compare variables.</p> <p>39</p>
	<p>Fair tests</p>	<p>A test which controls all but one variable when attempting to answer a scientific question. Keeping other variable the same makes it fair.</p> <p>36</p>



Science Knowledge Organisers



Everyday Materials

YR1 Science NC

Key Vocabulary - Material

Material	Is what something is made of.
Wood	Something that comes from trees.
Glass	A manufactured material, used in window and
Metal	A strong material which can be heated and shaped into anything.
Rock	A natural material which is made up in the
Paper	A manufactured material in thin sheets made
Fabric	A material which used for a range of objects
Plastic	A manufactured material that can be shaped or



Key Vocabulary— Properties

Properties	A thing or things belonging to an object.
Soft	A material that is easy to mould, cut or
Flexible	Can bend easily withhold breaking.
Stiff	A material that can not be easily bent or
Rough	When a object has an uneven or lumpy
Smooth	When an object has an even or flat surface.
Dull	Objects that are not shiny
Waterproof	A material which does not allow water to
Absorbent	A material that is able to soak up a liquid
Transparent	A material that you can see through.
Opaque	A material which you can not see through.
Shiny	A material that reflects light.
Brittle	A material when bent would break.



Everyday Materials

YR1 Science NC

Key Knowledge

Everything around us and the things we use are made if some form of material. All materials come from animals or plants, are dissolved in the sea or mined from the ground. Today some material are artificially made in commercial chemical plants. Some of these are used as they are and others are altered to make new, manufactured materials.

Material can be:

Natural: rocks, soil, water and wood. These have not been changed in anyway.

Manufactured: metals, plastic, glass, rubber, paper, fabrics and bricks. Manufactured materials have been changed in some way.

Key Knowledge

John McAdam

John McAdam was a Scottish engineer who experimented with using new materials to build roads. His process was so successful that roads were built in this way right across the world.



John Dunlop

John Dunlop was a Scottish inventor who invented the air-filled rubber tyre. It was originally invented in 187 to use with bicycles, and then became very useful when the automobiles were developed. He originally used the rubber to make types for his son's tricycle.



Charles Macintosh

Charles Macintosh was a Scottish inventor and chemist who invented waterproof fabrics in 1818. The mackintosh raincoat was introduced in 1824. He invented the first waterproof fabric by painting a rubber liquid onto cloth.





Seasonal Change

YR1 Science NC

Key Vocabulary

Seasons	There are four seasons each year, spring summer, autumn and winter
Spring	The season of spring occurs during the months of March, April and May.
Summer	The season of summer occurs during the months of June, July and August
Autumn	The season of autumn occurs during the month of September, October, November.
Winter	The season of winter occurs during the months of December, January and February.
Weather	The weather includes the temperature outside, the wind direction and strength, as well as rain, cloud, snow and sun.
Daylight	Daylight is when it is light outside. The amount of daylight changes with each season.
Temperature	A degree of hotness or coldness that can be measured using a thermometer.
Forecast	A predication , or good guess, about the weather in the near future.
Shadow	A dark area on a bright surface. It is caused by something blocking a source of light e.g. a building clocking the sun.
Precipitation	The liquid and soiled water particles that fall from the clouds. e.g. rain and snow.
Hibernate	Hibernation occurs when an animal become inactive or 'sleeps' during the cold, short days of winter.



Key Knowledge

Spring

In spring the weather starts to get warmer. The leaves begin to grow on the trees and some trees may blossom (have flowers). Plants begin to grow and you may see baby animals like lambs around. The daytimes start to get longer.



Summer

In summer, the weather gets hotter, the daytime is long and the nights are short. Summer has the longest days. The trees are full of leaves and there are lots of flowers, bees, butterflies and other insects.



Autumn

In autumn the weather begins to get colder. The leaves start to fall from the trees. The amount of daylight becomes less. This means that daytimes are shorter and the night time are longer.



Winter

In winter the weather is much colder. Sometimes it is cold enough to freeze, leaving frost and ice on the ground. It sometimes snows. Many trees have bare branches as all their leaves have fallen off. The day times are shortest in the year and the night times are the longest.





Seasonal Change

YR1 Science NC

Key Knowledge

In the UK we have four seasons: spring, summer, autumn and winter. Summer is the hottest and winter is the coldest.

Spring starts when the day and night are the same length (usually 21st March).

Summer has the longest day of the year, meaning that it has the most sunlight. This is usually around June 21st.

Winter has the shortest day of the year, meaning it has the least sunlight. This is usually around December 21st.

When we have our summer it is winter in the southern hemisphere. When we have our winter Australia has its summer.

In the USA and many other countries the season 'Autumn' is known as the 'fall'. This is because so many leaves fall from trees in Autumn.

Seasonal change throughout the year because of the way Earth travels around the Sun.

Weather symbols are the signs used to help us understand more about our daily weather.



Key Knowledge

Throughout the year, the amount of daylight changes as the season changes.

Month	Hours
January	8
February	10
March	12
April	14
May	15
June	16
July	16
August	14
September	13
October	11
November	9
December	8

Key Knowledge

A thermometer is used to measure the temperature. It will inform us how hot or cold it is. The temperature can be recorded as Celsius or Degree.



A wind vane is an instrument that determines the direction from which the wind is blowing. An anemometer measures wind speed. The cups catch the wind, turning the dial attached to the instrument. The dial shows the wind speed.



A rain gauge is an instrument used to gather and measure the amount of liquid precipitation over a set time.





Living things and their habitats

YR2 Science NC

Key Vocabulary	
Life processes	These are the things that all living things do. They move, breathe, sense, grow, make babies, get rid of waste and get their energy from food.
Organism	An organism is another word for living thing, including
Living	Things that are living have all life processes.
Dead	Things that are dead were once living. They did have all
Never living	Things are the things made out of metal, plastic or rock
Food chain	A food chain shows how each animal gets its food. Food chains are one of the ways that living things depend in each other to stay alive.
Food sources	This is the place a living things food comes from.
Habitat	A habitat is the natural place that something lives. A habitat provided living things with everything that need to survive such as food, shelter and water.
Microhabitat	A microhabitat is a very small habitat in places like under a rock, under leaves or on a branch. Minibeast live in microhabitats, the microhabitats have everything they need to survive.
Depend	Many living things in a habitat depend ion each other.
Survival	This means they stay alive.



Key Vocabulary	
Respiration	Creation of energy rom breathing/ converting oxygen/ carbon dioxide.
Sensitivity	Sensing and resounding to the environment. E.g.
Reproduction	Creation of new plants (seeds) or animals (babies).
Adaptation	How plants/ animals changes to fit the environ-
Consumer	All animals are consumers because the all con-
Producer	Green plants are producers because they produce their on food.
Prey	Animals that eat other animals.
Herbivore	A animal that eats other animals.
Carnivore	A animal that eats either animals/ insects.
Omnivore	An animal that eats both plants and other ani-





Living things and their habitats

YR2 Science NC

Key Knowledge

Living things can be categorised as either living, dead, or has never been alive.

There are seven life processes;

Movement

Respiration

Sensitivity

Growth

Reproduction

Excretion

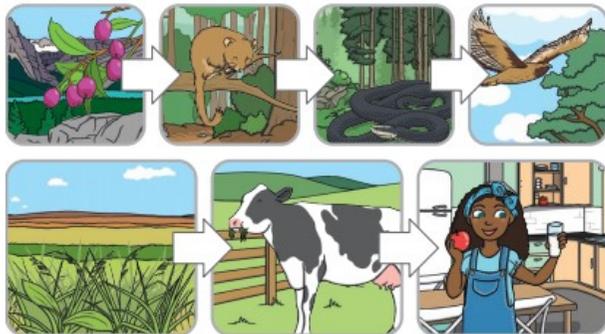
Nutrition

These can be remembered using the acronym - MRS GREN

Animals and plants are specially adapted to living in their habitats.

Living things in a habitats depend on each other for survival

A plant will always respond to a light source.



Key Knowledge: Habitats

Examples of habitats

- Woodland
- Urban
- Coastal
- Rainforest
- Arctic
- Desert
- Ocean
- River
- Mountain



Key Knowledge: Microhabitats

Examples of microhabitats

- Short grass
- Flowers
- Inside rotting wood
- Under leaves
- In and on soil



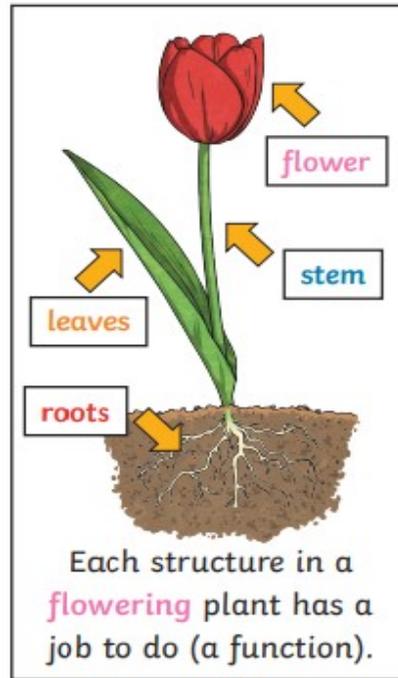


Plants

YR1 Science NC

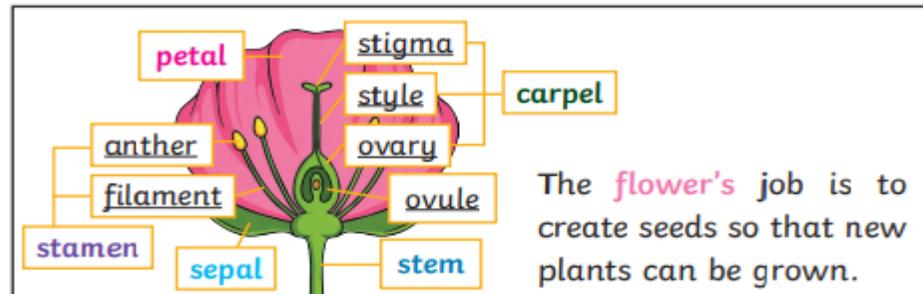
Key Vocabulary—parts of a plant

Roots	These anchor the plant to into the ground and absorb water and nutrient's from the soil.
Stem	This hold the plant up and carries water and nutrients from the soil to the leaves. A trunk is the stem of a tree.
Leaves	These make the food for the plant using sun-light and carbon dioxide from the air.
Flowers	These make seeds to grow into new plants .Their petals attract pollinators to the plant.
Petal	The brightly coloured part of the flower that attracts the insects to pollinate the plant.
Stamen	The male parts of the flower. The stamen is made u of the anther and the filament. The filament's job is to hold up the anther. The job of the anther is to make the pollen.
Carpel	The female part of the flower. Made up of stigma, style and ovary. The job of the style is to hold up the stigma. The stigma collects the pollen when a pollinator brushes it. The ovary is the part of the flower that gets fertilised and eventually becomes the new seed.
Sepal	Leaf- like structures that protect the flower and petals before they open out.



Key Vocabulary

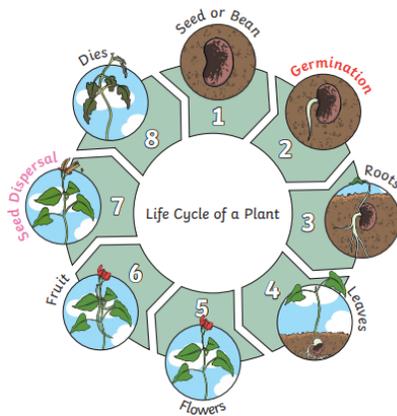
Nutrients	These substances are needed by living things to grow and survive. Plants get nutrients from soil and also make their own food in their leaves.
Evaporation	When a liquid turns into a gas.
Fertilisation	When the male and female parts of the flower attracts insects to pollinate the plant.
Pollen	A fine power produced by a flowering plant.
Pollination	When pollen is moved from the male anther of a
Pollinator	Animals and insects which carry pollen between
Seed Dispersal	A method of moving the seeds away form the parent plant so that the seeds have the best chance of survival.



Plants

YR1 Science NC

Key Knowledge: Life cycle of a plant

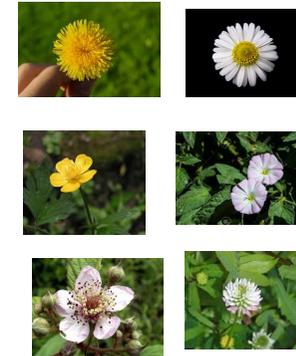


Key Knowledge: Wild plants

A wild plant seeds grows where it falls. It doesn't need to be planted or cared for as it grows.

Example of wild plants

- Dandelion
- Daisy
- Buttercup
- Ivy
- Clover
- Bramble



Key Knowledge: Types of trees

A deciduous tree loses its leaves each year .

Examples of deciduous trees;

- Oak
- Maple
- Birch



An evergreen tree keeps its green leaves all year round, even in winter.

Examples of evergreen trees;

- Pine
- Fir
- Mahogany



Key Knowledge: Garden plants

Garden plants are plants that people choose to grow in their gardens.

Examples of garden plants

- Fuchsia
- Pansy
- Sunflower
- Rose
- Lavender





Animals including humans

YR1 Science NC

Key Vocabulary : Groups of animals

Amphibians	Amphibians live in water as babies and on land as they grow older. They have smooth, slimy
Birds	All birds have a beak, two legs, feathers and wings.
Fish	Fish live and breathe under water. They have scaly skin, fins to help them swim and they
Mammals	Mammals are animals that breathe air, grow hair or fur and feed on their mother's milk as a
Reptiles	Reptiles all breathe air. They have scales on their skin.

Key Vocabulary: Senses

Sight	Your eyes let you see all the things around you.
Hearing	Your ears let you listen to all the things around you. Your brain is able to tell what's different
Touch	Your skin gives you the sense of touch. You can tell if something is warm, cold, smooth or
Taste	Your sense of taste comes from your tongue. You can tell if something tastes sweet or bitter. You might have some tastes that you like and some you don't.
Smell	You smell using your nose. Your nose can tell if things smell nice or not nice.

Senses



sight



hearing



touch



taste



smell

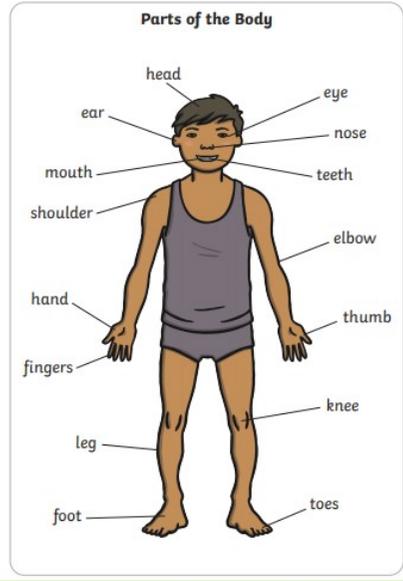
Key Vocabulary

Adult	A fully grown animal or plant,
Develop	To grow and become stronger.
Life cycle	The changes living things go through to become an adult.
Offspring	The child of an animal.
Reproduce	When living things make a new living thing of the same kind.
Young	Offspring that has not reached adulthood.
Live young	Offspring that has not hatched from an egg.
Dehydrate	To lose water.
Diet	The food and water animals need.
Energy	The power needed to carry out a task.
Exercise	A physical activity to keep your body fit.
Nutrition	Food needed to live.
Carnivore	Animals that only eat meat.
Herbivore	Animals that only eat plants.
Omnivore	Animals that eat both plants and other animals.

