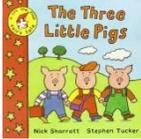
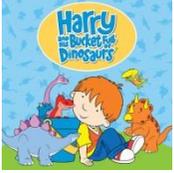
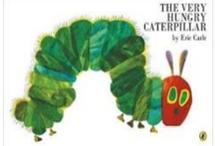


Science Knowledge Overview 2019-2020

	Autumn	Spring	Summer
EYFS	<p style="text-align: center;"><u>All about me</u></p> <p>The main parts of the human body are the legs, the torso, the arms and the head. There are 206 bones in the human body. <u>Storybook link – Funny Bones by Allan and Janet Ahlberg</u></p>  <p>There are many different materials in the environment around us such as wood, clothes, bricks and plastic. Words such as texture, bumpy and smooth can be used to describe properties of materials. <u>Storybook link – The Three Little Pigs</u></p>  <p style="text-align: center;"><u>Light and Dark</u></p> <p>When the sun is out, it is called day. After the sun sets, it is called night.</p> <p>There are 4 seasons: spring, summer, autumn and winter. It is cold during winter and it warms up as we go through spring into summer. It then cools down again. <u>Storybook link – Pumpkin Soup by Helen Cooper</u></p>  <p><i>We're Going on a Bear Hunt</i> Michael Rosen Helen Oxenbury</p>  <p>Different bears have different habitats. Bears adapt for their different habitats, for example some go into a deep sleep in the colder months. <u>Storybook link – We're Going on a Bear Hunt by Michael Rosen</u></p>	<p style="text-align: center;"><u>Out of this world</u></p> <p>There are 8 planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Neil Armstrong and Buzz Aldrin were the first two people to step foot on the moon. Astronauts need special equipment for travelling to space (for example space suits).</p>  <p>There are many different plants in the world around us. Plants need good levels of sunlight, water and warmth to be healthy. A bean plant grows from a seed, through germination, then produces leaves and finally flowers to produce more seeds. <u>Storybook link – Jack and the Beanstalk</u></p>  <p>A chicken starts as an egg. It then becomes a hatchling, grows into a chick before finally becoming a chicken. Chicks need warmth, humidity and ventilation to hatch. Once they hatch they need warmth, ventilation, food and water until they can fend for themselves.</p> 	<p style="text-align: center;"><u>All creatures great and small</u></p> <p><u>Core knowledge</u> Palaeontologists are people that study dinosaurs. Many different dinosaurs used to live on the planet. A large asteroid hit Earth 66 million years ago and caused the mass dinosaur extinction. <u>Storybook link – Harry and His Bucketful of Dinosaurs by Ian Whybrow and Adrian Reynolds</u></p>  <p>The planet can be looked after by recycling. Some materials that we can recycle are paper, certain plastics, cardboard and metal cans. Some materials are called insulators so they keep heat in. Some insulating materials are cork, foam and wool. Materials can float or sink, for example a rubber duck floats.</p>  <p>Butterflies begin as eggs. They then become caterpillars. The next stage is a chrysalis before they then become a butterfly. We will hatch butterflies. <u>Storybook link – The Very Hungry Caterpillar by Eric Carle</u></p>  <p>We get lots of food from farms, for example milk and meat. Healthy foods include fruit and vegetables. Exercise can keep us healthy. Exercise has different effects on the body, such as getting hot, breathing heavier and making our hearts beat faster.</p>

Year
1

Animals

Core knowledge

Scientists group animals according to their features. Animals can also be grouped based on what they eat: carnivores, herbivores and omnivores. Animals need food, water and shelter.

They get food from plants and other living things. Different animal groups have different requirements for their environment in order to survive. Most babies need to be fed and cared for by their parents. Pets need caring for by their owners. Not all animals are suitable to keep as pets.



Human Bodies and Senses

Core knowledge

Humans have five senses related to different body parts. Taking care of your body includes maintaining a balanced diet and exercising regularly. Different parts of the eye have different purposes. Sounds can be very different and they travel through our ears to our brain. Some people's senses do not work properly, and sometimes they can use things to help them. Senses can warn you of danger.



