# Year 1 Science Knowledge Organiser
## Seasonal Changes

Oyster Park Primary Academy
Ambition · Bravery · Respect

## What I should already know?

**Knowledge:**
- I can talk about some of the things I have observed such as plants, animals, natural and found objects.' in Reception,
- I have an understanding of growth, decay and changes over time.
- I can show care and concern for living things and the environment.

**Skills:**
- Asking simple questions
- Observing plants and talking about changes
- Recognising the differences between the parts of a plant.

## New Learning

- To make observations of all four seasons
- To name all four seasons
- To describe to key features of the four seasons
- To observe and describe weather associated with the seasons
- To talk about how the day length changes in each season

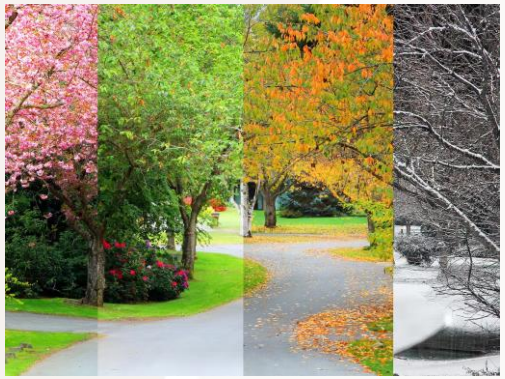
## Famous in this field

Greta Thunberg - Greta Thunberg is a Swedish activist who works to address the problem of climate change. She is the founder of a movement known as Fridays for Future..

## Key Vocabulary

| Vocabulary | Definition |
|---|---|
|  Daylight | The time after sunrise and before sunset while it is light outside. |
|  Spring | The season after winter, the plants start to come back to life and the weather is warmer. |
|  Summer | The season after Spring, the days are longer and the weather is hot. |
|  Autumn | The season after Summer, the weather is cooler and the leaves start to change colour. |
|  Winter | The season after Autumn, the weather is cold, sometimes it snows. |

## Sticky Knowledge



**There are four seasons, Spring, Summer, Autumn and Winter.**

**The weather changes in each season. The changes in each season can be seen when looking at plants and trees.**

**Temperature is the amount of heat in something. The temperature changes in each season.**

**In the Summer daylight hours are longer than in the winter**.

# Year 1 Science Knowledge Organiser
## Animals including Humans

Oyster Park Primary Academy
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## What I should already know?

**Knowledge:**
- I can I can understand the key features of the life cycle of an animal.
- I can begin to understand the need to respect and care for the natural environment and all living things.
- I can explore the natural world around me by completing investigations and observations, for example minibeast hunts
- I can name some parts of my body.
- I can name some familiar animals such as pets.

**Skills:**
- Asking simple questions
- Observing living things in my local environment

## New Learning

- To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
- To identify and name a variety of common animals including herbivores, omnivores and carnivores
- To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)

## Famous in this field

Edward Tyson – Was an English Scientist and Physician. He the founder of modern comparative anatomy, which compares the anatomy between species. For example he compared humans and chimpanzees.

## Key Vocabulary

| Vocabulary | Definition |
|---|---|
|  Mammal | A mammal is an animal that breathes air, has a backbone, and grows hair at some point during its life. |
|  Bird | Birds are vertebrate animals that have feathers, wings, and beaks |
|  Reptile | Reptiles are cold-blooded vertebrates. They have dry skin covered with scales or bony plates and usually lay soft-shelled eggs.. |
|  Amphibian | Amphibians are cold-blooded vertebrates that don't have scales. They live part of their lives in water and part on land. |

## Sticky Knowledge

**Mammals breathe air, have a backbone and grow hair on their body.**

**Birds are vertebrates, have feathers, wings and a beak.**

**Not all birds can fly.**

**Reptiles are cold blooded. They have dry skin and lay eggs.**

**Amphibians are cold blooded, they don't have scales and they live in water and on land.**

**A vertebrate has a back bone.**

**A carnivore easts meat.**

**A herbivore does not eat meat, it eats plants.**

**An omnivore eats meat and plants.**

# Year 2 Science Knowledge Organiser
## Use of Everyday Materials

Oyster Park Primary Academy
Ambition · Bravery · Respect

## What I should already know?

**Knowledge:**
- I can identify and name a variety of materials including wood, plastic, glass, metal, water and rock
- I can describe the simple physical properties of a variety of everyday materials
- I can compare and group together a variety of everyday materials on the basis of their physical properties