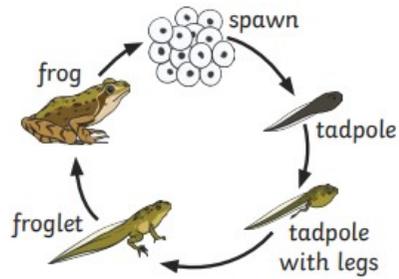
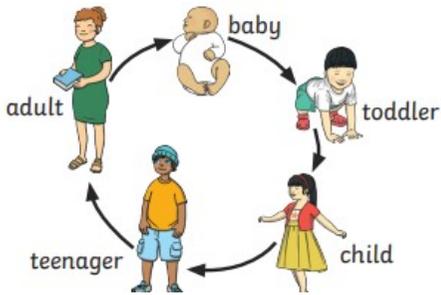
Animals including humans

YR1 Science NC

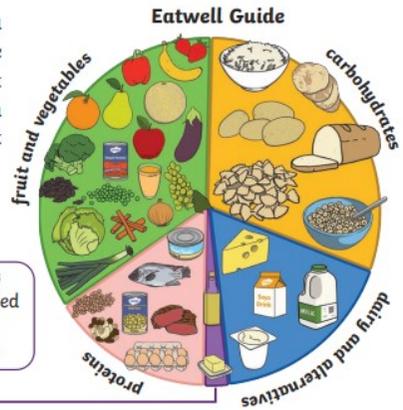
Key Knowledge
Some animals give birth to live young. their offspring normally look like them when born.
Other animals have off spring which does not look like them, e.g. fish and amphibians.
Some animals lay eggs which hatch into live young. This you then develops into an adult. When these eggs hatch, some animals look like their adult, e.g. birds and reptiles.
All young animals change at different stages as they grow into animals.
To stay alive, all animals have three basic needs:
<ul style="list-style-type: none"> • Air • Water • Food
To stop illness and infections spreading, we must be



Key Knowledge: Groups of animals
Mammals
Birds
Fish
Reptiles
Amphibians



To grow into a healthy adult, we must eat the right types of food in the right amount and **exercise**.



Water, lower fat milk, sugar-free drinks including tea and coffee all count.

6-8 a day

oils and spreads
Choose unsaturated oils and use in small amounts.

Eat less often and in small amounts.

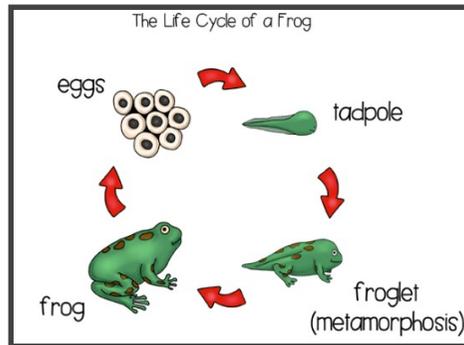


Living things and their habitats - Animal Focus

YR2 Science NC

Key Vocabulary—Habitats

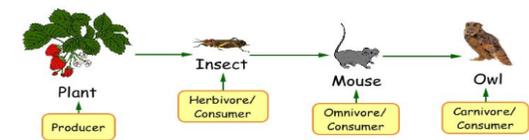
Habitat	A habitat is the natural place that something lives. A habitat provides living things with everything they need to survive such as food, shelter and water.
Microhabitat	A microhabitat is a very small habitat in places like under a rock, under leaves or on a branch. Minibeasts live in microhabitats. The microhabitats have everything they need to survive.
Depend	Many living things in a habitat depend on each other. This means they need each other for different things,
Survive	This means to stay alive.
Food source	This is the place a living thing's food comes from.
Food chain	A food chain shows how each animal gets its food. Food chains are one of the ways that living things depend on each other to stay alive.
Never living	Things made out of metal, plastic or rock were never living. They never had the life processes.
dead	Things that are dead were once living. They did have all of the life processes but don't now.
Living	Things that are living have all of the life processes.
Life processes	These are the things that all living things do. They move, breathe, sense, grow, make babies, get rid of waste and get energy from food.



Key Vocabulary—Animals

Consumer	All animals are consumers because they con-
Producer	Green plants are producers because they pro-
Predator	Animals eat other animals,
Prey	Animals that are hunted for food by other ani-
Herbivore	A animal that eats plants
Carnivore	An animal that eats other animals/insects
Omnivore	An animal that eats other animals/insects as
Adapta-tion	A special skill which helps an animal to survive and do everything it needs to do.
Basic needs	What an animal needs to survive, food, air and water
Want	Something that you want but not a necessity

The Food Chain Of An Owl



A food chain shows the path of energy from one living thing to another. Decomposers like bacteria, are necessary for all food chains.



Living things and their habitats - Animal Focus

YR2 Science NC

Key Knowledge: Habitats—Animal focus

All around us, there are some things that are alive, some things that are dead and some things that have never been alive.

All living things have certain characteristics that keep them alive and healthy.

Living things live in habitats that suit them and which provide for their basic needs.

Living things depend on other living things in order to survive.

Animals move in many different ways. Plants grow and move towards the light

Living things can detect changes in their surroundings

Living things get bigger and grow

Animals have young

A food chain shows how each animal gets its food. The chain will always start with a plant

There are many different sorts of habitats around the world from forests to grasslands and from mountain slopes to deserts.

Because the Earth is always changing, habitats are constantly changing

Animals like cockroaches are really important in a habitat—they eat the dead plants and recycle the nutrients back into the soil.

Key Knowledge: Habitats—Animal focus

Mammals—are warm blooded, they often have fur on their body, they give birth to their young and their babies often drink milk from their mothers

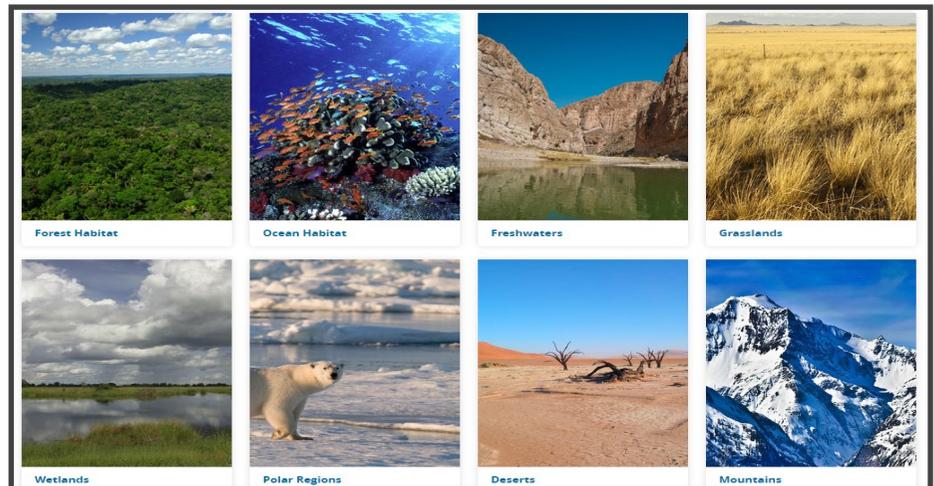
Reptiles—are cold blooded, they normally lay egg (but some don't) and they have scales.

Amphibians—are cold blooded, they have moist scaleless skin, they lay eggs.

Fish—they are cold blooded animals, they can breathe underwater using gills, fish lay eggs and fins help the fish move through water

Birds—they are warm blooded, they have feathers, wings and a beak, they lay eggs

Insects—insects have exoskeletons (hard shell like coverings of their body,) they have three main body parts and they have antennae on the top of their heads

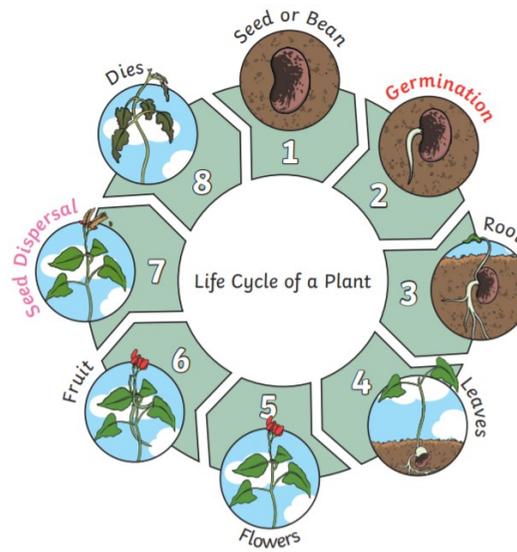


Living things and their habitats - Plant Focus

YR2 Science NC

Key Vocabulary—Trees

Root	It is the part of a plant that is usually hidden under the ground. They make the plant stable
Crown	The crown is made up of the leaves and branches at the top of the tree.
Deciduous	Deciduous trees are trees that shed their leaves in the Autumn and grow new leaves in the
Evergreen	Evergreen trees are the same as coniferous trees. They do not lose their leaves in Autumn.
Blossom	Is the mass of flowers created by a tree. Almost all fruit bearing trees have blossom. The blossom is usually at its best in the spring.
Trunk	A tree's trunk holds up its crown, protects its inner parts and works like a pipeline, transporting essential materials to the different parts of the tree.
Woodland	A woodland is a habitat where trees are the dominant plant form.
Habitat	The place where a plant or animal (mostly) lives. There are different kinds of habitats, such as grassland, forest, river, sea and desert.
Oxygen	Oxygen is used by animals and plants in the respiration (breathing) process



Key Vocabulary—Plants

Germination	When the conditions are tight the seed soaks up water and swells, and the tiny new plant bursts out
Sprout	When a plant sprouts, it grows new shoots
Shoot	A shoot grows upwards from the seed of plant to find sunlight
Seed dispersal	Seed dispersal is when the seeds move away from the parent plant. They can be moved by the wind or
Seeds	The part of a plant from which a new plant grows
Stem	The stem transports water and nutrients to different parts of the plant
Roots	The roots hold the plant to the ground and absorb the water and nutrients from the soil
Leaves	The leaves se light, air and water to make food for the plant
Petals	Petals attracts pollinators using their bright colours or unusual shapes
Bulb	The round underground part of a plant that contains food for the plant, for example an onion bulb, tulip



Living things and their habitats - Plant Focus

YR2 Science NC

Key Knowledge: Habitats—Animal focus

Plants require things such as water, warmth, nutrients from soil, light and air (carbon dioxide) to grow. If they do not have one or more of these things, they may stop growing.

Plants can: • move • grow • react to their surroundings (sense) • absorb nutrients • reproduce

To germinate, seeds need warmth, air (oxygen) and water

They don't need light to germinate because they have a store of food inside them already

The life cycle of a plant

The plant grows. • The flower comes and then dies. • A fruit with seeds is left behind. • The seeds get scattered. • The process begins again

Some plants can be eaten. Other plants are harmful to people.

Plants provide food for animals to eat.

Plants provide habitats for animals such as lush rainforests to shady

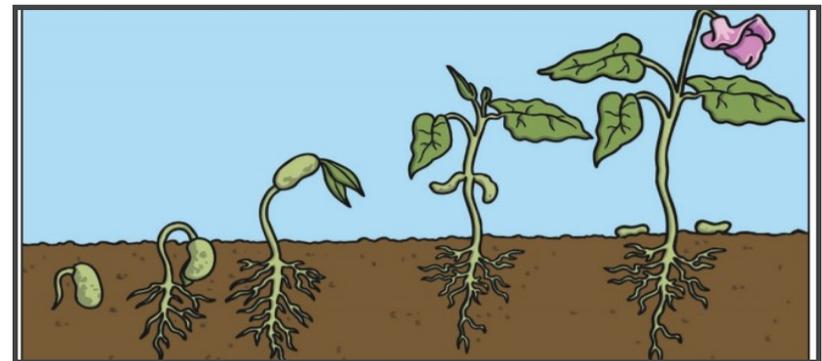
Plants provide oxygen—the air we breathe and so are important for keeping us alive,

Plants come in all colours of the rainbow. Many of them smell almost as good as they look.

Key Knowledge: Habitats—Plant focus

What do plants need to grow well?

- (1) **Sunlight**—all plants need light from the sun to grow well. Some plants need lots of sunlight. Some plants only need a little sunlight
- (2) **Water**—all plants need water to grow, without water, seeds and bulbs will not germinate
- (3) **Temperature**—this is how warm or cold something is somewhere. Some plants like cooler temperatures and some like warmer temperatures
- (4) **Nutrition**—food or nourishment. Plants make their own food in their leaves using sunlight



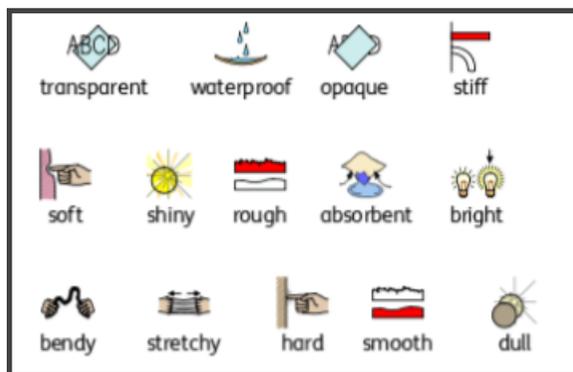


Everyday Materials

YR2 Science NC

Key Vocabulary—Materials

Material	Material is what something is made of, e.g. wood or plastic.
Wood	This is material that comes from a tree. It varies in hardness.
Plastic	A 'man-made' material that can be shaped or moulded to any shape.
Metal	A tough and strong material which can be heated and shaped into anything.
Leather	A material that is used for shoes, jackets and trousers.
Wool	A material that is used for jumpers, socks,
Cotton	A material that is used for clothes that we
Fabric	Materials such as denim, felt and velvet.
Brick	Bricks are very hard and strong. They are difficult to break. They are thick and store heat well
Cardboard	This is often thin but it is firmer and tougher than paper. Cardboard is more difficult to tear



Key Vocabulary—Properties of Materials

Stretchy	A stretchy material is one that is like elastic.
Stiff	A stiff material is firm and hard and not flexi-
Bendy	A bendy material is one that can be twisted
Water-proof	Is a material that does not allow water or liquid through
Shiny	A shiny material is sparkly or glossy and some-
Dull	A colour or light that is not bright.
Flexible	Able to bend easily without breaking.
Soft	Not hard or stiff
Hard	Something that is solid, firm, and rigid; not
Transpar-ent	A material that will allow light to travel through. You can see through it.
Opaque	A material that does that allow light to travel
Rough	Something that is uneven and not smooth
Smooth	No roughness, lumps, or holes
Absorbant	A materials that soaks up water



Everyday Materials

YR2 Science NC

Key Knowledge: Materials

Recycle means using things that have already been used, to make new things. Over 55% of our rubbish at home could be recycled.

Some plastics can take up to 500 years to decompose.

Glass is 100% recyclable and can be recycled repeatedly.

Some materials are natural while others are man-made.