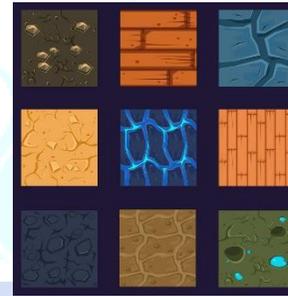
Working Scientifically (throughout the term)

Ask their own questions about what they notice.
Identify and classify.
Use the appropriate scientific language to communicate their ideas.
Notice and explain differences.
Use simple equipment.

Materials

Core knowledge

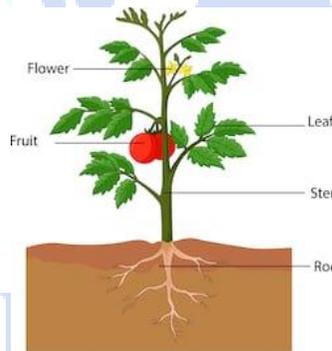
There are many materials that are widely used in our environment: wood, plastic, rock, metal. Different materials are suitable for different purposes, for example wool is often used for clothing. Some materials are natural (cotton), and some are man-made (nylon). Materials can be grouped based on their properties, for example their texture.



Plants

Core knowledge

Plants need warmth, light and water to grow. Plants have seeds, roots, stems and leaves. Some plants have branches and trunks. Deciduous trees lose their leaves during autumn and grow new leaves during spring.



Evergreen trees don't lose their leaves. Plants make their own food.

We eat some types of plants. For example: root – carrots; leaves – lettuce; and seeds – peas. Plants spread their seeds in different ways to reproduce.

Working scientifically (throughout the term)

Identify and classify objects.
Explain differences between objects using their properties.
Ask their own questions about what they notice.

Seasons

There are four seasons: spring, summer, autumn and winter. We need the sun for light and warmth. The weather can change throughout the day. Colder weather comes in autumn and winter. Warmer weather comes in spring and summer. Scientists study the weather to make forecasts. Some weather can be very dangerous, such as floods and hurricanes. There are lots of pieces of scientific equipment that can be used to measure things such as temperature and rainfall.



Working scientifically (throughout the term)

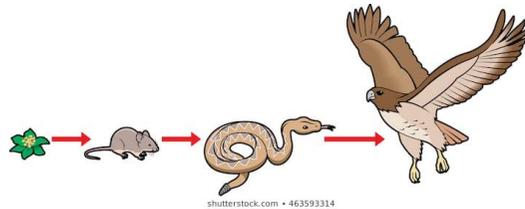
Observations over time.
Ask simple questions.
Identify and classify magnetic materials.
Perform simple tests.
Recording temperatures
Creating weather charts.

Year
2

Living Things and their Environments

Core knowledge

Different animals live in their own specific habitats.
Animals can adapt to survive in their habitat.
Animals don't make their own food. They can be herbivores, carnivores or omnivores.
Plants need nutrients from the soil, water, sun-light and air.
Animals and plants form the food chain.
Energy passes up a food chain.
There is a large diversity of ocean life and many species may not have been discovered yet.
There are many dangers to the ocean.
Environments are changing because of increases in population and this can be a danger to habitats.
To protect the environment, we can reduce, reuse and recycle.



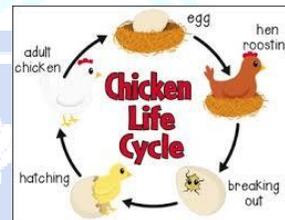
Working Scientifically (throughout the term)

Ask their own questions about what they notice.
Use appropriate scientific vocabulary to communicate their ideas.
Notice and explain changes and differences.
Identify and classify.
Use secondary sources of information to find things out.

Animals, including humans

Core knowledge

Animals have offspring.
Human's offspring start as babies and grow into adults.
Animals have basic needs that must be met in order to survive.
To keep healthy, humans should exercise regularly, eat a balanced diet and maintain a healthy lifestyle. This will also prevent illnesses.



Plants

Core knowledge

Seeds and bulbs grow into mature plants.
Plants start as seeds and then they germinate before they grow into the plants we can see.
In order to survive, plants need water, light and a suitable temperature.
Different plants need different living conditions.