**Skills:**
- Asking simple questions and recognising that they can be answered in different ways.
- Observing closely, using simple equipment
- Performing simple tests.
- Identifying and classifying.
- Using their observations and ideas to suggest answers to questions.

## New Learning

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

## Famous in this field

Maria Telkes- best known for designing the first solar-powered heating system for houses- looking at how the materials impact on the heat.

## Key Vocabulary

| Vocabulary | Definition |
|---|---|
|  Properties | The property of a material is something about it that we can measure, see or feel and helps us decide whether or not it is the best material. |
|  Suitability | Is the material the best choice for the job it needs to do? Is it suitable? |
|  Mould | Change the shape of a material. |
|  Waterproof | Something that keeps water out. |
|  Stretch | To stretch is to extend or lengthen something beyond the normal length. |

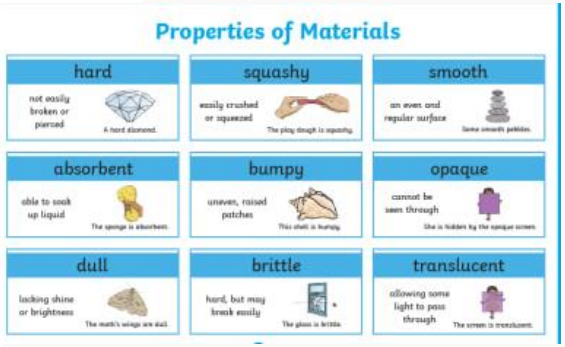
## Sticky Knowledge

**Different materials are suitable for different uses.**

**Different materials have different properties which make them suitable for different uses.**

**The shapes of different objects can by changed by squashing, twisting, stretching, bending.**

**The properties of the material determine how they can be changed.**



# Year 2 Science Knowledge Organiser
## Plants

Oyster Park Primary Academy
Ambition · Bravery · Respect

## What I should already know?

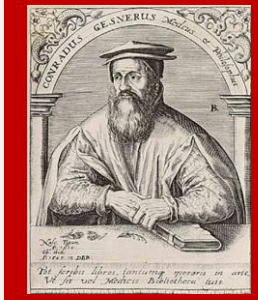
**Knowledge:**
- I can identify and name a variety of common wild and garden plants including deciduous and evergreen trees
- I can identify and describe the basic structure of a variety of common flowing plants, including trees.
- on the basis of their physical properties

**Skills:**
- Asking simple questions and recognising that they can be answered in different ways.
- Observing closely, using simple equipment
- Performing simple tests.
- Identifying and classifying.
- Using their observations and ideas to suggest answers to questions.

## New Learning

- To observe and describe how seeds and bulbs grow into mature plants
- To find out and describe how plants need light, water and suitable temperature to grow and stay healthy

## Famous in this field



Conrad Gesner- published a drawing of a strip of graphite inside a tube of wood — the first depiction of a wood pencil.

## Key Vocabulary

| Vocabulary | Definition |
|---|---|
|  Germination | When a seed is sown into moist soil, it begins to grow. This process is called Germination. |
|  Pollination | So that plants can make seeds, pollen grains usually have to be transferred from one plant to another. This process is called pollination. |
|  Seed Dispersal | Seed dispersal is the way seeds get away from the parent plant to a new place. "Dispersal" means to spread or scatter. |
|  Nutrition | Nutrition is how animals and plants get the food they need to grow healthy and strong. |