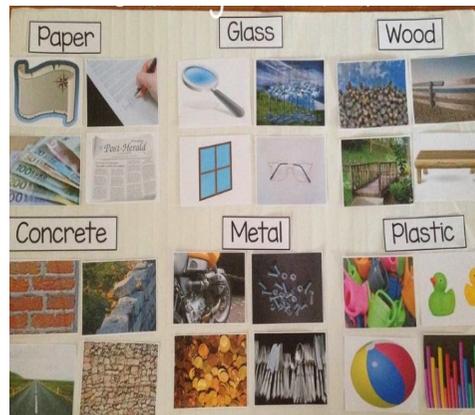
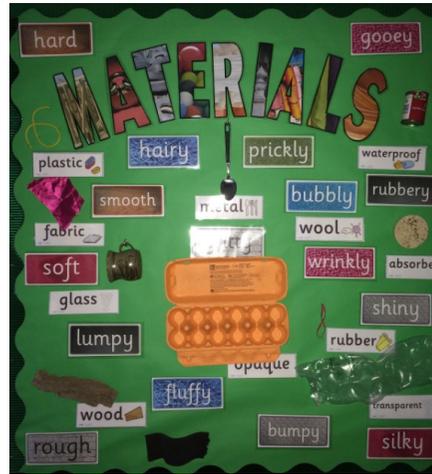
Natural materials are materials which are found in nature.

Man-made materials are materials which have been produced by humans.

The property of a material is something about it that we can measure, see or feel and helps us to decide whether or not it is the best material for the job,

Materials can be put into groups according to their properties

Most materials have more than one property and can be natural, man-made, strong, weak, heavy, light in weight, rough, smooth, shiny, dull, hard, soft, flexible, brittle, magnetic, non-magnetic, transparent, opaque, electrical conductor, electrical insulator, conductor of heat, thermal (heat) insulator, burns when heated, does not burn, melt easily or not melt easily.



Key Knowledge: Materials

The shape of solid objects can be changed by squashing, bending, twisting and stretching

Materials exist in three states: a solid, a liquid or a gas. Materials can sometimes be changed from one state to another, perhaps by heating them – for example, ice is a solid which becomes a liquid when

On average every UK family uses around 330 glass bottles and jars every year. Glass bottles and jars can easily be recycled to make new glass bottles and jars or used in industry as aggregate (building mate-

Materials can be sorted according to their properties

Different types of matter have different material properties that make them useful for different jobs. A plastic hosepipe is flexible, so it can be pointed in any direction. A Perspex visor is transparent, so the wearer can see straight through it. A firefighter's suit is shiny so it can reflect heat and light. Flexibility, transparency, and shininess are three examples

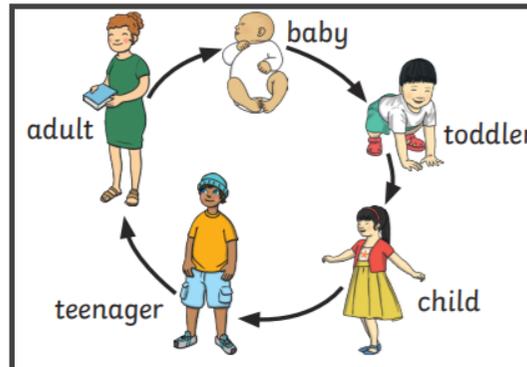


Animals inc. Humans - Human Focus

YR2 Science NC

Key Vocabulary—Humans

Hygiene	Good hygiene will help you to stay healthy and not become poorly. Having good hygiene includes washing hands, covering your mouth when you cough, having regular showers or
Needs	Humans have basic need that they have to have to survive—water, food, oxygen, shelter and the
Adult	A fully grown animal or plant.
Off-spring	You can refer to a person’s children or an animal’s young as their off-spring.
Develop	To grow and become stronger.
Young	Babies or offspring that have not reached adulthood.
Survival	Survive usually means to succeed in keeping alive against odds.
Nutrition	Nutrition is the process by which the body nourishes itself by transforming food into energy and
Life cycle	The changes living things go through to become an adult
Germs	Bugs that cause disease and illness.
Disease	Illness or sickness.
Exercise	A physical activity to keep your body fit.



Key Vocabulary– Healthy Living

Healthy	Keeping healthy means doing things that are good for your body – things like eating nutritious foods, exercising, brushing your teeth and getting enough sleep
Balanced diet	Eating a balanced diet means choosing foods in the right amounts from each of the food
Exercise	Means to keep your body healthy by running, walking and playing. You will need to feel out
Proteins	Protein is a food group which includes meat, eggs, fish, dairy products, nuts and seeds
Carbohydrates	Carbohydrates are sugars (such as fructose, glucose, and lactose) and starches, which are found in foods such as starchy vegetables, grains, rice, breads, and cereals.
Fats	Fats are found in meat and other animal products, such as butter and cheese.
Nutrition	Nutrition is the process by which the body nourishes itself by transforming food into en-

To stay alive, all animals have 3 basic needs:





Animals inc. Humans - Human Focus

YR2 Science NC

Key Knowledge: Animals—human focus

Animals including humans, have babies that look like them.

Babies will grow into adults

Humans need things to survive (including food and water).

It is important for humans to keep clean and wash regularly.

It is important for humans to eat the right amounts of food.

It is important for humans to exercise.

Key Knowledge: Animals—human focus

It's important not to eat too much sugar and salt: sugary foods are bad for your teeth and can be fattening, and salty foods can lead to heart disease.

Keep your mouth happy by brushing and flossing to have healthy teeth and gums.

Everyone should have their '5 a day' – this means five portions of fruit and vegetables, to get the right amount of nutrients.

Keeping healthy means caring for your body so you have enough energy to learn, play and grow.

All foods contain nutrients which your body needs to stay active throughout the day. Some foods have more nutrients than others.

It's important to have 30-60 minutes of exercise every day. This can include running around and playing games with friends.

Taking Care of Yourself

<p>Sleep Early to bed, early to rise. Plenty of sleep helps you concentrate.</p>	<p>Teeth Brush teeth every morning and night to keep them shining and bright. Visit your dentist regularly.</p>
<p>Nails Trim nails weekly. Keep nails short and clean.</p>	<p>Hair Wash your hair often. Keep it neat by styling and brushing.</p>
<p>Exercise Play outside as much as possible. Don't sit and play on the computer or watch TV too often.</p>	<p>Hygiene Bath or shower and change underwear daily. Wash hands after visiting the toilet and before eating.</p>
<p>Homework Take care with homework and always do it before going out to play.</p>	<p>Diet Eat a healthy balanced diet. Choose healthy snacks such as fruit instead of crisps and sweets. Avoid sweet, fizzy drinks. Drink water, milk or fresh fruit juice.</p>

To grow into a healthy adult, we must eat the right types of food in the right amount and **exercise**.

Eatwell Guide

fruit and vegetables carbohydrates

proteins dairy and alternatives

oils and spreads
Choose unsaturated oils and use in small amounts.

Water, lower fat milk, sugar-free drinks including tea and coffee all count.

6-8 a day

Eat less often and in small amounts.

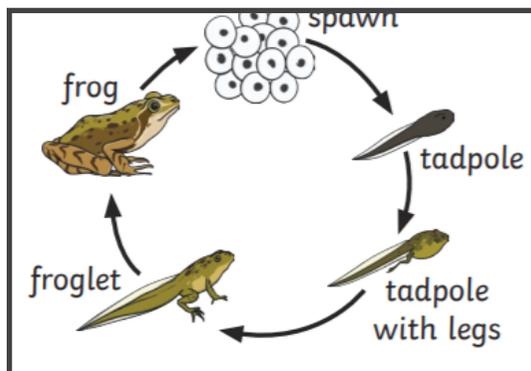


Animals inc. Humans - Animal Focus

YR2 Science NC

Key Vocabulary—Animals

Needs	Animals have basic need that they have to have to survive—water, food, oxygen, shelter and the correct temperature.
Adult	A fully grown animal or plant.
Off-spring	You can refer to a person's children or an animal's young as their off-spring.
Develop	To grow and become stronger.
Young	Babies or offspring that have not
Survival	Survive usually means to succeed
Nutrition	Nutrition is the process by which the body nourishes itself by transforming food into energy and body tissues.
Life cycle	The changes living things go
Live young	Offspring that has not hatched
Reproduce	When living things make a new
Adaptation	A special skill that an animal has to allow it to survive and live in its habitat.



Key Vocabulary— Animals

Amphibi-ans	Amphibians live in water as babies and on land as they grow older. They have smooth, slimy skin.
Birds	All birds have a beak, two legs, feathers
Fish	Fish live and breathe under water. They have scaly skin, fins to help them swim and they breathe through gills.
Mammals	Mammals are animals that breathe air, grow hair or fur and feed on their mother's milk as a baby
Reptiles	All reptiles breathe air. They have scales
Carnivore	Animals that mostly eat other animals
Herbivore	Animals that only eat plants
Omnivore	Animals that eat both plants and other animals
Food chain	A food chain shows how each animal gets its food. A food chain always starts with a green plant.



Animals inc. Humans - Animal Focus

YR2 Science NC

Key Knowledge: Animals

Animals need things to survive water, food, air and shelter.

All animals reproduce and have off spring.

Some animals lay egg which hatch into live young. This young then develops into an adult. When these eggs hatch, some animals look like their adult, e.g. birds and reptiles.

Other animals have offspring which don't look like them e,g, fish and amphibians

Most animal babies need to be fed and cared for by their adults

Key Knowledge: Animals

Animals live in habitats that suit them best -

- A fish can breathe and swim is it lives in water.
- A worm has brown skin, bristles on its underside and a pointed head and this means that soil is a good habitat for hem to live in
- Polar bears have thick white fur to keep it warm and camouflaged to allow it to live in a cold habitat
- A desert rat has large ears to help it to lose excess body heat and has good eyesight so it can hunt at night when it is dark. It has adapted live in a hot habitat
- An otter's eyes and nostrils can close under water to allow ot to live in a wet habitat. It also has webbed feet to allow it to move in the water

Some common carnivores—lion, tiger and brown bear.

Some common herbivores—cow, sheep and rabbit.

Some common omnivores—human, pig and rat.

Polar Bear

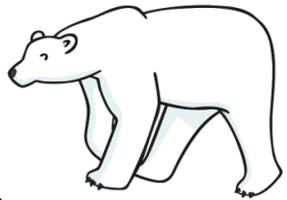
 Polar bears live in the Arctic.

 Polar bears large feet stop them sinking into the snow.

 Polar bears have white fur so that they blend into their habitat.

 Their fur is very thick to keep them warm.

 Polar bears have sharp claws for catching their prey and gripping to the ice.



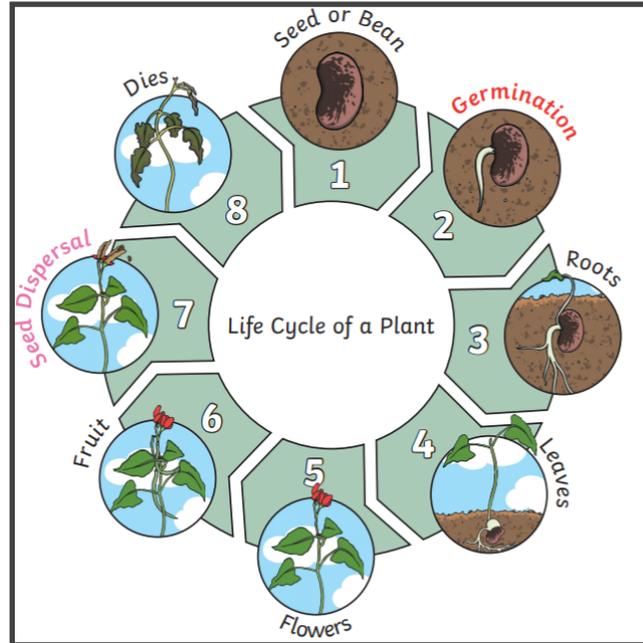


Plants

YR2 Science NC

Key Vocabulary—Plants

Plant	Plants are a large group of living things that use sunlight to make their own food. There are many different kinds of plants including trees, vines and grasses
Germination	When the conditions are right, the seed soaks up water and swells. Then the tiny new plants bursts out of its shell. This is called germination
Sprout	When a plant sprouts, it grows new shoots.
Shoot	A shoot grows upwards from the seed or plant to find sunlight.
Seed dispersal	Seed dispersal is when the seeds move away from the parent plant. They can be moved by the wind or by animals.
Life cycle	Plants have a clear life cycle that helps them to keep growing.



Key Vocabulary— Plants

Seeds	The part of a plant from which a new plant grows
Roots	Hold the plant to the ground and absorb
Stem	Transports the water and nutrients to different parts of the plant.
Leaves	Use light, air and water to make food or the plant.
Flower	The part of the plant that blossoms. Flowers produce seeds that form new plants
Bulb	The round underground part of a plant that contains food for the plant. Common bulbs include onion, tulip and daffodil bulb.



Plants

YR2 Science NC

Key Knowledge: Plants

The main parts of a plant are flowers, leaves, stem and the roots

To grow and survive plants need light, water and carbon dioxide so they can make their own food. They also need warmth because if a plant gets too hot or too cold it will die

The life cycle of a plant

The plant grows

The flower comes and then it dies

A fruit/flower is left behind

The seeds get scattered

The process begins again



Key Knowledge: Plants

What do plants need to grow well?

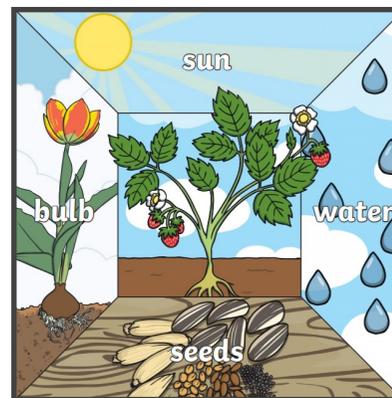
Sunlight—all plants need light from the sun to grow well. Some plants need a lot of sunlight and some plants only need a little.

Water—all plants need water to grow. Without water, seeds and bulbs will not germinate.

Temperature—temperature is how warm or cold something or somewhere is. Some plants like cooler temperatures and some like water temperatures.

Nutrition—food or nourishment. Plants make their own food in their leaves using sunlight

When a seed starts to grow it is called germination. To germinate a seed needs warmth, air and water. Seeds don't need light because they already have a store of food inside them. Once the stem breaks through the soil it is then a plant.