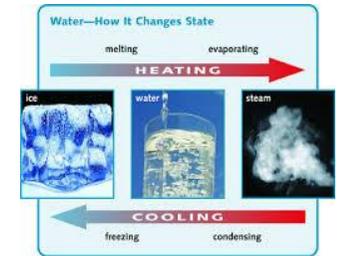
Working scientifically (throughout the term)

Use simple equipment.
Gather and record data, including taking measurements.
Use observations and ideas to suggest answers to questions they have.

Materials

Core knowledge

Different materials are suitable for particular uses.
Objects can be classified according to the material they are made from, and their physical properties.
Some materials can change shape by bending, squashing, twisting and stretching.
Some materials can change state, for example from a solid to a liquid (melting ice) and vice versa.
Some materials can be magnetic – that means they are attracted to a magnet.



Working scientifically (throughout the term)

Identify and classify materials based on their properties.
Ask simple questions when conducting experiments.
Perform simple tests using equipment.
Gather and record data, including taking measurements.
Use the data collected to answer simple questions.

Year
3

Light, Earth & Space

Core knowledge

There are eight planets in the solar system that all orbit the sun.

The Earth's orbit of the sun takes a year (365 days).

The Sun does not move.

The Sun is a star and it is a source of light and heat.

The Moon orbits the Earth.

The Sun, all planets and most moons are roughly spherical.

The Earth spins once every 24 hours – we call this a day.

When the Earth is facing away from the Sun, it would be night time in that region.

Light enters our eyes (in straight lines) through the pupil. This is how we see.

Darkness is simply the absence of light.

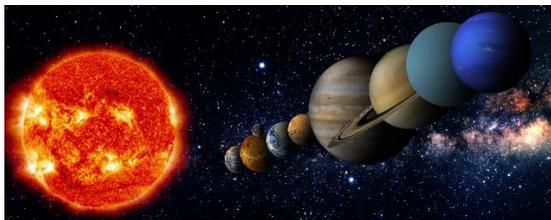
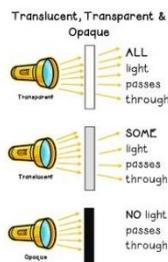
Light always travels in straight lines.

Light from the Sun can be both beneficial and dangerous. Objects either allow light to pass through them, partially allow light to pass through them, or do not allow any light to pass through them.

Some objects produce their own light.

Some objects reflect light.

Shadows are the result of opaque objects blocking the light.



Working scientifically (throughout the term)

Setting up simple practical enquiries, comparative and fair tests.

Asking relevant questions and using different types of scientific enquiries to answer them.

Notice patterns from experiments in the way that the size of shadows can change.

Irreversible Changes

Core knowledge

Chemical reactions always create new substances.

Chemical reactions cause temperature increases, decreases or no change.

A colour change is a sign a chemical reaction has taken place.

Light is a sign that a chemical reaction is taking place.

The colour of a glow in a chemical reaction can change depending on the reactants.

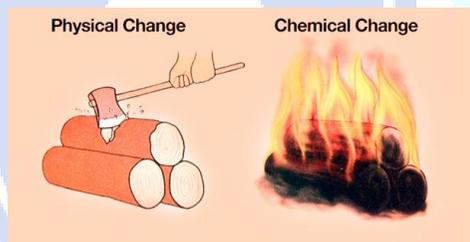
Mass stays the same in a chemical reaction.

Electricity can start a chemical reaction.

Most chemical reactions are irreversible, but not all of them.

In a reversible reaction, new substances are created which then break down back to the original reactants.

Solutions are made by dissolving one substance in another.



Working scientifically (throughout the term)

Setting up simple practical enquiries, comparative and fair tests.

Identify variables.

Record data and results of increasing difficulty using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

Report and present findings both orally and written, from enquiries, including conclusions and causal relationships.

Also comment on explanations of and degree of trust in the result of the enquiries.

Gather, record, classify and present data in a variety of ways.

Living Things, Habitats & Lifecycles

Organisms are grouped based on common characteristics.