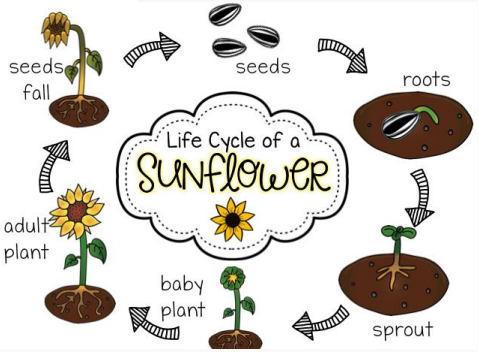
## Sticky Knowledge

**Plants need water, light and a suitable temperature to grow and stay healthy**

**If plants do not have the right conditions to grow they will die.**

**When a seed germinates it begins to grow. A shoot grows out of the seed or bulb.**

**Seed dispersal is the way seeds leave a plant to germinate and grow new plants.**



# Year 3 Science Knowledge Organiser
## Forces and Magnets

Oyster Park Primary Academy
Ambition · Bravery · Respect

## What I should already know?

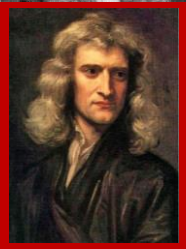
**Knowledge:**
- I can talk about different forces I can feel.
- I know about the forces of push, pull, up, down, spin, twist, stretch, rub, slide, sink, float

**Skills:**
- Asking simple questions and recognising that they can be answered in different ways.
- Observing closely, using simple equipment
- Performing simple tests.
- Identifying and classifying.
- Using their observations and ideas to suggest answers to questions.

## New Learning

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

## Famous in this field



Isacc Newton- was a scientist best known for discovering gravity. He described it as a 'pulling force.

## Key Vocabulary

| Vocabulary | Definition |
|---|---|
|  Magnet | A magnet is a metal which attracts or repels other materials. A magnet is made from magnetic materials such as iron, nickel, steel, or cobalt. |
|   Repel | To push away. |
|   Attract | To pull together. |
|  Poles | A magnet has two ends, called poles. One end is the north pole, and the other is the south pole. |

## Sticky Knowledge

All magnets have two ends - a north pole and a south pole.

Magnetism is a force.

Magnetism either attracts magnetic objects or pushes them away.

If the same poles of two magnets are placed near each other they push away and repel.

If two different poles are placed near each other they attract and pull together.

If an object is attracted to a magnet it is classified as magnetic.

If an object is not attracted to a magnet is classified as not magnetic.

Friction is a force between two surfaces that are sliding, or trying to slide, across each other.

# Year 3 Science Knowledge Organiser
## Plants

Oyster Park Primary Academy
Ambition · Bravery · Respect

## What I should already know?

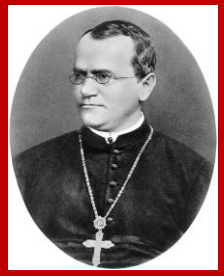
**Knowledge:**
- I can observe and describe how seeds and bulbs grow into mature plants
- I know plants need light, water and suitable temperature to grow and stay healthy
- I know plants germinate in order to begin to grow
- I can describe the life cycle of a plant

**Skills:**
- Asking simple questions and recognising that they can be answered in different ways.
- Observing closely, using simple equipment
- Performing simple tests.
- Identifying and classifying.
- Using their observations and ideas to suggest answers to questions.

## New Learning

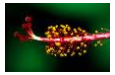
- To identify and describe the functions of different parts of flowering plants: roots, stem/trunk leaves and flowers.
- To explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.
- To investigate the way in which water is transported within plants..
- I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

## Famous in this field



Gregor Mendel- He founded genetics by his work cross-breeding pea plants

## Key Vocabulary

| Vocabulary | Definition |
|---|---|
| Fertilisationt | When pollen reaches the new flower and travels to the ovary where it fertilises egg cells (ovules) to make seeds. This is fertilisation. |
|  Stamen | The stamens produce fine, dust-like grains, called pollen |
|  Sepal | The part of a plant, shaped like a leaf, that lies at the base of a flower. Sepals hold and protect developing flower buds |
|  Pollinator | A pollinator helps the pollination process by moving pollen from one plant to the next. |

## Sticky Knowledge

I know parts of a plant have different roles.

