

## Year 5-Animals including Humans- Autumn 1 Term Knowledge Organiser

What should I already know?

Building on Yr 1 and 2 to identify features of the body that change and moving on to more complex and internal changes.

## What is significant about Kingston Upon Hull?

### Key vocabulary

Fertilisation-the process of the male and female sex cells fusing together.

Prenatal- the stage of development from the time of fertilisation to the time of birth.

Gestation-the process or time when prenatal development takes place before birth.

Reproduce-to produce young.

Asexual reproduction- a process where one parent produces new life.

Sexual reproduction- a process where two parents – one male and one female – are required to produce new life.

Life cycle- the changes a living thing goes through, including reproduction

Adolescence- the social and emotional stage of development between childhood and adulthood.

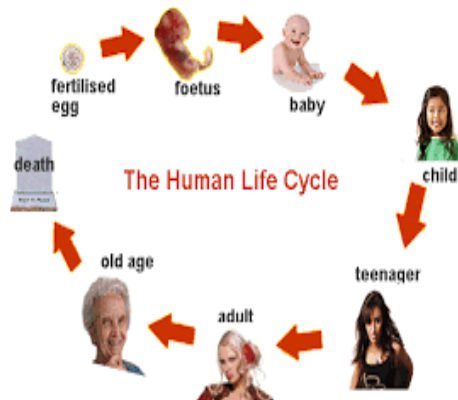
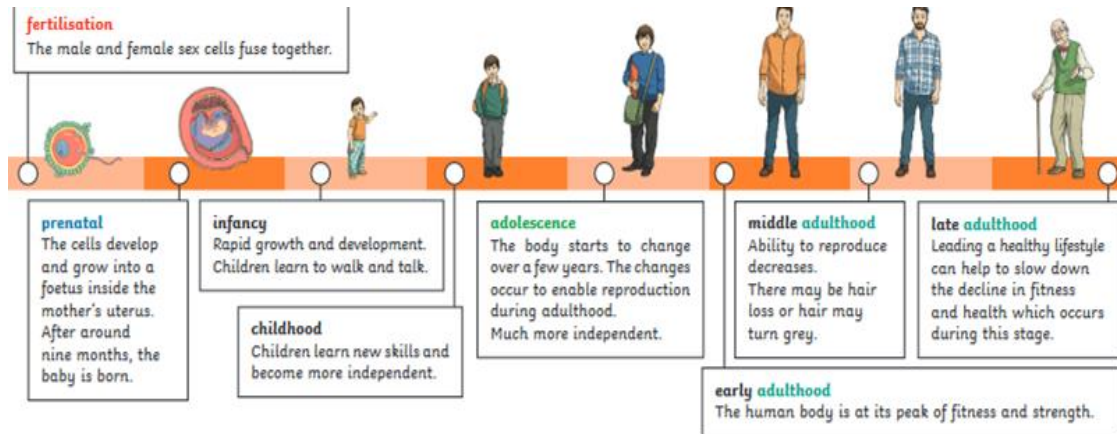
Puberty- the physical stage of development between childhood and adulthood.

Menstruation-when the female body discharges the lining of the uterus. This happens approximately once a month. Adulthood- the stage of development when a human is fully grown and mature.

Life expectancy- the length of time, on average, that a particular animal is expected to live.

National Curriculum objectives:

➤ describe the changes as humans develop to old age.



### Growth and Development of Animals

Humans	House Mice	African Elephants	Saltwater Crocodiles	Blue Whales
Gestation Period: 9 months	Gestation Period: 20 days	Gestation Period: 22 months	Gestation Period: 2-3 months	Gestation Period: 10-12 months
Sexual Maturity: 11-17 years	Sexual Maturity: 4-6 weeks	Sexual Maturity: 10-12 years	Sexual Maturity: 10-12 years	Sexual Maturity: 10 years
Life Expectancy: 80 years	Life Expectancy: 1 year	Life Expectancy: 60 years	Life Expectancy: 70 years	Life Expectancy: 90 years

## Year 5-Properties and changes of materials- Autumn 2

### Term Knowledge Organiser

#### What should I already know?

In Year 2 and 3, children look at the properties of materials to group and compare. They also consider how properties of materials make them suitable or not suitable for a particular purpose.