Micro-organisms cannot be seen with the naked eye.

Bacteria and viruses are two of the classes of micro-organisms.

Animals are either hatched or born.

Different animals have different life cycles.

Animals need food, water, shelter, and warmth to thrive.

There are approximately 9 million species of animals around the world that occupy all continents and types of habitats.

Animals are adapted to their habitats and the plants and animals around them.

Humans go through several stages of development from baby to old age.

There are mental and physical changes during these stages of

development.

Plant seeds are spread in a range of ways.

Seeds germinate to produce young plants.

There are 40,000 species of plant and they grow in all habitats.

90% of all species of plants are flowering.

Local habitats vary and many local species have adapted to live in urban areas.

Great Britain is green because there tends to be a lot of rainfall each year.

Humans have had a huge impact on the natural world.

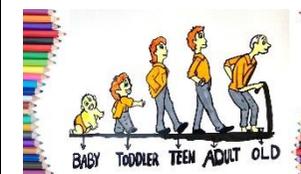
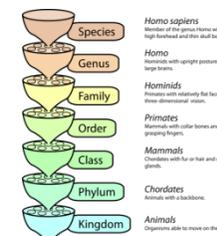
There have been both positive and negative impacts (mainly negative).

Working scientifically (throughout the term)

Use scientific evidence to answer questions and support findings.

Notice patterns in data.

Identify differences, similarities or changes relating to scientific ideas and processes.



Year
4

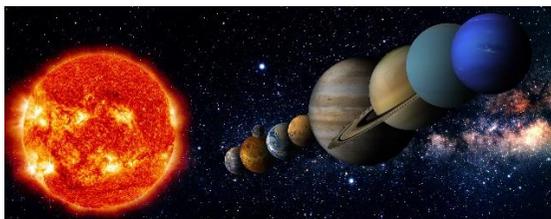
Light, Earth & Space

Core knowledge

There are eight planets in the solar system.
The planets orbit the sun and moons orbit their planet.
The Sun is a star and it is fixed in its position in space.
All planets and most moons are roughly spherical.
The Earth spins on its axis once every 24 hours.
When the Earth is facing away from the Sun, it would be night time in that region.
Light enters our eyes (in straight lines) through the pupil and our pupils dilate and contract based on how much light there is. This is how we see.



Light can be reflected and the reflected ray is always a straight line too.
Reflection is the effect of light bouncing from an object.
Light from the Sun can be both beneficial and dangerous.
Objects either allow all light to pass through them, partially allow light to pass through them, or do not allow any light to pass through them.
Shadows are the result of objects blocking the light.
The size of the shadow depends on the distance between the light source, the object and the 'screen'.
Light always travels in straight lines.
Some objects produce their own light and some objects reflect light.



Working scientifically (throughout the term)

Planning a range of investigations.
Setting up simple practical enquiries, comparative and fair tests.
Asking relevant questions and using different types of scientific enquiries to answer them.
Notice patterns in the way the size of shadows change.

Irreversible Changes

Core knowledge

Chemical reactions result in temperature increases, decreases, or no change.
Other signs of chemical reactions include bubbles, fire and smoke.
Chemical reactions always result in new substances being made.
Reactions can proceed at slow, medium and fast rates.
A colour change is a sign a chemical reaction has taken place.
Mass stays the same in a chemical reaction.
Electricity can start a chemical reaction.
Electrolysis is the process used to make metal plated items.
Reactions that produce light are called chemiluminescent reactions.
The colour of the glow can be changed depending on the reactants.
Light is a sign that a chemical reaction is taking place.
Not all chemical changes are irreversible.
In reversible reactions, new substance(s) are created which then break down back to the starting reactants.
Solutions are made by dissolving one substance in another.
There is only so much substance that can dissolve in a given amount of another.



Working scientifically (throughout the term)

Setting up simple practical enquiries, comparative and fair tests.
Identify variables.
Record data and results of increasing difficulty using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
Report and present findings both orally and written, from enquiries, including conclusions and causal relationships.
Also comment on explanations of and degree of trust in the result of the enquiries.
Gather, record, classify and present data in a variety of ways.