The roots keep the plant in the ground and absorb water and nutrients.

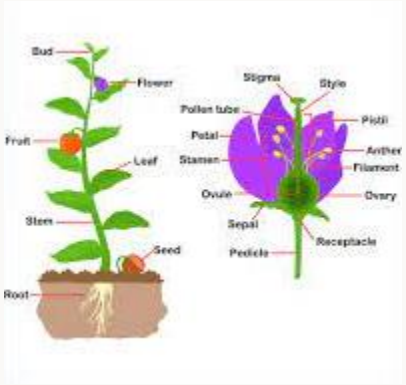
The stem supports the plant and transports water and nutrients.

The leaves help the plant make food for itself.

The sepal protects the developing flower buds.

The stamen produces pollen.

The movement of water in plants is called transpiration. This is where water evaporating from the leaves of a plant causes the plant to draw up more water from the roots. Water moves up the stem to the other parts of the plant.



# Year 4 Science Knowledge Organiser
## Electricity

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## What I should already know?

**Knowledge:**
- I know that we need electricity for everyday things such as turning on the light when it gets dark and charging a mobile phone.

**Skills:**
- Asking relevant questions and using different types of scientific enquiries to answer them
- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.

## New Learning

- To describe why a bulb won't light and identify the problem within the circuit.
- To construct and record a simple series circuit, and name its basic parts, including cells, wires, bulbs, switches and buzzers.
- To know that a bulb lights up when there is an effective conducting material in the circuit and is part of a complete circuit.
- To describe what happens when making and breaking a circuit, recognise that a switch opens and closes a circuit and link to the lighting of a bulb.
- I can recognise common conductors and insulators and associate metals with being good conductors

## Famous in this field

Garrett Augustus Morgan, Sr. (March 4, 1877 – July 27, 1963) was an American inventor, businessman, and community leader. His most notable invention was the first traffic lights.

## Key Vocabulary

| Vocabulary | Definition |
|---|---|
|  Conductor | Some materials let electricity pass through them easily. These materials are known as electrical conductors. |
|  Insulator | Some materials do not allow electricity to pass through them. These materials are known as electrical insulators. |
|  Component | A component is a part of something, for example a light bulb is a component of a circuit. |
|  Current | Current is the flow of an electric charge. |
|  Circuit | A circuit is a complete path around which electricity can flow. |

## Sticky Knowledge

**A circuit must be complete in order for a bulb to light.**

**If a circuit is not complete the electrical current cannot flow around the whole circuit.**

**A series circuit is a simple pathway that lets electricity flow to one or more components such as a light bulb or a motor.**

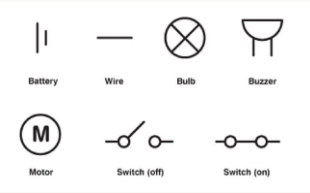
**A conductor is a material that allows electrical current to travel through it.**

**An insulator is a material that does not allow electrical current to flow through it.**

**A switch opens and closes a circuit. When a switch is open the circuit is broken, when the switch is closed the circuit is completed.**

**Many metals, such as copper, iron and steel, are good electrical conductors.**

**Plastic, wood, glass and rubber are good electrical insulators. That is why they are used to cover materials that carry electricity.**



# Year 4 Science Knowledge Organiser
## Sound

Oyster Park Primary Academy
Ambition · Bravery · Respect

## What I should already know?

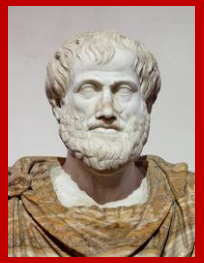
**Knowledge:**
- I know one of the five senses is hearing.
- I know the body part associated with hearing is the ear.

**Skills:**
- Asking relevant questions and using different types of scientific enquiries to answer them
- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.