Forces and Magnets

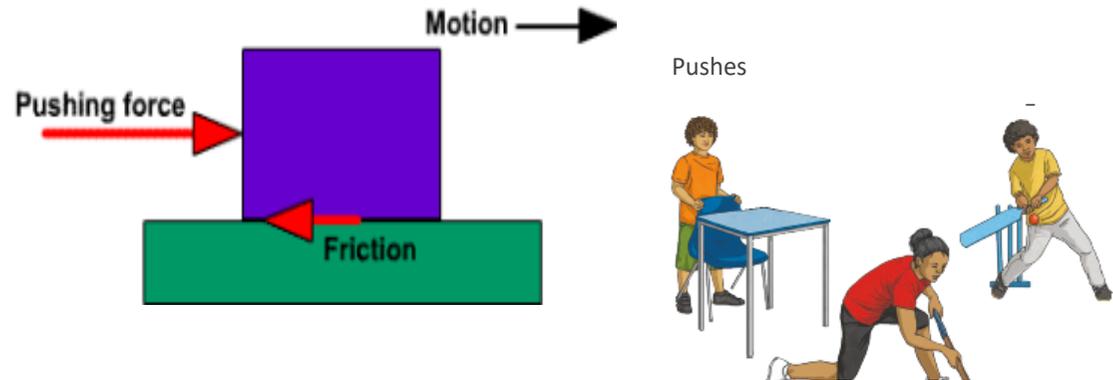
Y3 Science NC

Key Vocabulary

Force	A push or pull on an object which can cause it to move, change speed, direction or shape. Measured in Newtons (N).
Friction	The resistance of motion when one object rubs against another. Friction causes objects to slow down and the energy becomes heat.
Surface	The top layer of something.
Magnet	A material or object that produces a magnetic field. It attracts or repels magnetic objects, including iron.
Magnetic	Objects which are attracted to a magnet are magnetic. These contain iron, nickel or cobalt.
Magnetic field	The area around an object where there is a magnetic force that will pull magnetic objects towards the magnet.
Poles	The positive and negative opposite ends of a magnet.
Repel	To push away. Opposite of attract.
Attract	To pull towards. Opposite of repel.
Gravity	Gravity attracts all objects towards each other. Gravity has been around since the very beginning of the universe, and it works the same way everywhere in the universe, on all kinds of different objects, of all different sizes

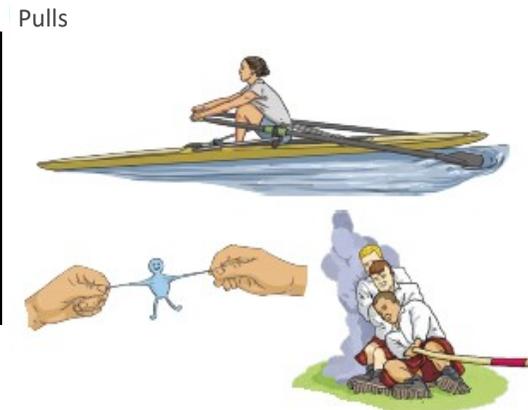
Key knowledge

Different surfaces create different amounts of friction. The amount of friction created by the moving object over the surface depends on the roughness of the surface, the object and the force between them.



Key knowledge

Forces change the motion of objects. Pushes or pulls make objects start to move, slow down or stop completely.





Forces and Magnets

Y3 Science NC

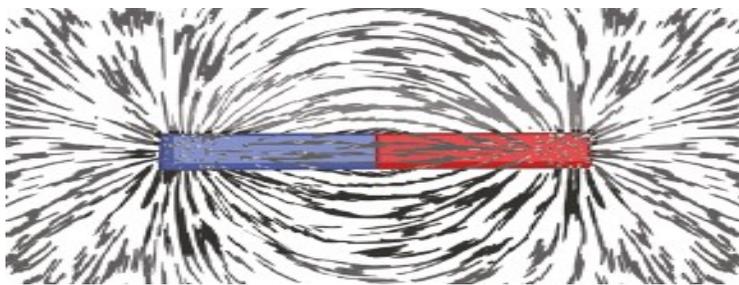
Key Knowledge

Magnets have two poles - one negative and one positive.

When two magnets are placed together, like poles (two of the same, e.g. positive and positive) repel and opposite poles (two different ones, e.g. negative and positive) attract.

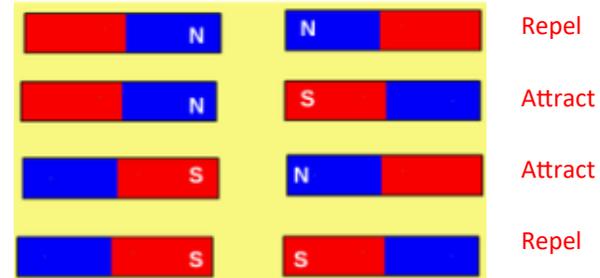
The positive and negative poles of a magnet are sometimes called north and south poles. The Earth is a giant magnet with a north and south pole and its own magnetic field.

The magnetic field of any magnet is invisible but its effects can be seen when you sprinkle iron filings on a piece of paper and place a magnet beneath: you will see them move.



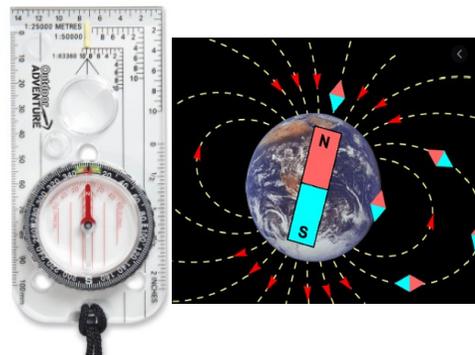
Key Knowledge

Like poles repel. Opposite poles attract.



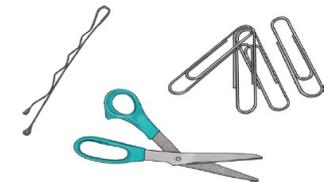
Key Knowledge

The needle in a compass is a magnet, always pointing the north-south axis.



Key Knowledge

Magnetic:



Non-magnetic:





Rocks, soil and fossils

Y3 Science NC

Key Vocabulary

<i>Rock</i>	A hard, solid material that is made of minerals and is found in nature.
<i>Soil</i>	The top layer of the ground, in which plants grow; dirt.
<i>Mineral</i>	A solid, natural material that does not come from a living thing.
<i>Metamorphic rock</i>	Rock formed when any type of rock goes through changes caused by extreme heat and pressure (e.g. marble, slate).
<i>Igneous rock</i>	Rock formed by the cooling and hardening of hot magma or lava. Formed by volcanoes! (e.g. basalt, granite).
<i>Sedimentary rock</i>	Rock formed when sediment is pressed together over time. Formed over a long period of time (e.g. shale, limestone, sandstone).
<i>Rock cycle</i>	The series of changes that rock undergoes over time as it shifts between different types.
<i>Fossil</i>	The remains of a plant or animal that turned to stone over a long period of time. Mostly found in sedimentary rock.
<i>Weathering</i>	The process of wearing away or otherwise changing Earth's surface, caused by natural forces.
<i>Erosion</i>	The process of transporting and wearing away rocks or soil as loose articles that are moved by water, wind, ice or gravity.
<i>Bedrock</i>	The solid rock underneath soil or loose rocks; the lowest of three main layers of soil.
<i>Subsoil</i>	The middle layer of soil, which contains more rocks than topsoil.

Key knowledge

Igneous rocks:

rocks that form when lava cools creating crystal structure rocks.

Metamorphic rocks:

formed when other rocks are affected by great temperature and pressure.

Sedimentary rocks:

formed by layers of sediment collecting and solidifying, these rocks will have

TYPES OF ROCKS

IGNEOUS		SEDIMENTARY		METAMORPHIC	
					
Granite	Scoria	Sandstone	Limestone	Marble	Slate
					
Pumice	Obsidian	Shale	Gypsum	Quartzite	Gneiss

Rocks, soil and fossils

Y3 Science NC

Key Knowledge

Fossils may be formed in the following ways:

Amber - Insects are often found preserved in hardened tree sap called amber.

Carbonization - when all the elements of the organism have dissolved apart from carbon leaving an outline.

Casts and moulds - When an organism dissolved in the earth, a hollow mold is sometimes left behind. It is then filled by minerals.

Freezing - preserved in ice, especially in glaciers.

Mummification - When a dead organism quickly dries out the remains can be pre-

An animal dies. It gets covered with **sediments** which eventually become rock.

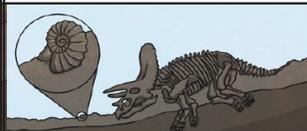
More layers of rock cover it. Only hard parts of the creature remain, e.g. bones, shells and teeth.



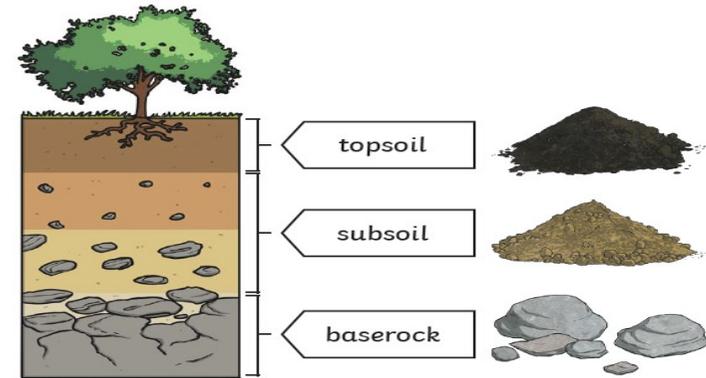
Over thousands of years, **sediment** might enter the mould to make a **cast fossil**. Bones may change to mineral but will stay the same shape.

Changes in sea level take place over a long period.

As **erosion** and weathering take place, eventually the fossil becomes exposed.



Key Knowledge



Soil is the uppermost layer of the Earth. It is a mixture of different things:

Mineral (finely ground down pieces of rock), air, water and organic matter (including living and dead plants and animals).

Why is soil important?

1	Plants	Nutrients in soil help plants to grow & anchor roots in the ground.
2	Atmosphere	Soil releases gases such as carbon dioxide in to the air.
3	Living Organisms	Many animals, fungi & bacteria live in soil.
4	Nutrient cycles	Soil is important in recycling nutrients.
5	Water	Soil helps to filter and clean water.



Light

Y3 Science NC

Key Vocabulary

Light source	An object that produces its own light (e.g. sun, fire).
Reflection	When a light hits a surface and 'bounces' off.
Refraction	When light passes through a different object and its direction changes.
Opaque	An object which does not allow light to pass through it (e.g. wood).
Translucent	An object which allows some light to pass through it. It may be possible to see some unclear images
Transparent	An object which allows light to pass through it so that objects behind it can be easily seen (e.g. glass).
Spectrum	A range of colours caused when white light is refracted. A rainbow shows a spectrum of colours.
Rainbow	An arch of colour caused by the refraction of light on water droplets in the air, usually rain (Red, Or-
Prism	A solid 3D shape where two end faces are similar and parallel.
Shadow	A dark area or shape caused by the blockage of light.

Key knowledge

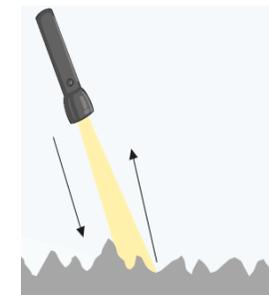
We need light to be able to see things. Light travels in a straight line. When light hits an object it is reflected and bounces off. If the reflected light hits our eyes we can see the object. Some surfaces and materials reflect light well and others do not. Reflective surfaces and materials can be very useful e.g. high-vis jackets and cats' eyes in the road.



Mirrors reflect light well and so they create a clear image. An image in a mirror appears to be reversed.



When the light rays hit the smooth mirror, they all bounce off at the same angle, creating a clear reflection.



When the light rays hit a rough surface, they scatter in all different directions, so it doesn't reflect well.



Light

Y3 Science NC

Key Knowledge

Light travels in a straight line

Light travels faster than sound.

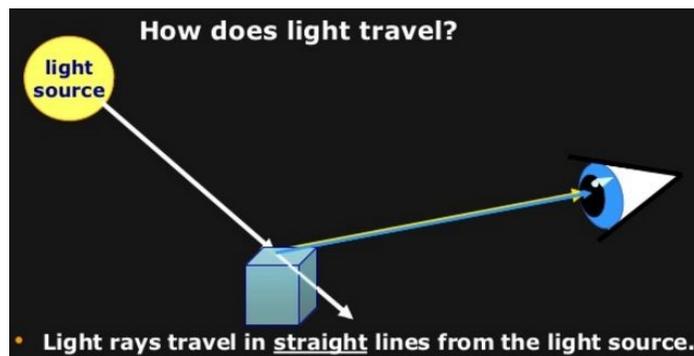
A light year is a unit of measurement for distance. It is the distance light can travel in a year.

The size and shape of a shadow changes based on the distance and angle compared to the light source.

Darkness is caused by the absence of light.

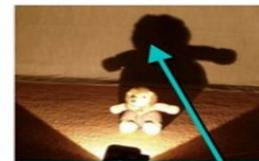
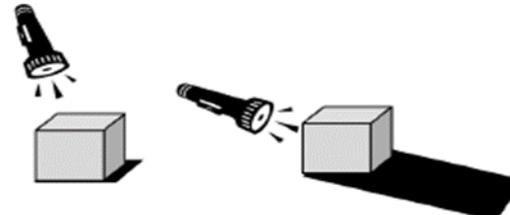
The moon does **not** emit its own light – it reflects the sun.

Ultraviolet (UV) light is a type of radiation which you can't see but can be dangerous. UV rays can come from the sun.

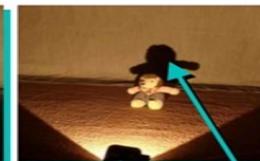


Key Knowledge

As the light source moves higher in relation to the object, the shadow gets shorter. As the light source moves lower the shadow gets longer.



LARGE SHADOW
when the toy is
close to the light



SMALLER SHADOW
when the toy is further from
the light



TINY SHADOW
when the toy is a
long way from the
light

When white light passes through a glass prism, it is refracted. The light changes direction and is then dispersed (spread out) as it exits the prism. Depending on the shape of the prism and the angle of the light, we can often see the spectrum of colours.

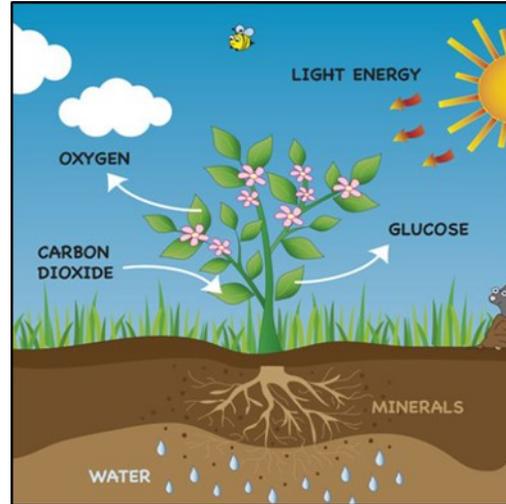


Plants

Y3 Science NC

Key Vocabulary—Flowering Plants

Roots	Anchor the plant in the ground and absorbs water and nutrients from the soil.
Stem	Transports water and nutrients to different parts of the plant.
Leaves	The place where photosynthesis takes place.
Petal	The separate leaves that form the outside part of a flower and usually attract insects.
Flower	The part of a plant that allows it to reproduce.
Seed	The part of a plant that can grow into a new plant.
Pollen	The substance that causes plants to form seeds.
Ovule	Ovules produce the female reproductive cells which get fertilized during reproduction in seed plants.
Stamen	The part of the flower that produces pollen.
Pistil	The female part of the flower. It contains the carpel and the stigma.
Nutrient	A substance that is needed for healthy growth, development, and functioning
Pollination	Pollen produced by a flower is carried by insects or blown by the wind to another flower.
Fertilisation	When the pollen reaches another flower, it travels to the ovary where it fertilises the egg cells to make seeds.



Key knowledge

Plants need air, light, water, nutrients, temperature and space in order to live and grow. The amounts needed of each of these requirements varies from plant to plant.

-A plant that is kept in a dark place will grow tall and spindly, as it searches for light.

-A plant that is not watered will have a weak stem. Its leaves will dry up and eventually it will die.

-A plant that is not given enough space will have stunted growth, and may die if it cannot reach enough light.

-A seed will not germinate at all if the temperature is too cold.