Living Things, Habitats & Lifecycles

Organisms are classified based on common characteristics.
Micro-organisms are organisms that cannot be seen with the naked eye.
Bacteria and viruses are two of the classes of micro-organisms: they can be either good or bad for health.
Animals are either hatched or born.
Different animals have different life cycles.
Animals need food, water, shelter, and warmth to thrive.
Animals adapt to their habitats and the plants and animals around them.
Humans go through several stages of development.
Changes that occur during these stages affect the person mentally and physically.
Plant seeds spread in a range of ways, for example using gravity, wind, water, animals and explosion.
Seeds germinate to produce young plants.
90% of all species of plants are flowering.
Local habitats vary and many local species have adapted to live in urban areas.
Great Britain is green because there tends to be a lot of annual rainfall.
Humans have had a huge impact (both positive and negative) on the natural world.
Air pollution, deforestation, water pollution and waste disposal are all concerns.



TYPES OF POLLUTION



Working scientifically (throughout the term)

Use scientific evidence to answer questions and support findings.
Notice patterns in data.
Identify differences, similarities or changes relating to scientific ideas and processes.

Year
5

Light, Earth & Space

Core knowledge

There are eight planets in the solar system: four are rocky planets and four are gas giants. The planets all travel in an elliptical orbit around the Sun because of its gravity.

It takes the Earth 365 days to orbit the Sun, planets that are further away take longer.

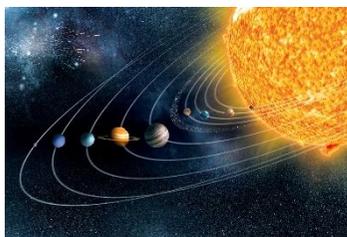
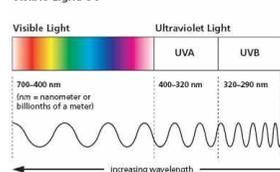
We see the same face of the Moon all the time, although we do see different phases.

The Sun, planets and most moons can be described as approximately spherical bodies.

It takes 24 hours for Earth to complete a full spin on its axis.

We see by light entering our eye, hitting the lens in our eyes and refracting to the back of the eye.

Visible Light/UV



Ultraviolet light from the sun can be both beneficial and maligned.

Objects can be transparent, translucent or opaque.

Shadows are the result of opaque objects blocking light

The size of a shadow can be dependent on many things. Light travels in straight lines as little packages called photons.

Objects which produce their own light are called luminous objects.

Objects which reflect light are called non-luminous or reflectors.

Working scientifically (throughout the term)

Planning different types of scientific enquiries to answer questions.

Setting up practical enquiries, comparative and fair testing.

Recognising and controlling variables where necessary.

Find patterns in how shadows change.

Changes

Core knowledge

Chemical reactions can result in temperature changes.

There are lots of signs of chemical reactions, for example smoke, light and colour change.

Chemical changes are usually irreversible, although not all of them are.

Chemical reactions always result in new substances being made.

Conditions can be changed in order to alter reaction rates.

Mass always stays the same in a reaction, although it can appear to be lost, gained, or stay the same in a chemical reaction due to gases produced by the reaction.

Electricity can start a chemical reaction and can be used to 'split' substances into positive and negative parts.

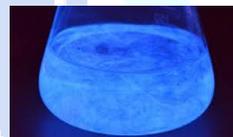
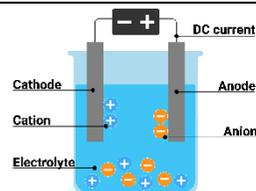
Electrolysis is the process used to make metal plated items.

Chemiluminescent reactions are temporary.

Light is a sign that a chemical reaction is taking place and this colour changes based on the reactants.

Reversible reactions are a two-step process at least.

Solutions are made by dissolving a solute into a solvent. There is only so much substance that can dissolve in a given amount of another.



Working scientifically (throughout the term)

Plan different types of enquiries to answer questions.

Recognise and control variables where necessary.

Record data and results of increasing complexity.

Use scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

Report and present findings from enquiries in oral and written forms, including conclusions and causal relationships.