## New Learning

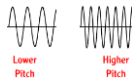
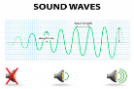
- To identify how sounds are made, associating some of them with something vibrating
- To recognise that vibrations from sounds travel through a medium to the ear
- To find patterns between the pitch of a sound and features of the object that produced it
- To find patterns between the volume of a sound and the strength of the vibrations that produced
- To recognise that sounds get fainter as the distance from the sound source increases

## Famous in this field



Aristotle - The Ancient Greek Philosopher called Aristotle believed that sound and light were carried through air like waves.
He believed that they couldn't travel through a vacuum. Many centuries later scientists could create a vacuum to test Aristotle's theory

## Key Vocabulary

| Vocabulary | Definition |
|---|---|
|  Vibrations | Vibration means moving very quickly back and forth. When you pluck a guitar string, or hit a drumskin, you can see the material vibrate. |
|  Sound Wave | Sound travels as waves, which are vibrating particles. |
|  Decibels | The unit of measure used when measuring the loudness of sound. |
|  Pitch | The pitch of a sound is how high or low the sound is. |
|  Volume | The volume of a sound is how loud or quiet the sound is. |

## Sticky Knowledge

**Sound is caused by vibration. If an object vibrates the air particles called molecules close to it vibrate. This makes the molecules next to them vibrate and so on, forming a sound wave.**

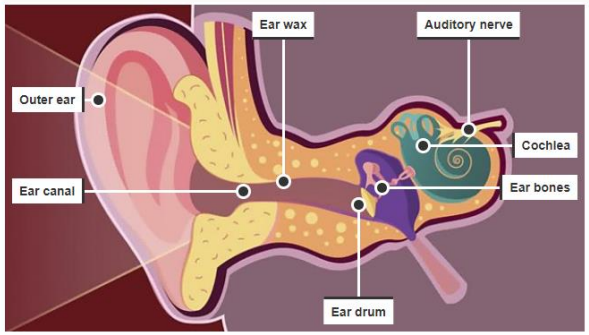
**If the sound wave reaches our ears and our brains then we hear the sound.**

**Sound needs a medium to travel through. Air is a medium.**

**The louder the volume of the sound is the stronger the vibrations making the sound wave are.**

**The ear drum is a thin layer of tightly stretched skin. It vibrates when sound waves hit it.**

**Cochlea is a spiral tube. When the stirrup moves, fluid inside the cochlea moves. Hearing receptors turn the movement into signals which travel to the brain.**



# Year 5 Science Knowledge Organiser
## Animals including Humans

Oyster Park Primary Academy
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## What I should already know?

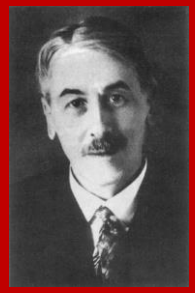
**Knowledge:**

- I have an understanding of growth, decay and changes over time.
- I can talk in simple terms about how animals grow & reproduce.
- I 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.
- **Skills:**
- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

## New Learning

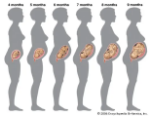
- To describe the changes that take place as humans develop from birth to old age.
- To understand about the changes that take place during puberty.
- To have the knowledge needed to draw a timeline to indicate stages in the growth and development of humans.

## Famous in this field



Franz Baron Nopcsa- was a self-taught palaeontologist who spent his life pushing the boundaries of scientific understanding concerned with the growth of animals

## Key Vocabulary

| Vocabulary | Definition |
|---|---|
| ♀♂ Sexual Reproduction | Sexual reproduction is a form of reproduction in which genetic material from two individuals of opposite sexes mixes to create offspring. |
|  Puberty | ' Puberty is the time when a boy or girl's body begins to develop and change as they become an adult. |
|  Gestation | Gestation is the period of development where some animals carry their babies inside their bodies before they give birth. |

## Sticky Knowledge

**Human life cycle**
**There are six stages in the human life cycle:**

**1. Foetus**
**At this time, a baby is growing inside its mum's womb.**

**2. Baby**
**A baby is born after spending nine months inside the womb.**

**3. Childhood**
**At this stage, you learn to walk and talk.**

**4. Adolescence**
**Children become teenagers.**

**5. Adulthood**
**Your body is fully developed.**

**6. Old age**
**The last stage in the life cycle of a human.**

**During puberty boys and girls bodies change, this is due to the changes in hormone levels. Some of the changes include growing pubic hair, girls begin to develop breasts and boys voices become deeper.**