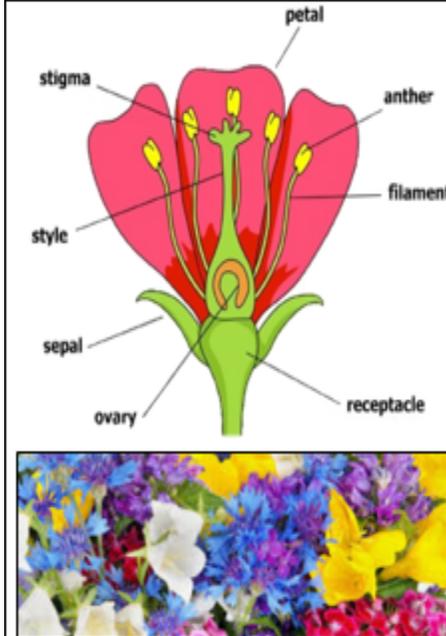
Plants

Y3 Science NC

Key Knowledge: Functions of Plant Parts

 <p>Roots</p> <ul style="list-style-type: none"> -The roots grow into the ground. They are responsible for pulling water and minerals to the plant. -They expand into the ground to widen the area they can find water. They also help to anchor the plant into the ground. 	 <p>Stem/Trunk</p> <ul style="list-style-type: none"> -The stem/trunk carries the water and nutrients up to the leaves. -The stem also carries food from the leaves to the rest of the plant. -Stems grow upwards, reaching up for the sun.
 <p>Leaves</p> <ul style="list-style-type: none"> -Leaves are responsible for catching sunlight. They also allow both air and water to enter the plant. -Leaves have veins inside them, to allow water and nutrients to flow. There are many different sizes & shapes of leaves, to fit the plant's needs. 	 <p>Flowers</p> <ul style="list-style-type: none"> -Flowers are the parts of plants that are responsible for making both food and seeds. -The petals of a flower attract insects for pollination. The flower has male and female parts, which work together to make seeds.

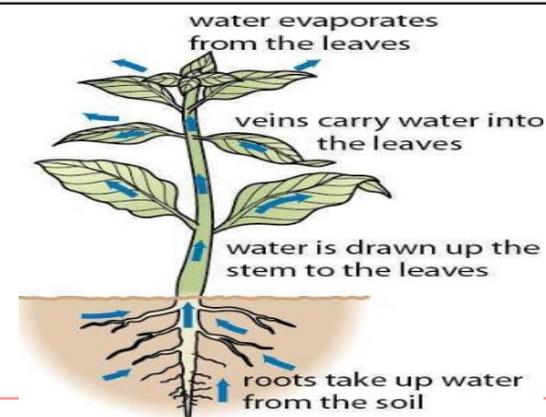
Key Knowledge: Flowers



- Flowers play an important role in the reproduction of plants.
- The male part of a flower is called a stamen – it is made up of a filament and an anther. The anther contains pollen.
- The female part of a flower is called a carpel. It is made of a stigma, a style and an ovary.
- When the male pollen lands on the female stigma pollination occurs.
- This process means that a seed is produced.
- Insects are drawn to flowers by bright petals. When they feed on the flower's nectar they are dusted with pollen. They then spread this to other places when they leave.

Key Knowledge: How Water Is Transported In Plants

- Water is found in the soil by the roots.
- The water is drawn up from the roots to the stem.
- The water travels up small tubes in the stem called xylem.
- Water reaches the leaves and flowers, keeping them hydrated.
- Water escapes from the plant as vapour (a gas) through tiny holes.





Animals including humans

Y3 Science NC

Key Vocabulary

Skeleton	Keeps the body in shape, protects organs and helps movement.
Heart	Muscle that pumps blood around the body.
Joints	Area where two bones meet.
Consumers	Eating food you cannot create yourself..
Muscle	Attached to the bone and are responsible for movement.
Posture	The position in which a person sits or stands.
Nutrients	Substances that help plants and animals grow.
organs	Tissues in the body that perform functions.
Vitamins	Substances found in foods that keep you healthy.
Digest	When food in the stomach is broken down.
tendon	A strong cord in an animal's body that joins a muscle to a bone.

Key knowledge

Living things need food to grow and to be strong and healthy. Plants can make their own food but animals cannot. To stay healthy, humans need to exercise, eat a healthy diet and be hygienic. Animals including humans need food, water and air to stay alive.

Type of Food Group	Function	Examples
Carbohydrates	Helps your body work properly	
Protein	Needed for chemical reactions in our body	
Vitamins & Minerals	Helps your body grow and repair itself	
Fats and Oils	Acts as an energy store	
Fibre	Gives you energy	
Water	Cleans our digestive system	



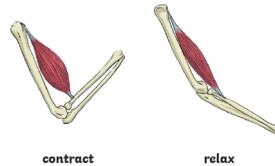
Animals including humans

Y3 Science NC

Key Knowledge

Skeletons do three important jobs:

- protect organs inside the body
- allow movement
- support the body and stop it from falling on the floor.

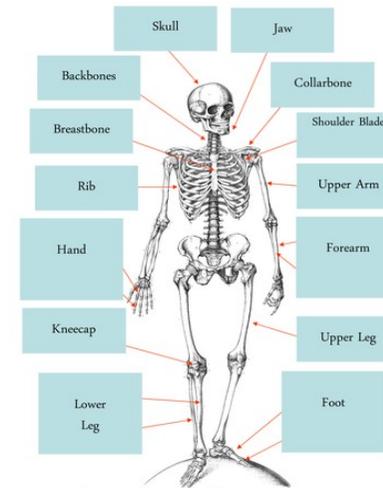
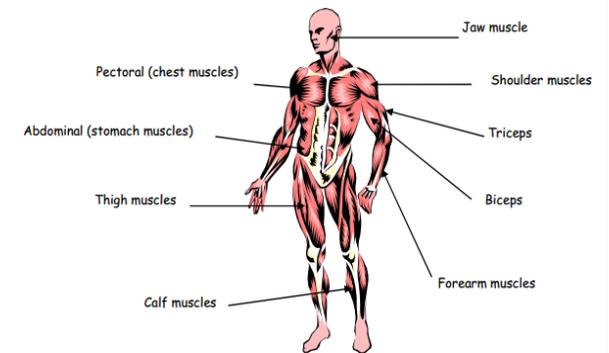


Skeletal muscles work in pairs to move the bones they are attached to by taking turns to contract (get shorter) and relax (get longer).

Muscles contract and relax in response to nerve signals. This is how we move. Muscles stretch without damage and are able to return to their original resting shape and length. Muscles are grouped into skeletal muscle, smooth muscle and cardiac muscle. Skeletal muscles lie directly below the skin, and are responsible for most voluntary movement. Skeletal muscle is made up of bundles of long fibres, which in turn are made up of elongated muscle cells. They are attached to bone by tendons. When they contract, they pull on bones, making them move at joints. They work in pairs, one contracting and one relaxing. The heart is made up of branching fibres and provides involuntary movement in the form of heart beats. All muscles require energy to work. Oxygen and glucose are delivered to the muscle cells by blood vessels. The muscle cells convert this to energy. If muscle cells do not get enough oxygen, they respire anaerobically which leads to the build up of lactic acid. This is why you ache after a workout, and why you get cramps. Muscles get tiny tears, then the body repairs and it gets bigger and stronger. Exposure to higher workloads means more tears and repairs. Muscle wasting comes from disease or lack of activity. Fast twitch muscle fibres respond quickly (sprinter's legs), but use more energy and tire quicker.

Key Knowledge

Some of the body's main muscle groups



Some of the bones in the human skeleton.

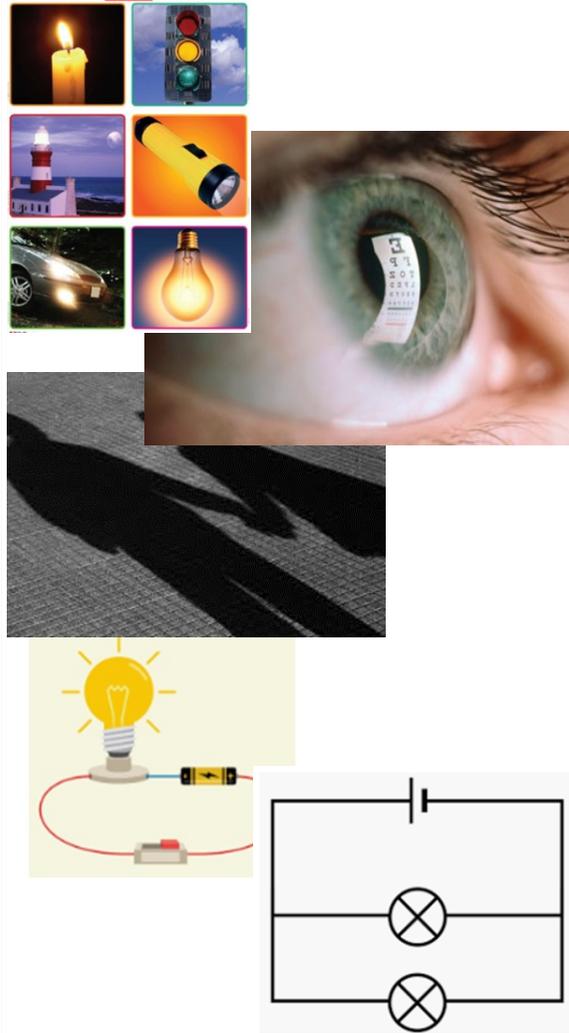


Light and Electricity

Light Y3 Science NC & Electricity Y4 Science NC

Key Vocabulary—Light

Opaque	Can't see through it, light can not pass
Transparent	Can see through it, light can easily pass
Translucent	Light can pass through it but can not fully
Shadow	A dark area or shape produced by an object coming between rays of light and a surface.
Reflect	Throw back light without absorbing it. To
Reflector	A piece of glass or metal for reflecting
Reflection	An image seen in a mirror or shiny sur-
Sources	A place or thing from which something
Light	The thing that makes sight and makes
Dark	With little or no light.
Natural	Existing in or derived from nature; not
Artificial	Made or produced by human beings rather than occurring naturally, especially as a copy of something natural.
Travels	Go or be moved from place to place.



Key Vocabulary—Electricity

Insulator	Something which does not allow electrici-
Conductor	Something which does allow electricity to
Battery/Cell	A container consisting of one or more cells, in which chemical energy is converted into electricity and used as a source of power.
Circuit	A complete and closed path around which
Mains	The source of public electricity supply
Power Source	The place providing electricity.
Buzzer	An electrical device that makes a buzzing
Electrical	Operated by or producing electricity.
Switch	A device for making and breaking the con-
Electricity	A form of energy .
Motor	Makes things move when electricity is
Bulb	A source of light.
Parallel	Side by side and having the same distance
Danger	The possibility of suffering harm or injury.



Light and Electricity

Light Y3 Science NC & Electricity Y4 Science NC

Key Knowledge: Light

Black and dark objects absorb light and heat whilst white or light objects reflect it.

Some objects like glass are transparent which means that light can pass through them.

Our main source of light on Earth comes from the Sun. A ray of light travels very fast.

Darkness is made by blocking light from the sun or some other source of light, which makes shadows.

The Sun and other stars, fires, torches and lamps all make their own light and so are examples of sources of light.

A mirror is not a source of light it merely reflects light. Similarly, the Moon is not a source of light it reflects the light from the Sun.

Some animals are nocturnal. They are awake at night and can see very well in the dark. Our eyes aren't designed to see in the night.

We need to protect our eyes from the sun as it can damage our sight.

Light is measured in 'waves' and the light that we can see is only a small portion of the types of light. Light is an energy beam that moves in wavelengths.

Light will travel in a completely straight line until it hits an object that will bend it. The light that is in a straight line are called 'light waves'.

Light is used by plants to convert the light into energy as their 'food'.

Key Knowledge: Electricity

Electricity comes from the power station, the wind, the sun and water.

Electricity is a type of energy that build up in one place (static), or flow from one place to another (current electricity).

Coal is the biggest source of energy for producing electricity. Coal is burned in furnaces that boils water and creates steam.

A popular way of generating electricity is through hydropower. This is a process where electricity is made by water which spins turbines attached to generators.

Electricity comes from the power plant through underground or overhead lines to your home. It enters your home through a service box that keeps track of how much electricity you use. When you plug an appliance into an outlet in the wall, electricity flows into the appliance to make it work.

Electricity needs a complete circuit to provide power. If a circuit is broken, then this stops the electricity reaching its destination

The more appliances, the greater the amount of electricity needed.

There are electrical symbols used in electricity.



Battery



Wire



Bulb



Buzzer



Motor



Switch (off)



Switch (on)

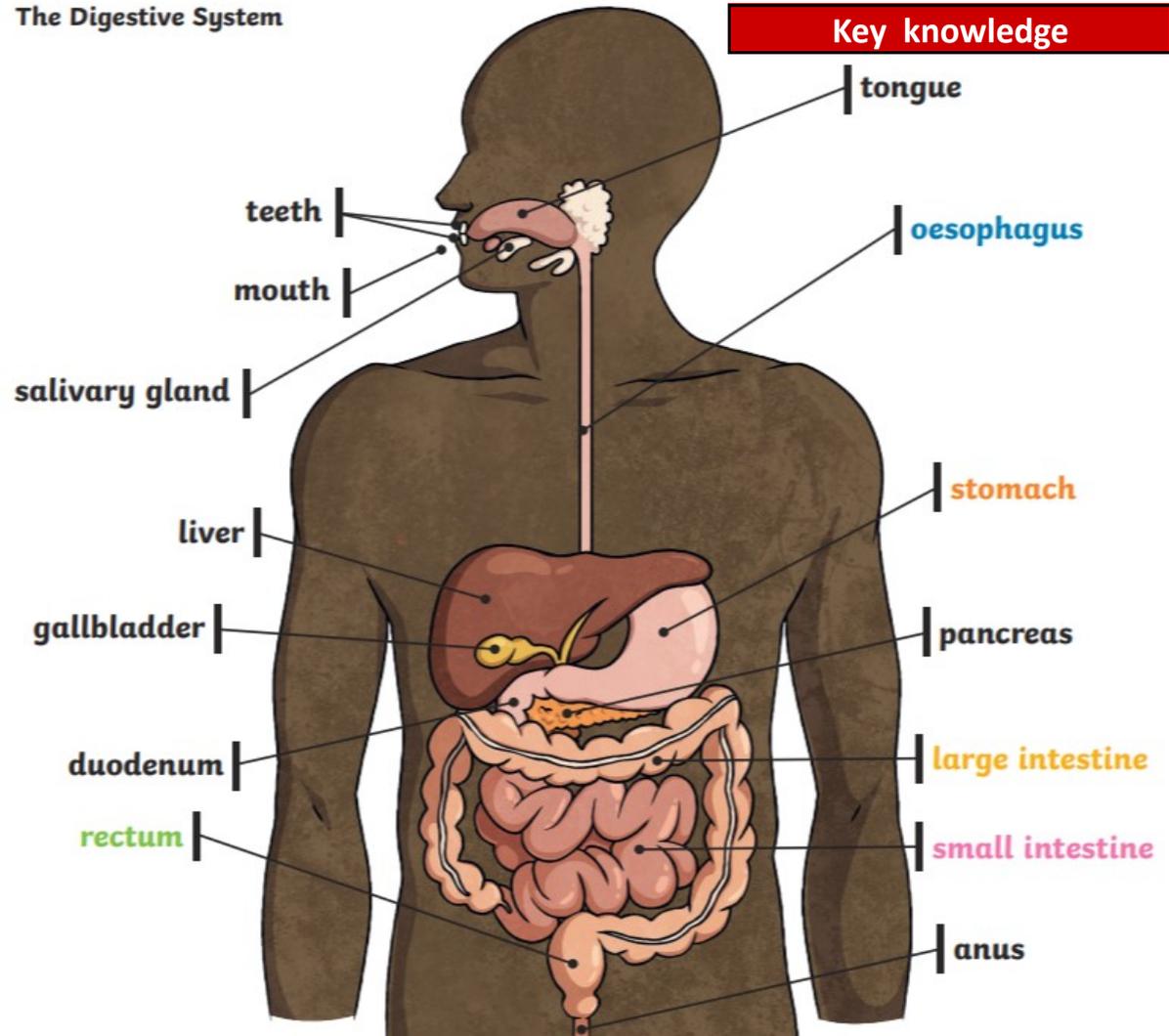
Animals including humans.