#### National Curriculum objectives:

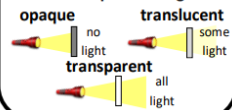
- compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

## How do rivers differ?

All materials can be grouped or compared based on their properties

### Opacity

The amount of light a material allows to pass through it



### Magnetism

Some metals (those containing iron) are attracted to a magnet



### Flexibility

Can be bent without breaking



### Absorbency

A material's ability to soak up water (opposite: waterproof)

### Hardness

Materials that are hard to scratch and dent (durable)



### Strength

Materials that are difficult to break or bend

### Conductivity (thermal)

A material that allows heat to travel through it easily is a good conductor of heat



Thermal insulators are bad conductors of heat

### Conductivity (electrical)

A material's ability to allow electricity to flow through it (metals)



Electrical insulators do not allow electricity to flow through them



## Separating Mixtures

When materials have been mixed together, sometimes it is possible to separate them again (the mixing process can be reversed)



## Changes of Materials

Some changes to materials can be reversed, while some changes cannot be reversed

### reversible changes

This is a change that can be undone

### irreversible changes

This is a permanent change (can't be undone)

## Solubility

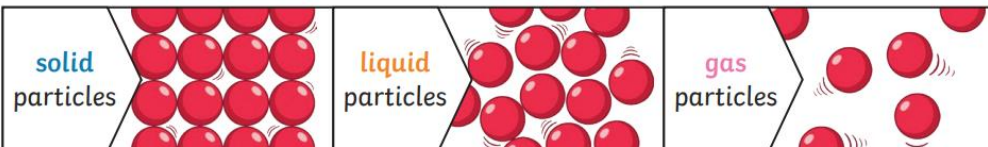
Some materials dissolve in water. This means they break apart into tiny pieces, spread out in the water and can no longer be seen. This mixture is called a solution



**soluble**  
(will dissolve)



**insoluble**  
(will NOT dissolve)



## Year 5-Living things and their habitats- Spring- Term Knowledge Organiser

### What should I already know?

In Year 3, children learn the life cycle of plants. Earlier in Year 5, children have learnt about the life cycle of humans.. Children know animals reproduce to create offspring.

### Key vocabulary

Asexual reproduction-one parent is needed to create an offspring, which is an exact copy of the parent.

Fertilise-the action of fusing the male and female sex cells in order to develop an egg.

Gestation- the length of a pregnancy.

Life cycle-the journey of changes that take place throughout the life of a living thing including birth, growing up and reproduction.

Metamorphosis- an abrupt and obvious change in the structure of an animal's body and their behaviour.

Pollination-the transfer of pollen to a stigma to allow fertilisation.

Reproduction-the process of new living things being made.

Sexual reproduction-two parents are needed to make offspring which are similar but not identical to either parent.

### National Curriculum objectives:

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- describe the life process of reproduction in some plants and animals.



## How has the Victorian period affected our lives?

### Naturalists and Animal Behaviourists

#### Naturalists

A natural scientist, or naturalist, studies animals and plants by observation, rather than by experimenting.

One example of a naturalist is Sir David Attenborough, who is known for presenting information and findings about animals through innovative and engaging television programmes.

Other naturalists include:

- Charles Darwin
- Alfred Russel Wallace
- Steve Irwin



#### Animal Behaviourists

Animals behaviourists make scientific studies of everything that animals do, from observations to experimentation.

One example of an animal behaviourist is Dr Jane Goodall, who is best known for her 55-year study of the behaviour of chimpanzees. She is the founder of a conservation institute.

Others include:

- Karl von Frisch
- Konrad Lorenz
- Nikolaas Tinbergen.



### Animal Life Cycles

**A life cycle is the series of changes that an animal goes through in its life, including reproduction.**

#### Mammals

-Mammals have a 3-stage life cycle:

-Stage 1: The gestation period - the embryo grows inside the mother & is dependent on her.

-Stage 2: The young mammal grows and develops independence.

-Stage 3: Adult mates in order to reproduce.



#### Amphibians

-Many amphibians have a 5-stage life cycle:

-Stage 1: Female lays eggs, fertilized by the male.

-Stage 2: Tadpole breathes in water through gills.

-Stage 3: Grows fins and develops lungs.

-Stage 4: Tadpole grows front legs. Jumps from water onto land.

-Stage 5: Starts to eat insects/plants. Takes 2-4 years to become adult.

#### Insects

-Most insects undergo metamorphosis and have a life cycle of 4 stages:

-Stage 1: Eggs laid by female insect.