# Year 5 Science Knowledge Organiser
## Living Things and their Habitats

Oyster Park Primary Academy
Ambition · Bravery · Respect

## What I should already know?

**Knowledge:**

- I can describe features of plants and animal and compare similarities and differences between sub-groups, recognising that all living things can be grouped in different ways.
- I can use a simple key to represent and identify animals and plants in local habitats.
- I can construct and interpret a variety of food chains, identifying producers, predators and prey.
- I can recognise that environments can change and that this can pose dangers to living things.

**Skills:**

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

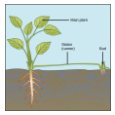
## New Learning

- To describe and explain the differences in the life cycles of a mammal, an amphibian, an insect and a bird.
- To describe using scientific vocabulary the key functions of a plant, including reproduction.
- To describe the features and function of the stigma, root and leaf.
- To describe the life process of reproduction in some plants and animals.
- To use keys based on external features to help identify and group living things systematically

## Famous in this field

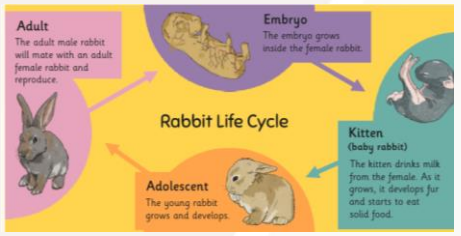
Sir David Attenborough is a natural historian and broadcaster who has introduced millions of people to a variety of animals from around the world.

## Key Vocabulary

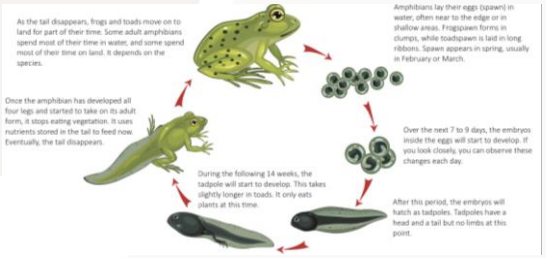
| Vocabulary | Definition |
|---|---|
| ♀♂ Reproduction | Sexual reproduction requires two parents to reproduce to create offspring. It involves a male gamete (sex cell) and a female gamete (sex cell) from two parents. |
|  Asexual Reproduction | Some plants can also reproduce without an egg cell being fertilised to produce a seed. Instead, these plants produce an identical copy of themselves. This type of reproduction is known as asexual reproduction. |
|  Metamorphosis | Metamorphosis is a process some animals go through to become adults. |

## Sticky Knowledge

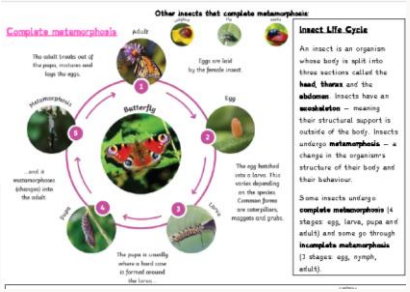
Life Cycle of a Mammal:




Life cycle of an Amphibian:



Life cycle of an Insect:




Plants are able to reproduce in two different ways - sexual reproduction and asexual reproduction.

Sexual reproduction involves pollen from one flower fertilising the egg of another to produce a seed.
Only one parent is needed in asexual reproduction and the offspring are exact copies.

# Year 6 Science Knowledge Organiser
## Evolution & Inheritance

Oyster Park Primary Academy
Ambition · Bravery · Respect

## What I should already know?

**Knowledge:**

- I can notice that animals, including humans, have offspring which grow into adults.
- I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air).
- I can identify that humans and some other animals have skeletons and muscles for support, protection and movement.
- I can describe features of plants and animal and compare similarities and differences between sub-groups, recognising that all living things can be grouped in different ways.