Y4 Science NC

Key Vocabulary—	
digest	Break down food so it can be used by the
oesophagus	A muscular tube which moves food from
stomach	An organ in the digestive system where food is broken down with stomach acid and by being churned around.
small intes-	Part of the intestine where nutrients are
large intestine	Part of the intestine where water is absorbed from remaining waste food. Stools are formed in the large intestine.
rectum	Part of the digestive system where stools are stored before leaving the body through the anus.

Key knowledge	
The digestive system is the break down of food into smaller and smaller parts until they can be absorbed by the body and used for growth and repair.	
The journey of food starts in the mouth with teeth and tongue breaking down the pieces of food then pushing it down the oesophagus to begin the journey through the digestive tract.	

The Digestive System



Animals including humans.

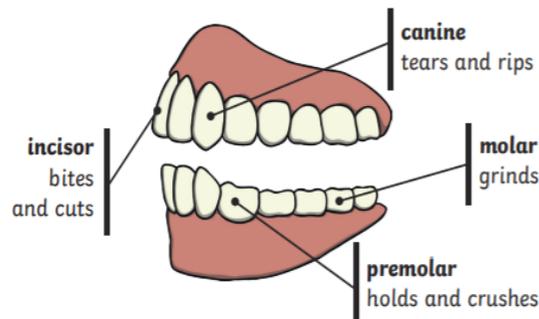
Y4 Science NC

Key Vocabulary—

herbivore	An animal that eats plants.
carnivore	An animal that feeds on other animals.
omnivore	An animal that eats plants and animals.
producer	A plant that produces its own food
predator	An animal that hunts and eats other animals.
prey	An animal that gets hunted and eaten by

Key knowledge—

Human Teeth and Their Functions

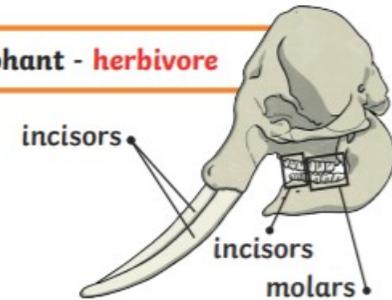


Some people have wisdom teeth but they have no function now.

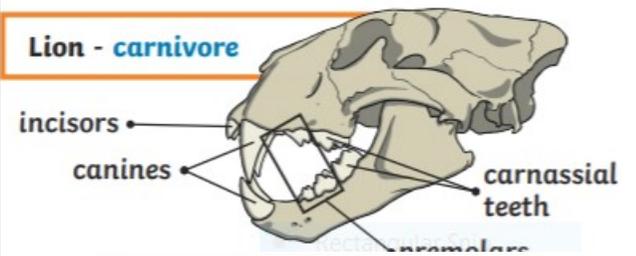
Key knowledge—

The teeth of an animal are designed to eat different foods depending on the diet of the animal. Examples of a herbivore, a carnivore and an omnivore skull.

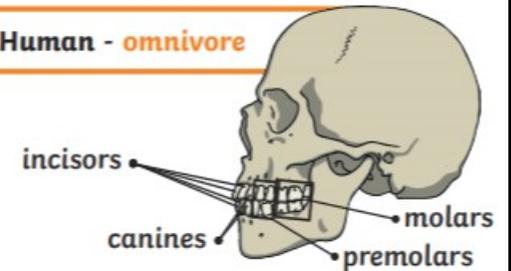
Elephant - herbivore



Lion - carnivore

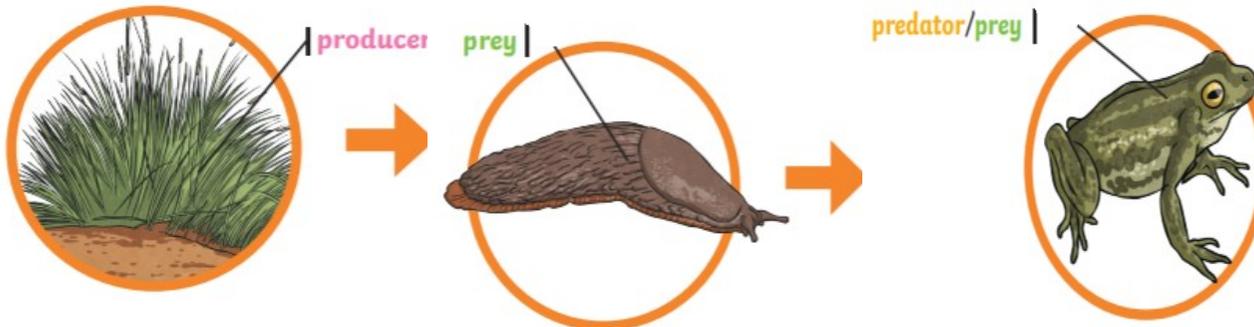


Human - omnivore



Key knowledge—

A food chain will always start with a plant. This is called the producer. The arrow points towards the next stage in the chain. The first animal in the food chain is a herbivore as it only eats plants.





Living things and their habitats

Y4 Science NC

Key Knowledge- The 5 vertebrate groups

Fish	Body covered in scales. Live in water. Cold-blooded. Lay eggs. Breathe through gills.	
Amphibians	Smooth skin. Live in water and on land. Cold-blooded. Lay eggs.	
Reptiles	Body covered in scales. Lay eggs. Cold-blooded. Breathe with lungs.	
Mammals	Body covered in fur or hair. Warm-blooded. Give birth to live young. Breathe through lungs.	
Birds	Body covered in feathers. Warm-blooded. Lay eggs. Breathe through lungs.	

Key knowledge—Habitat changes.

Natural changes-

Different seasons can change habitats. As the weather changes, so can the plant life of the habitat. There are different plants and animals in the environment around you at different times of the year.

Human changes-

How humans live and what they do can impact habitats in positive ways and negative ways.

Negative ways-

Deforestation-cutting down trees for a range of reasons.



Littering-dropping rubbish or leaving large objects lying in the environment.



Pollution-introducing harmful substances into the environment.

Positive ways-

Protecting endangered species via conservation projects.

Cleaning bodies of water-lakes, rivers, streams, oceans.

Recycling.





Living things and their habitats

Y4 Science NC

Key Vocabulary—

vertebrate	Animals which have a backbone/spine
invertebrate	Animals which do not have a backbone/spine.
classification	Grouping living things by looking at similarities and differences.
habitat	Where a plant or animal lives.
environment	The surroundings or conditions in which a plant or animal lives.
deforestation	The action of clearing a wide area of

Key knowledge—

All around us , there are some things that are alive, some things that are dead and some things that have never been alive.

-All living things have certain characteristics that help to keep them alive and healthy.

-Living things live in habitats that suit them and which provide for their basic needs.

—Living things depend on other living things in order to survive.

Key knowledge—

Characteristics of living things-MRS GREN

All living things do these 7 life processes.

Movement-moving, can be fast and obvious or slow and over time.

Respiration-releasing energy from food.

Sensitivity-responding to their environment.

Growth-getting bigger and older.

Reproduction-producing offspring.

Excretion-getting rid of waste.

Nutrition-taking in food.





States of Matter

Y4 Science NC

Key Vocabulary

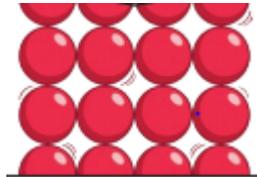
States of matter	Materials can be one of three states: solid, liquid or gas.
Solids	Having a firm shape or form that can be measured in length, width, and height.
Liquids	In a form that flows easily and is neither a solid nor a gas.
Gases	A form of matter that is neither liquid nor solid. A gas rapidly spreads out when it is warmed and contracts when it is cooled.
Melt	This is when a solid turns into a liquid.
Freeze	Liquid turns into a solid during the freezing process.
Evaporate	Turn a liquid into a gas.
Condense	Turn a gas into a liquid.
Precipitation	Liquid or solid particles that fall from a cloud as rain, sleet, hail or snow.
Water vapour	This is water that takes the form of a gas. When water is boiled it evaporates into a water vapour.



Key Knowledge

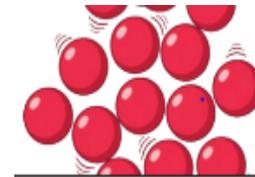
There are three states of matter: solids, liquids or gases. Some materials can change from one state to another and back again.

Solid



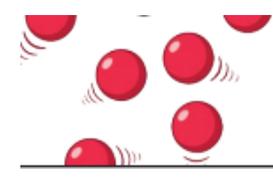
Particles in a solid are close together and cannot move. They can only vibrate.

Liquid



Particles in a liquid are close together but can move around each other easily.

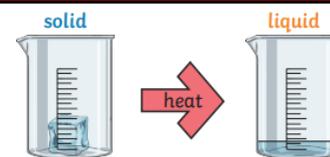
Gas



Particles in a gas are spread out and can move around very quickly in all directions.

Key Knowledge

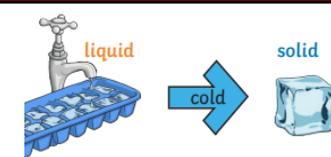
Melting



If a solid is heated to its melting point, it melts and changes to a liquid. This is because the particles start to move faster and faster until they are able to move over and around each other.

Key Knowledge

Freezing



When freezing occurs, the particles in the liquid begin to slow down as they get colder and colder. They can then only move gently on the spot, giving them a solid structure.



States of Matter

Y4 Science NC

Key Knowledge:

Evaporation occurs when water turns into water vapour. This happens very quickly when the water is hot, like in a kettle, but it can happen slowly, like a puddle evaporating in the warm air.



Key Knowledge:

Condensation is when water vapour is cooled down and turns into water. you can see this when droplets of water form on a window. The water vapour in the air cools when it touches the cold surface.

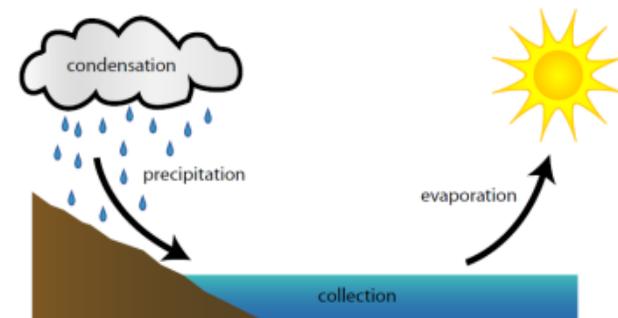


Key Knowledge:

The Water Cycle

Condensation and evaporation occur within the water cycle.

1. Water from lakes, puddles, rivers and seas is evaporated by the sun's heat, turning it into water.
2. This water vapour rises, then cools down to form water droplets in clouds (condensation).
3. When the droplets get too heavy, they fall back to the earth as rain, sleet, hail or snow (precipitation).





Sound

Y4 Science NC

Key Vocabulary

Ear	An organ used for hearing.
Particles	Solids, liquids and gases are made of particles. They are so small we are unable to see
Distance	A measurement of length between two points.
Soundproof	To prevent sound from passing.
Absorb sound	To take in sound energy. Absorbent materials have the effect of muffling sound.
Vacuum	A space where there is nothing. There are no particles in a vacuum.
Eardrum	A part of the ear which is a thin, tough layer of tissue that is stretched out like a drum skin. It separates the outer ear from the middle and inner ear. Sound waves make the eardrum vibrate.
Vibration	A movement backwards and forwards.
Pitch	How high or low the sound is.
Amplitude	The size of a vibration. A larger amplitude = a louder sound.
Volume	The loudness of a sound.
Sound wave	Vibrations travelling from a sound source.

Key Knowledge

Sound is a type of energy. Sounds are created by vibrations.

The louder the sound, the bigger the vibration.

Pitch is a measure of how high or low a sound is.

A whistle being blown creates a high-pitched sound.

A rumble of thunder is an example of a low-pitched sound.



Faster vibrations = higher pitch



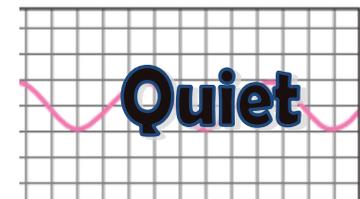
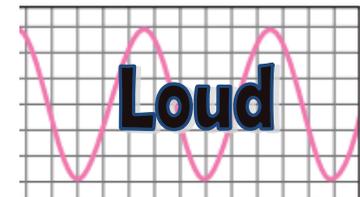
Slower vibrations = lower pitch



Key Knowledge

The size of the vibration is called the amplitude.

Louder sounds have a larger amplitude, and quieter sounds have a smaller amplitude.





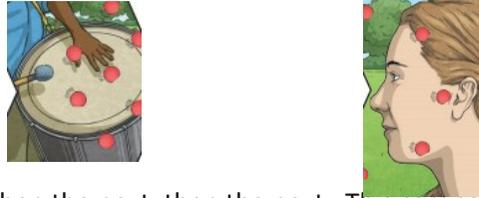
Sound

Y4 Science NC

Key Knowledge

Sound can travel through solids, liquids and gases. Sound travels as a wave, vibrating the particles in the medium it is travelling in. Sound cannot travel through a vacuum.

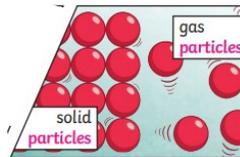
When you hit the drum, the drum skin vibrates. This makes the air particles closest to the drum start to vibrate as well.



The vibrations then pass to the next air particle, then the next, then the next. This carries on until the air particles closest to your ear vibrate. Passing the vibrations into your ear.

Key Knowledge:

Sound energy can travel from particle to particle far easier in a solid because the vibrating particles are closer together than in other states of matter.



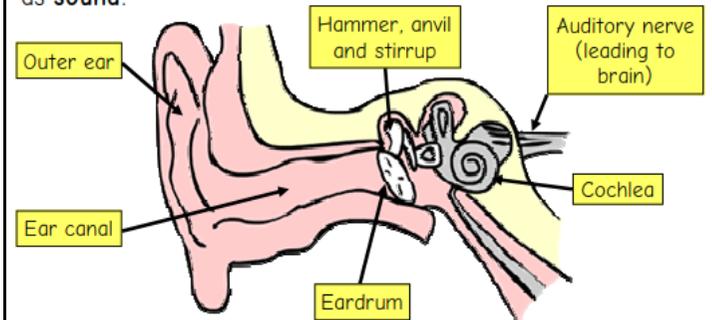
If you throw a stone in a pond, it will produce ripples. As the ripples spread out across the pond, they become smaller. When sound vibrations spread out over a distance, the sound becomes quieter just like ripples in a pond.