Explain the degree of trust in results that have been gathered.

Gather, record, classify and present data in a variety of ways.

Living things, Habitats & Lifecycles

Core knowledge

Organisms are classified based on common characteristics.

Bacteria, viruses, fungi, algae and protozoa are all classes of micro-organism (microbe).

Bacteria and viruses can be good or bad for health.

DNA is the blueprint for making exact copies of the same species.

Different classifications of animals have different life cycles.

Animals hibernate, migrate or remain active all year round. Humans go through several stages of development and each stage has mental and/or physical affects.

Main changes during these development stages are a persons' bones, skin and eyesight.

Plant seeds are spread using gravity, wind, water, animals and explosion.

Seeds germinate to produce young plants.

Flowering plants need to be pollinated and this can happen in a variety of ways.

Cross-pollinated plants are stronger than self-pollinated.

A habitat is made up of a variety of factors. Great Britain is green because there tends to be a lot of annual rainfall.

An increasing human population is making the environmental situation worse. Air and water pollution, deforestation and waste disposal are all severe concerns.

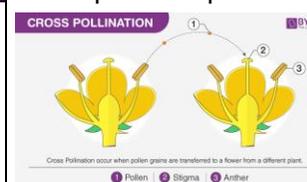
The plants and animals that are most adaptable are those that will survive.

Working scientifically (throughout the term)

Report and present findings from enquiries.

Identify conclusions and relationships from data collection. Evaluate the reliability of results.

Identify scientific evidence to support or refute scientific ideas or arguments.



Light, Earth & Space

Core knowledge

There are eight planets in the solar system: four are rocky planets and four are gas giants.

The Sun is made up of mainly Hydrogen and Helium.

The temperature of a planet decreases with distance.

The planets (which are oblate) all travel in an elliptical orbit around the Sun in an anti-clockwise direction.

The phases of the moon are due to the position of the Sun, Moon and Earth as it orbits the Earth.

Moonlight is reflected sunlight.

The Earth spins on its axis anti-clockwise.

Sunlight is a mix of infrared, visible and ultraviolet light.

UV light can help produce Vitamin D, but too much can also malign.

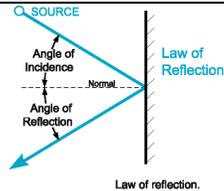
Light enters our eyes in straight lines through the pupil where it hits a double convex lens and is refracted to the retina: this is how we see objects.

Light travels as little packages called photons.

Objects can be transparent, translucent or opaque: opaque objects cause shadows.

The law of reflection is: The angle of incidence = the angle of reflection.

Different materials reflect light in different ways.



Changes

Core knowledge

Chemical reactions can result in temperature changes.

There are lots of signs of chemical reactions, for example smoke, light and colour change.

Chemical changes are usually irreversible, although not all of them are.

Chemical reactions always result in new substances being made.

Conditions can be changed in order to alter reaction rates.

Mass always stays the same in a reaction, although it can appear to be lost, gained, or stay the same in a chemical reaction due to gases produced by the reaction.

Electricity can start a chemical reaction and can be used to 'split' substances into positive and negative parts.

Electrolysis is the process used to make metal plated items.

Chemiluminescent reactions are temporary.

Light is a sign that a chemical reaction is taking place and this colour changes based on the reactants.

Reversible reactions are a two-step process at least.

Solutions are made by dissolving a solute into a solvent.

A solution is saturated when it can no longer dissolve any more solvent.

Solutions can be acidic, alkaline or neutral.



Working

scientifically (throughout the term)

Plan different types of enquiries to answer questions.

Recognise and control variables where necessary.

Record data and results of increasing complexity.

Use scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

Report and present findings from enquiries in oral and written forms, including conclusions and causal relationships.

Explain the degree of trust in results that have been gathered.

Gather, record, classify and present data in a variety of

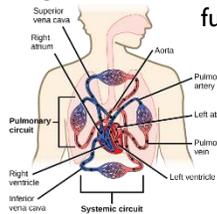
The Human Body

Core knowledge

Diet, exercise, drugs and lifestyle choices can all impact on how our bodies function.