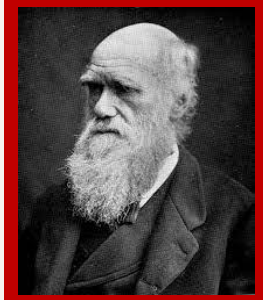
**Skills:**

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- identifying scientific evidence that has been used to support or refute ideas or arguments.

## New Learning

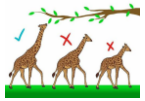
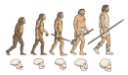
- To recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago.
- To recognise that living things produce offspring of the same kind, but normally offspring vary and are not be identical to their parents.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

## Famous in this field



Charles Darwin was an English scientist who studied nature. He is known for his theory of evolution by natural selection. According to this theory, all living things are struggling to survive. The living things that have the most helpful traits for their environment tend to survive. These living things then pass along their helpful traits to their young. In this way, animals change, or evolve, over hundreds of years.

## Key Vocabulary

| Vocabulary | Definition |
|---|---|
|  Inheritance | When living things reproduce they pass on characteristics to their offspring. This is known as inheritance. |
|  Natural Selection | Natural selection is the process through which populations of living organisms adapt and change. |
|  Adaption | Adaptations are any physical or behavioural characteristics of an animal that help it to survive in its environment. |
|  Evolution | Evolution is the way that living things change over time. |

## Sticky Knowledge

Adaptation is when a plant or animal has changed in some way, usually over a long period of time, to be better suited to the environment in which they live.

Evolution is the process by which different kinds of living organisms are believed to have developed from earlier forms during the history of the Earth.

Natural selection is when the fittest, most adapted organisms survive and multiply whilst the least adapted die out.

Inheritance is the reception of genetic qualities by transmission from parent to offspring.

There are some key characteristics that we inherit from our birth parents. These include your eye colour, skin colour, shape of your ears and whether you can roll your tongue or not.

Species are a group of similar organisms that are able to reproduce.

Fossils are the preserved remains or traces of dead organisms. They show us how living things and the environment have changed since the time they were alive.

# Year 6 Science Knowledge Organiser
## Living Things and their Habitats

Oyster Park Primary Academy
Ambition · Bravery · Respect

## What I should already know?

Knowledge:

- I can describe and explain the differences in the life cycles of a mammal, an amphibian, an insect and a bird.
- I can describe using scientific vocabulary the key functions of a plant, including reproduction.
- I can describe the features and function of the stigma, root and leaf.
- I can describe the life process of reproduction in some plants and animals.
- I can use keys based on external features to help identify and group living things systematically

- Skills:
- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- identifying scientific evidence that has been used to support or refute ideas or arguments.

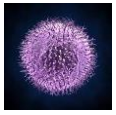
## New Learning

- To describe the feeding relationships between plants and animals in a range of habitats.
- I 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.
- I can give reasons for classification of plants and animals based on specific characteristics

## Famous in this field

Carolus Linnaeus was a Swedish naturalist. He created two scientific systems: the system for classifying plants and animals and the system for naming all living things.

## Key Vocabulary

| Vocabulary | Definition |
|---|---|
|  Micro Organism | Microorganisms are living things that are too small to be seen with the naked eye. |
|  Classification | Animals can be divided into groups or 'classified' by looking at the similarities and differences between them. |
|  Bacterium | Bacteria are among the smallest living things. A single bacterium consists of just one cell |
|  Species | Species refers to a group of similar organisms that are able to reproduce. |

## Sticky Knowledge

**Classification is putting things into groups. Living things can be divided into these groups or 'classified' by looking at similarities and differences between the way they look and behave.**

**Animals are divided into two main groups. Animals that have a backbone (spine) are called vertebrates. Animals that don't have a backbone are called invertebrates.**

**Vertebrates and invertebrates are divided into smaller groups.**

**A key is a set of questions about the characteristics of living things. The answer to the first question gives you another question to answer and so on. As you answer more questions you narrow down your living thing until eventually the last question tells you what it is.**

**There are 5 main types of micro organism:**
**Bacteria, viruses, fungi, algae and protozoa.**

**Different habitats have a different feeding relationship between plants and animals. These are called food chains.**