Key Knowledge:

How the ear works

When a sound wave reaches our ear, our outer ear (the part that we can see on the side of our heads) funnels the sound into our heads down the ear canal. At the end of the ear canal is the eardrum, which is waterproof and airtight. Past the ear canal is the middle ear. Inside the middle ear are the hammer, anvil and stirrup (the three smallest bones in the body) which vibrate and pass sound waves to the inner ear, which contains the cochlea, which turns the vibrations into electrical signals. These signals travel down to auditory nerve to the brain, which uses sound.





Forces

Y5 Science NC

Key Vocabulary

Force	Pushes or pulls.
Gravity	A pulling force exerted by the Earth (or anything else which has mass).
Earth's Gravitational Pull	The pull that Earth exerts on an object, pulling towards Earth's centre. It is the Earth's gravitational pull which keeps us on the ground.
Weight	The measure of the force of gravity on an object.
Mass	A measure of how much matter (or 'stuff') is inside an object.
Friction	A force that acts between two surfaces or objects that are moving, or trying to move,
Air Resistance	A type of friction caused by air pushing against any moving object.
Water Resistance	A type of friction caused by water pushing against any moving object.
Buoyancy	An upward force that a liquid applies to objects.
Streamlined	When an object is shaped to minimise the effects of air or water resistance.
Mechanism	Parts which work together

Key Knowledge

Forces can make an object....

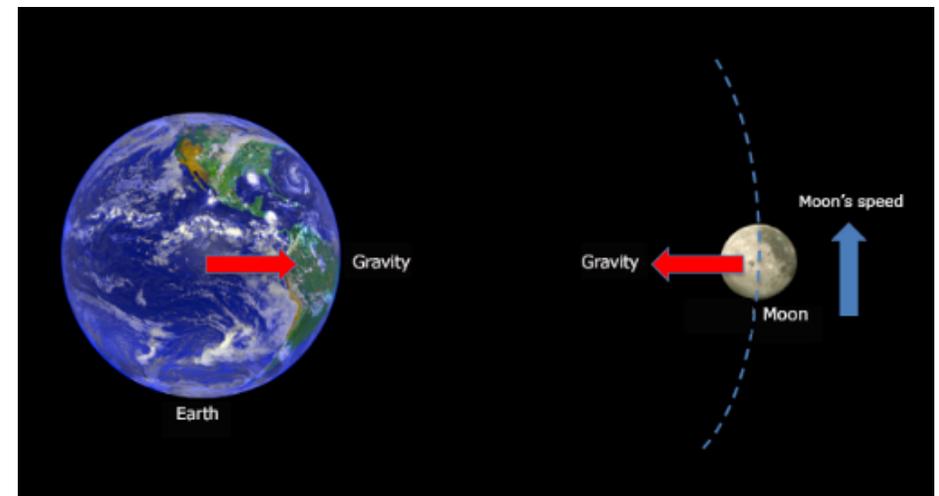
- ⇒ start to move.
- ⇒ stop moving.
- ⇒ change direction.
- ⇒ change its shape.
- ⇒ move more slowly.
- ⇒ move faster.
- ⇒ stop moving.

Key Knowledge

Isaac Newton is famously thought to have developed his theory of gravity when he saw an apple fall to the ground from an apple tree.

Mass is how much matter is inside an object. It is measured in kilograms (kg).

Weight is how strongly gravity is pulling an object down. It is measured in newtons (N).





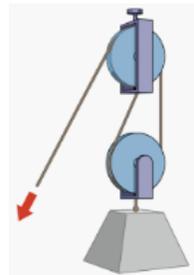
Forces

Y5 Science NC

Key Knowledge

The Moon has a smaller mass than Earth so the gravitational pull on the Moon is smaller than it is on Earth.

Jupiter has a greater mass than Earth so the gravitational pull on Jupiter is stronger than Earth.



Key Knowledge:

Pulleys can be used to make a small force lift a lighter load.

The more wheels in a pulley, the less force is needed to lift a weight.



Gears and cogs can be used to change the speed, force or direction of a motion. When two gears are connected, they

turn in the opposite direction.



Lever can be used to make a small force lift a lighter load. A lever always rests on a pivot.



Key Knowledge:

Water resistance is a type of friction which can slow things down in the water. Water acts upon the objects making them harder to pass through. A fish has a streamlined body shape that helps it swim through water more easily.



Air resistance is a type of friction which acts against gravity on falling or moving objects. It's what you feel on your hair when riding fast on a bike or it's what fills a parachute to help slow you down when falling from the sky. Objects such as aeroplanes reduce air resistance because of their streamlined shape.





Properties and Changes of Materials

Y5 Science NC

Key Vocabulary

Materials	The substance that something is made from e.g. wood, plastic, metal.
Solids	Having a firm shape or form that can be measured in length, width, and height.
Liquids	In a form that flows easily and is neither a solid nor a gas.
Gases	A form of matter that is neither liquid nor solid. A gas rapidly spreads out when it is warmed and contracts when it is cooled.
Melting	The process of heating a solid until it turns into a liquid.
Freezing	When a liquid cools and turns into a solid.
Evaporating	When a liquid turns into a gas or vapour.
Condensing	When a gas, such as water vapour, cools and turns into a liquid.
Conductor	A material that heat or electricity can easily travel through.
Insulator	A material that does not let heat or electricity travel through them.
Transparency	A transparent object lets light through so the object can be looked through.

Key Knowledge

Different objects are used for particular jobs based on their properties: electrical conductivity, flexibility, hardness, insulators, magnetism, solubility, thermal conductivity, transparency.

For example, when glass is used for windows it is because it is hard and transparent. Oven gloves are made from a thermal insulator to keep the heat from burning your hand.

Solids are one of the three states of matter and, unlike liquids or gases, they have a definite shape that is not easy to change. Different solids have particular properties such as **stretch**, **strength**, or **hardness** that make them useful for different jobs. Most solids are made up of tiny crystals.

Liquids flow and do not have a fixed shape. Instead, they take on the shape of whatever container they are in. If you pour a liquid from a glass onto a plate, the volume of liquid (the space it takes up) stays the same, but its shape changes.

Gases are all around us, but although many, such as perfume, can be smelt, most gases are **invisible**. Like liquids, gases can flow but, unlike solids or liquids, gases will not stay where they are put. They have no set shape or volume, and they expand in every direction to fill completely whatever container they are put into. If the container has no lid, the gas escapes.



Properties and Changes of Materials

Y5 Science NC



Key Knowledge

Dissolving

A solution is made when solid particles are mixed with liquid particles. Materials that will dissolve are known as soluble. A suspension is when the particles won't dissolve.

Sugar is a soluble material.



Sand is an insoluble material.



Key Knowledge:

Conductors

Some materials are particularly well-suited to a certain job. For example, certain kinds of metal, such as copper or aluminium, are extremely efficient conductors of electricity (this means electricity passes well through them). Therefore, these are the metals most likely to be used for electrical cables. Because plastic and rubber do not conduct electricity, they are used to wrap the cables of electrical items we use around the house.

Materials that allow heat to pass through them easily are called thermal conductors. Metals, such as aluminium, copper, steel, and iron, are all good thermal conductors. Thermal conductors can be useful when it is necessary to cool things down, or heat them up, quickly.

Key Knowledge

Some materials can be changed, these can be reversible or irreversible changes.

Reversible changes, such as mixing and dissolving solids and liquids together, can be reversed by:

Sieving:

Smaller materials are able to fall through the holes in the sieve, separating them from larger particles.



Filtering:

The solid particles will get caught in the filter paper but the liquid will be able to get through.



Evaporating:

The liquid changes into a gas, leaving the solid particles behind.



Irreversible changes often result in a new product being made from the old materials. For example, burning wood produced ash. When a cake mixture is baked.



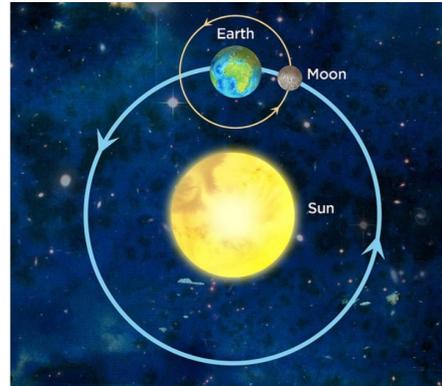


Earth and Space

Yr5 Science NC

Key Vocabulary—Earth and Space

Orbit	the curved path of a celestial object or spacecraft round a star, planet, or moon. To move around.
Celestial body	any natural body outside of the Earth's atmosphere
Star	A star is an astronomical object consisting of a luminous spheroid of plasma held together by its own gravity. The nearest star to Earth is the Sun
Sundial	A sundial is a device that tells the time of day when there is sunlight by the apparent position of the Sun in the sky.
Terrestrial planet	A planet made mostly of rocks and metals
Moon	An object which directly orbits a planet
Gas Giant	A giant planet made mostly of hydrogen and helium
Ice Giant	A giant planet made mostly of heavier materials than hydrogen and helium, but not rocks and metals
Sphere/spherical	A sphere is a geometrical object in three-dimensional space that is the surface of a ball.
Axis	an imaginary line about which a body rotates
Rotation/rotate	move or cause to move in a circle round an axis or centre.
Solar System	A solar system refers to a star and all the objects that orbit it. Our Solar System consists of the Sun eight planets and their natural satellites (such as our moon), dwarf planets, asteroids and comets. It is located in an outward spiral arm of the Milky Way galaxy.



Key Vocabulary—Working Scientifically

Observation	Closely watching and monitoring
Prediction	say or estimate that (a specified thing) will happen in the future or will be a consequence
Variable	not consistent or having a fixed pattern; something might change
Comparative	measured or judged by estimating the similarity or dissimilarity between one thing and another
Accuracy	the quality or state of being correct or precise
Precision	the quality, condition, or fact of being exact and accurate
Data	facts and statistics collected together for reference or analysis
Fair tests	A fair test is a test which controls all but one variable when attempting to answer a scientific question. Only changing one variable allows the person conducting the test to know that no other variable has affected the results
Conclusion	a judgement or decision reached by reasoning.
Evidence	the available body of facts or information indicating whether a belief or proposition is true
Classify	arrange (a group of people or things) in classes or categories according to shared qualities or



Earth and Space

Y5 Science NC

Key Knowledge:

The Sun is a star at the centre of our solar system and it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a "dwarf planet" in 2006).

Our solar system is made up of a star, the Sun, and countless different bodies which move around it. These bodies include planets, moons, asteroids, lumps of ice, rocks and dust.

Our Solar System formed about 4.6 billion years ago from a large cloud of gas and dust called a nebula.

A day + a night = 24 hours

365 of these makes 1 year.

The Earth takes 1 year to orbit the Sun.

The Earth is a sphere. The Sun cannot shine on both sides of the Earth at the same time. Some of the Earth is bright—day. Some is dark—night. The Earth spins so each part has day and night.

The Earth also spins on its own axis. As the Earth spins the position of the Sun varies. In the morning the sun appears to rise, throughout the day it gets higher in the sky until midday. Then the sun appears to sink and set.

The Earth is tipped as it spins. Light and heat reach the Earth at different angles in summer and winter. In winter the Sun stays low in the sky. In summer the Sun rises higher in the sky. In winter the light and heat from the Sun is more spread out than during the summer. It feels colder.

Even though the Earth is about 150 million kilometres away from the Sun, we still feel the energy from the explosions that happen within it.

Key Knowledge

A moon is a celestial body that orbits a planet and accompanies the planet on its own orbit around the Sun (Earth has one moon; Jupiter has four large moons and numerous smaller ones)

The Moon is not a source of light. Light from the Sun shines on the Moon. Some light is scattered so we see it on Earth.

The Moon takes about 28 days to move round the Earth. It always shows Earth the same side. The shape we see changes during the 28 days—a lunar month.

The moon is smaller than the Sun, but the Sun is a lot further away than the Moon so they appear to look the same size in the sky.

The Moon reflects light from the Sun.

The planets can be placed into two distinct groups. The four planets closest to the Sun are small and rocky and are often referred to as the inner, or terrestrial, planets. The outer four planets are much larger and very cold. These are the giant planets. Jupiter and Saturn are known as the gas giants. Uranus and Neptune are referred to as the ice giants.

It is not safe to look directly at the Sun, even when wearing dark glasses.

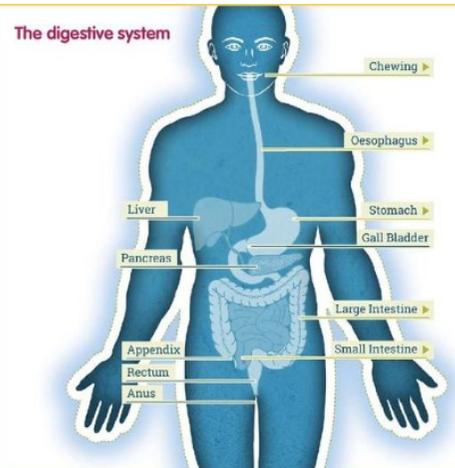
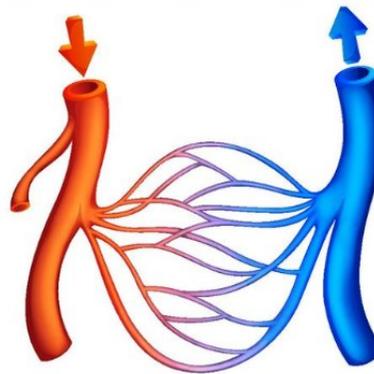
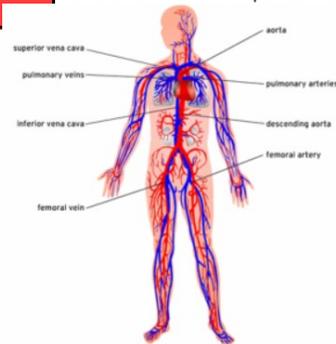


Animals including humans

Y5 & Y6 Science NC

Key Vocabulary - Year 5

Ageing	Ageing is the process of becoming older. The term refers especially to human beings, many
Old age	Old age refers to ages nearing or surpassing the life expectancy of human beings, and is
Elderly	old or ageing .
Adult	having attained full size and strength; grown up; mature: an adult person, animal, or plant.
Causal relationships	A causal relation between two events exists if the occurrence of the first causes the other. The first event is called the cause and the second event is called the effect.
Growth	the process of increasing in size . Something is growing in size.
Change	make or become different.
Death	the action or fact of dying or being killed; the end of the life of a person or organism.