-Stage 2: Eggs hatch into larva, e.g. caterpillars, maggots, grubs.

-Stage 4: The pupa (hard coating) is formed. Inside this, the larva transforms.

-Stage 5: The adult breaks out of the pupa and matures.

#### Birds

-Birds have a 3-stage life cycle:

-Stage 1: Eggs laid by the mother. Parents care for the egg until hatching.

-Stage 2: Mother and father feed the bird until it is independent.

-Stage 3: Adult mates in order to reproduce.



### Plant Life Cycles

**Plants are able to reproduce in two ways – sexual reproduction and asexual reproduction.**

Sexual reproduction in plants is cyclical, following this process:

1. Germination - The plant begins to grow from a seed. Roots form under the soil and a stem, leaves and flower shoots above the surface.

2. Pollination - Pollen produced by the flower is carried by insects or blown by the wind to another flower.

3. Fertilisation - The pollen reaches another flower and makes its way to the ovary, where it is fertilised.

4. Dispersal - The seeds are scattered by animals or the wind.

Asexual reproduction involves plants producing an identical copy of themselves.

This can happen in a number of different ways. Some plants are able to produce bulbs (e.g. daffodils and snowdrops). Others, like potatoes produce tubers. Tubers lie below the soil, and grow into plants the next year.





## Year 5-Earth and Space- Summer 1 Term Knowledge Organiser

What should I already know?

Children understand from KS1 how daylight changes over different seasons and are now looking at changes over the course of a day and reasons for these changes.

### How can we make £5 blossom?

#### Key vocabulary

Sun- a huge star that Earth and the other planets in our solar system orbit around.

Star- a giant ball of gas held together by its own gravity.

Moon-a natural satellite which orbits Earth or other planets.

Planet-a large object, round or nearly round, that orbits a star.

Sphere-a round 3D shape in the shape of a ball.

Spherical bodies- astronomical objects shapes like spheres.

Satellite-any object or body in space that orbits something else, for example: the Moon is a satellite of Earth.

Orbit-to move in a regular, repeating curved path around another object.

Rotate-to spin. E.g. Earth rotates on its own axis.

Axis-an imaginary line that a body rotates around. E.g. Earth's axis(imaginary line) runs from the North Pole to the South Pole.

Geocentric model- a belief people used to have that other planets and the Sun orbited around Earth.

Heliocentric model-the structure of the Solar System where the planets orbit around the Sun.

Astronomer- someone who studies or is an expert in astronomy (space science).

#### National Curriculum objectives:

- describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- describe the movement of the Moon relative to the Earth
- describe the Sun, Earth and Moon as approximately spherical bodies
- use the idea of the Earth's rotation to explain day and night, and the apparent movement of the sun across the sky.



### The Sun and the Moon



-The **Sun** is a star: a huge ball of hot gas that gives off light & heat. The Earth (and all of the planets in the Solar System) orbit the Sun.

-It takes the Earth just over 365 days to make one complete orbit around the Sun – this is one year. The Earth and other planets are held in place around the Sun by gravity – the same force that keeps you on the Earth!

-The Earth is always spinning around. When a point on Earth is facing the Sun, it is daytime. When facing away, it is nighttime. It takes 24 hours for the Earth to complete a spin (one day).

-Some objects orbit around the planets. These are called moons. The Earth has one moon (just called The Moon). The Moon is much smaller than the Earth, and takes one full day to complete an orbit around the Earth.

### Planet Facts

Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune
Area: 0.147 Earths 6 <sup>th</sup> Largest	Area: 0.902 Earths 6 <sup>th</sup> Largest	Area: 1 Earth! 5 <sup>th</sup> Largest	Area: 0.284 Earths 7 <sup>th</sup> Largest	Area: 121.9 Earths 1 <sup>st</sup> Largest	Area: 83.7 Earths 2 <sup>nd</sup> Largest	Area: 15.91 Earths 3 <sup>rd</sup> Largest	Area: 14.98 Earths 4 <sup>th</sup> Largest
Moons: None	Moons: None	Moons: 1 moon	Moons: 2 moons	Moons: Around 80 moons	Moons: Around 65 moons	Moons: Around 30 moons	Moons: Around 15 moons
Length of Day: 1,408 hours	Length of Day: 5,832 hours	Length of Day: 24 hours	Length of Day: 25 hours	Length of Day: 10 hours	Length of Day: 11 hours	Length of Day: 17 hours	Length of Day: 16 hours
Length of Year: 88 days	Length of Year: 225 days	Length of Year: 365 days	Length of Year: 687 days	Length of Year: 12 Years	Length of Year: 29 Years	Length of Year: 84 Years	Length of Year: 165 Years

-The **Earth** (our planet) is a part of the **Solar System**. At the centre of the Solar System is the **Sun**. The Sun is a **star**.