Nutrients and water are transported through the body through blood.

The main parts of the human circulatory system are the lungs, heart, veins and arteries. They each have specific functions.



The heart pumps the blood around the body.

Veins transport blood to the heart.

Arteries transport blood away from the heart.

Working scientifically (throughout the term)

Living Things, Habitats & Lifecycles

Organisms are classified based on common characteristics.

Micro-organisms (microbes) are unseen by the naked eye. Bacteria, viruses, fungi, algae and protozoa are classes of microbes.

Bacteria and Viruses can be harmful but can also be used to make vaccines against diseases.

DNA is inside the nucleus of cells in organisms and has a double helix shape.



Animals usually go through different stages in order to become adults. Some animals just grow bigger (sharks).

Animals are adapted to their habitats and the plants and animals around them.

Animals hibernate, migrate or remain active all year.

Humans go through several stages and each stage has mental and physical affects.

Plant seeds are spread using gravity, wind, water, animals and explosion.

Plants have various life stages: they can live for thousands of years.

Pollination can occur in a variety of ways including insect, animal, wind and self-pollination.

Cross-pollinated plants are stronger than self-pollinated ones.

A habitat is made up of physical factors as well as factors such as availability of food and the presence of predators.

A habitat is not necessarily a geographic area, it can be a host body or a cell within the host's body.

An increasing human population is making the



environmental situation worse.

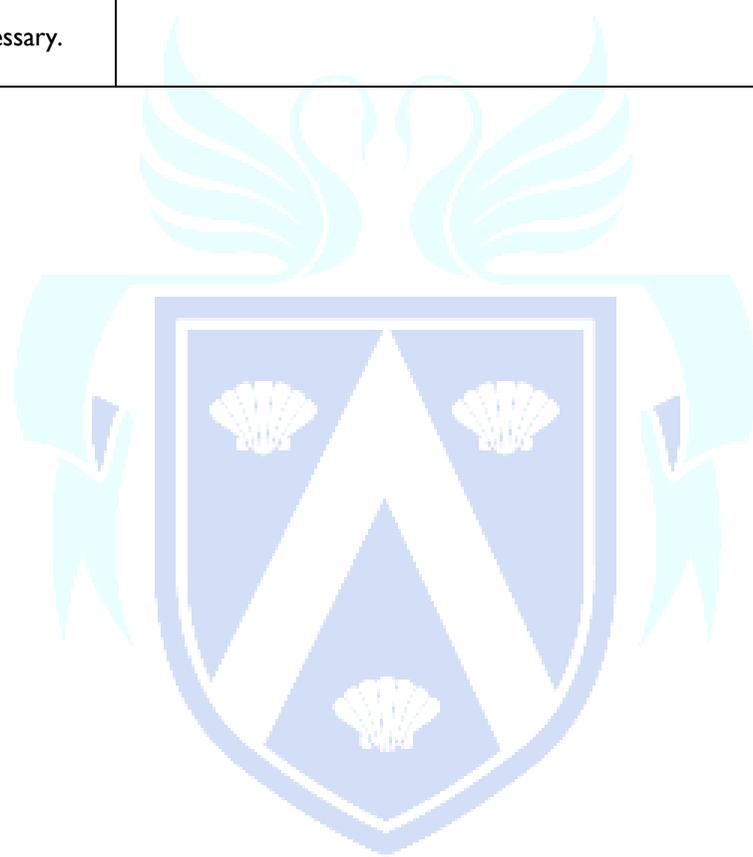
Air and water pollution, deforestation and waste disposal (including plastic disposal) are all severe concerns.

Working scientifically (throughout the term)

Use a range of keys and diagrams to classify living things.

Use secondary information to conduct research and form an opinion.

	<p>Planning different types of scientific enquiries to answer questions. Setting up practical enquiries, comparative and fair testing. Recognising and controlling variables where necessary. Find patterns in how shadows change.</p>	<p>ways.</p>	<p>Report and present findings from enquiries. Identify conclusions and relationships from data collection. Evaluate the reliability of results. Identify scientific evidence to support or refute scientific ideas or arguments.</p>
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ELSTOW
SCHOOL