Key Vocabulary—Year 6

Villi	Structures in the small intestine which help absorb nutrients
Nutrients	Substances that animals need to stay alive and healthy.
Kidneys	Organs which filter blood and make urine from waste and excess water.
Liver	An organ which processes waste from the blood and produces bile.
Drug	A substance containing natural or man-made chemicals that has an effect on your body when it enters your sys-
Alcohol	A drug produced from grains, fruits or vegetables when they are put through a process called fermentation.
Circulatory System	A system which includes the heart, veins, arteries and blood transporting substances around the body.
Heart	An organ which constantly pumps blood around the circulatory system.
Pulmonary	Relating to the lungs.
Alveoli	Tiny air sacs in the lungs where gas exchange takes place.
Gas exchange	The process by which oxygen enters the bloodstream from the lungs and the lungs receive carbon dioxide from the blood to breathe out. This process happens in the alveoli and the capillaries around the alveoli.
Arteries	Arteries carry oxygenated blood away from the heart.
Veins	Veins carry de-oxygenated blood toward the heart.
Capillaries	Capillaries are the smallest blood vessels in the body and it is here that the exchange of water, nutrients, oxygen



Animals including humans

Y5 & Y6 Science NC

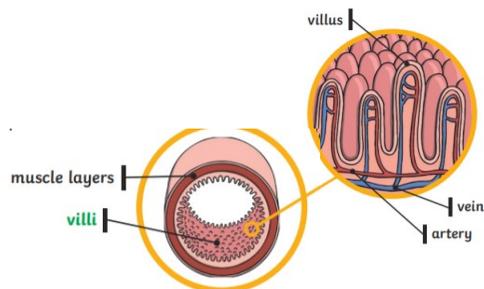
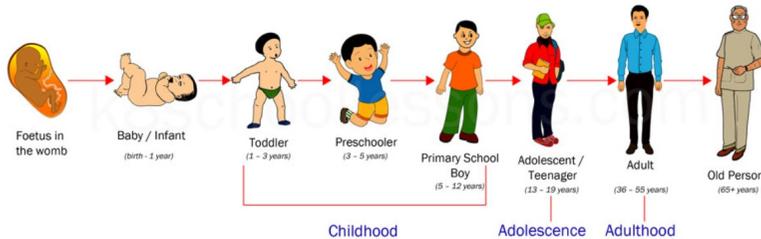
Key Knowledge - Year 5

Humans stop growing around the age of 20 years and spend most of their adult lives gradually aging.

Generally women start having babies in their 20s, 30s and 40s – this is because fertility starts to deteriorate and the risks to mother and baby increase as a woman ages.

Men can reproduce at any adult age while women reach a point, usually in their 50s, when they go through what is called menopause, during which time they stop menstruating and can no longer reproduce.

As humans age bones weaken, bodies shrink slightly in height, hair loss (more often in men) and hair loses its colour, there is often deterioration in hearing and eyesight, the heart rate slows down, and an end to fertility and skin become wrinkled (less elastic).



Key Knowledge—Year 6

Where one bone meets another we have a joint; these are essential for movement. Where there are joints, muscles control movement. However muscles can only pull on a bone, they can't push it. They can only apply a force in one direction.

Some parts of the skeleton, such as the skull, rib cage and pelvis provide protection and the spinal cord also protects some important nerves.

Blood is made up of different components. Some of the main components of blood are red blood cells, white blood cells and plasma.

Red blood cells carry oxygen, which is needed by every cell in the body. They absorb oxygen in the lungs and release it as they pass through the body. Red blood cells contain a chemical called haemoglobin which gives blood its deep red colour.

White blood cells are part of the body's immune system. They attack and destroy any foreign material which could threaten us, such as infectious viruses and bacteria. The circulatory system allows white blood cells to travel wherever they are needed in the body.

Platelets are broken pieces of cells with an important function. They prevent or stop bleeding by causing blood to clot, or form into a gel, at the site of a wound. The circulatory system allows platelets to travel wherever they are needed.

Blood plasma is the liquid which contains all the other components of blood. It is mostly composed of water and is pale yellow in colour. Plasma absorbs the waste products from cells, especially carbon dioxide, which then leaves the body through the lungs.

Regular exercise strengthens muscles including the heart; improves circulation; increases the amount of oxygen around the body; releases brain chemicals which help you feel calm and relaxed; helps you sleep more easily; and strengthens bones.

A healthy diet involves eating the right types of nutrients in the right amounts. Nutrients pass through the villi and are absorbed into the blood vessels. Water is absorbed in the small intestine in exactly the same way as other nutrients are absorbed.



Living things and their habitats.

YR5 & YR6 Science NC

Key Vocabulary - Year 5 short—Life cycles

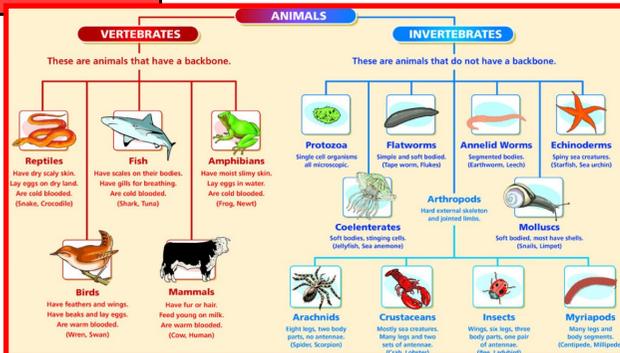
Fertilise	The action of fusing the male and female sex cells in order to develop an egg.
Life cycle	The journey of changes that take place throughout the life of a living thing including
Pollination	The transfer of pollen to a stigma to allow fertilisation.
Reproduction	The process of new living things being made.
Gestation	The length of pregnancy
Sexual reproduction	Two parents are needed to make offspring which are similar but not identical to either
Asexual reproduction	One parent is needed to create an offspring, which is an exact copy of the parent.
Metamorphosis	An abrupt and obvious change in the structure of an animal's body and their behaviour.



v

Key Vocabulary—Year 6—Classification

algae	A single or multi-cellular organism that has no
bacteria	Tiny little organisms that are everywhere around
classification	The arrangement of organisms into orderly groups based on their similarities and presumed evolutionary relationships.
fungi	A classification or group of living organisms. This
invertebrate	An invertebrate animal does not have a backbone and 97% of creatures belong to this group.
micro-organism	An organism which is microscopic, making it too small to be seen by the human eye.
organism	An individual animal, plant or single-celled life form.
species	A group of closely related organisms that are very similar to each other and are usually capable of producing offspring.
taxonomy	The science of naming, identifying and classifying
vertebrate	A vertebrate animal is one that has a backbone.
virus	A small infectious agent that replicates only inside the living cells of an organism.





Living things and their habitats.

YR5 & YR6 Science NC

Key Knowledge - Life cycles and reproduction

Humans develop inside their mothers and are dependent on their parents for many years until they are old enough to look after themselves.

Amphibians such as frogs are laid in eggs then, once hatched, go through many changes until they become an adult.

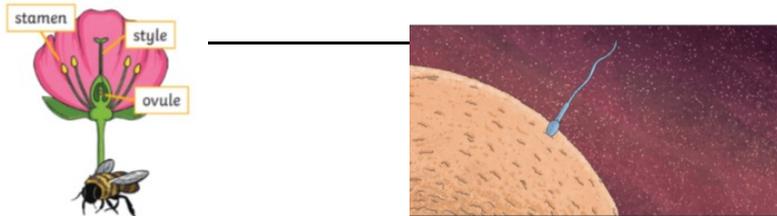
Some animals such as butterflies, go through metamorphosis to become an adult.

Birds are hatched from eggs and are looked after by their parents

Some living things, such as plants, contain both the male and female sex cells. In others, such as humans, they contain either male or female sex cells.

Reproduction in plants—Most plants contain the male sex cell (pollen) and female sex cell (ovules) but most plants can't fertilise themselves. Wind and insects help to transfer pollen to a different plant. The pollen from the stamen of one plant is transferred to the stigma of another. The pollen then travels down a tube through the style and fuses with an ovule.

Reproduction in mammals—Mammals use sexual reproduction to produce their offspring. The male sex cell, called the sperm, fertilises the female sex cells. The fertilised cell divides into different cells and



Key Knowledge—classification

Microorganisms are very tiny living things. They are so small that they are not visible to the naked eye, so a microscope is needed to see them. Microorganisms can be found all around us. They can live on and in our bodies, in the air, in water and on the objects around us. They can be found in almost every habitat on Earth.

Bacteria are simple unicellular organisms.

Archaea are simple unicellular organisms that often live in extreme environments.

Protists are unicellular and are more complex than bacteria or archaea.

Fungi are unicellular or multicellular and absorb food.

Plants (plantae) are multicellular and make their own food.

Animals (Animalia) are multicellular and take in their food. Animalia can be further grouped into: fish, reptiles, mammals, amphibians and birds.

The 7 characteristics of living things are: movement, respiration, sensitivity, growth, reproduction, excretion, nutrition.

Vertebrates have a backbone, e.g. mammals, birds and fish. Invertebrates do not have a backbone, e.g. molluscs, insects and crustaceans

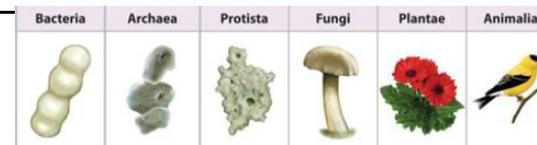
Mammals are warm blooded, breathe air, give birth to live young and their young feed from their mother's milk.

Birds are warm blooded, vertebrates, lay eggs, have feathers and wings and usually fly .

Reptiles are vertebrates, cold-blooded, lay eggs and have scales or hard parts.

Fish are vertebrates, gill-bearings, aquatic and mostly cold-blooded.

Amphibians live on land or water, are cold blooded and lay eggs.



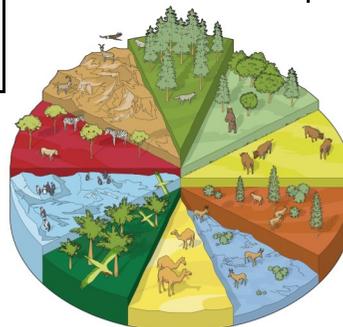


Evolution and Inheritance

Y6 Science NC

Key Vocabulary

offspring	The young animal or plant that is produced by the reproduction of that species.
inheritance	This is when characteristics are passed on to offspring from their parents.
variations	The difference between individuals within a species.
characteristics	The distinguishing features or qualities that are specific to a species.
adaptation	An adaptation is a characteristic (or a trait) changing to increase a living things chance of surviving and reproducing.
habitat	Refers to a specific area or place in which particular animals and plants can live.
environment	An environment contains many habitats and includes areas where they arte both living and non-living.



Key Knowledge

Animals and plants produce **offspring** that are similar but not identical to them. **Offspring** often look like their parents because features are passed on.

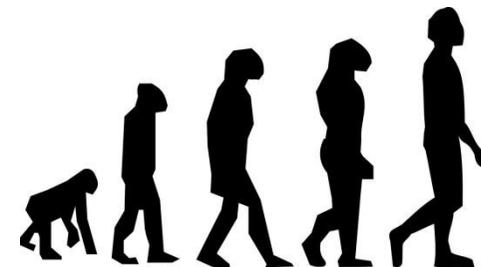
In the same way that there is **variation** between parents and their **offspring**, you can see **variation** within any species even plants.

Adaptive traits are characteristics that are influenced by the **environment** the living things live in. These **adaptations** can develop as a result of many things such as food and climate.

A good **habitat** should provide shelter, water, enough space and plenty of food.

Eye colour is an example of an inherited trait, but so are things like hair colour, the shape of your earlobes and whether or not you can smell certain flowers.

There are many types of **environment** around the world. Polar regions, deserts, rainforests, oceans, rivers and grassland are all environments.





Light

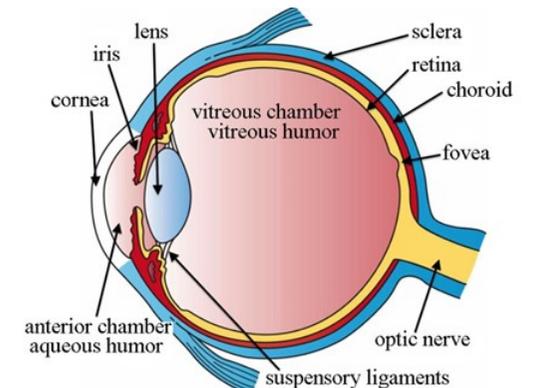
Y6 Science NC

Key Vocabulary

Light wave	One of the characteristics of light is that it behaves like a wave. Light can be defined by its wavelength and frequency. The frequency is how fast the wave vibrates up and down.
Light source	A form of energy that travels in waves, like sound. You can find different sources of light, such as a candle or the Sun.
Concave	It is a lens that curves inwards and reflects light differently as a result.
Convex	It is a lens that curves outwards and reflects
Filter	A filter is a transparent material that absorbs some colours and allows others to pass through.
lens	A lens is a curved piece of glass or plastic designed to refract light in a specific way.
retina	The retina is at the back of your eye and it has light-sensitive cells called rods and cones.
cornea	The cornea is thin, clear and covers your eye. It's important because it helps you see by focusing light as it enters the eye.
pupil	The pupil can be compared with the shutter of a camera. It is surrounded by the iris which is the coloured part of the eye.
iris	By opening and closing the pupil, the iris can control the amount of light that enters the eye.

Key Knowledge

Space does not have any light. We can see things in space due to light bouncing off of the objects in space.
Light doesn't travel as fast when it has to pass through mediums that are different, such as air, water or glass.
Light that we see from the sun actually left the sun ten minutes before we see it.
Light will travel in a completely straight line until it hits an object that will bend it. The light that is in a straight line are called 'light waves'.
Light can be controlled and produced in so many ways. A camera can control the amount of light that comes into the camera lens. We also use light in televisions, medical systems, copy machines, telescopes and satellites.
Light is used by plants to convert the light into energy as their 'food'. The process is called 'photosynthesis' and converts carbon dioxide through the energy of the light.





Electricity

Y6 Science NC

Key Vocabulary

conductor	Some materials let electricity pass through them easily. These materials are known as electrical conductors.
insulator	Plastic, wood, glass and rubber are good electrical insulators.
socket	A socket is a safe device to plug your electrical items into at home. Almost every room at home will have at least one socket.
Series circuit	A series circuit is one that has more than one resistor, but only one path through which the electricity (electrons) flows.
cells	An electrical cell is a device that is used to generate electricity, or one that is used to make chemical reactions possible by applying electricity.
volts	Voltage is an electrical potential difference, the difference in electric potential between two places.
generator	A machine that converts energy into electricity.
turbine	A machine that creates continuous power in which a wheel, or something similar, moves round and round by fast moving water, steam, gas or air.
fuses	A fuse is a strip of wire that melts and breaks an electric circuit if it goes over a safe level.
Thomas Edison	He was a great inventor that came up with a way of making the electric light bulb accessible for homes, industry and outside in the streets.



Key Knowledge

Electricity travels at the speed of light. That's more than 186,000 miles per second!
Coal is the biggest source of energy for producing electricity. Coal is burned in furnaces that boils water and creates steam.
Electricity is a type of energy that build up in one place (static), or flow from one place to another (current electricity).
Electricity comes from the power station, the wind, the sun, water and even an animal's poo!
A popular way of generating electricity is through hydropower. This is a process where electricity is made by water which spins turbines attached to generators.
A bolt of lightning can measure up to 3,000,000 volts, and it lasts less than one second!
Electric fields work in a similar way to gravity. Whereas gravity always attracts, electric fields can either attract or repulse.



Component	Symbol	Purpose
Cell (Battery)		Provides electrical energy
Power supply		Alternative to using cells
Wire		Allows current to travel
Bulb/light		Converts electrical energy into heat and light
Motor		Converts electrical energy into movement energy
Buzzer		Converts electrical energy into sound energy
Switch		Allows circuit to be opened or closed