-There are 8 planets and 5 dwarf planets in the Solar System, which orbit (go around) the Sun.

-It takes Earth just over 365 days to go around the Sun (one year).

-The Earth rotates on its axis once every 24 hours (one day). This causes day and night, as different parts of the planet face the Sun.

-The Moon orbits around the Earth. The Sun, Earth and Moon are all roughly spherical.

#### The Planets

Mercury

Venus

Earth

Mars

Jupiter

Saturn

Uranus

Neptune

## Year 5-Forces- Summer 2 Term Knowledge Organiser

### What should I already know?

In Year 3, children learnt about friction and how objects move on different surfaces.

### National Curriculum objectives:

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect



## How has Ancient Greece changed the world?

### Key vocabulary

Forces- 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 it 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, across each other.

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 in a machine. Examples of mechanisms are pulleys, gears and levers.

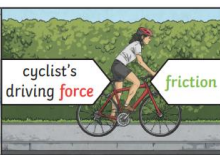
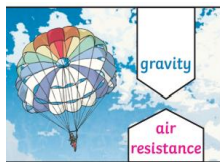
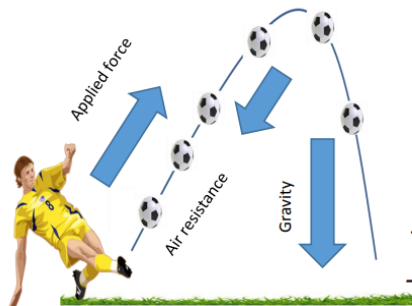
### Definitions of Forces

There are a number of different forces that affect us in our daily lives:

-**Applied force:** The force placed on an object by a living creature.

- (see 'Gravity' definition bottom left);
- **Friction:** the 'sticking' force that occurs when an object moves over another.
- **Air resistance** is a type of friction force that pulls against an object travelling through the air. Some objects are more 'streamlined', meaning that the air pulls on them less, and they travel faster.
- **Water resistance** is the friction force on objects floating or moving in water.
- **Surface resistance** is the friction force of objects moving across a surface.

Balistic pathway of the ball



### Gravity

Gravity attracts all matter towards each other.

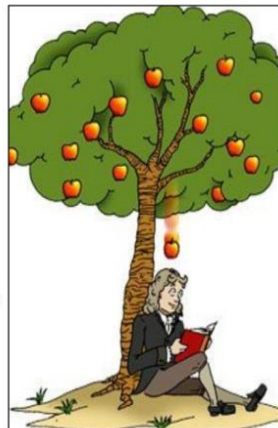
-It has been around since the beginning of the Universe, and applies to all matter in the Universe.

-The bigger an object's mass, the more gravity it will have. The smaller the mass of an object, the less gravity it will be subject to.

-Without gravity we would fly right off the planet! The moon's gravity causes our ocean tides on Earth. The Sun's gravity keeps Earth in orbit around the Sun.

-We don't actually "feel" gravity. We only feel the effects of trying to overcome it by jumping or when we fall.

-Sir Isaac Newton discovered gravity around 300 years ago. The tale is that he saw an apple fall from a tree, and wondered what force made it fall to the ground.

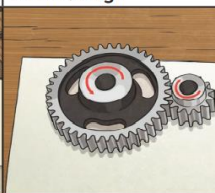


### Pulleys



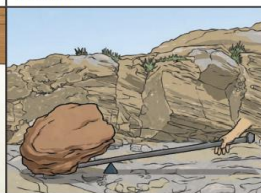
Pulleys can be used to make a small **force** lift a heavier load. The more wheels in a pulley, the less **force** is needed to lift a **weight**.

### Gears/Cogs



Gears or cogs can be used to change the speed, **force** or direction of a motion. When two gears are connected, they always turn in the opposite direction to each other.

### Levers



Levers can be used to make a small **force** lift a heavier load. A lever always rests on a pivot.