PICKHURST ACADEMY - SCIENCE KNOWLEDGE ORGANISER

Year:	5	Topic:	Earth and Space(The Earth and beyond)	Strand: Physics

What will I know by the end of the unit:

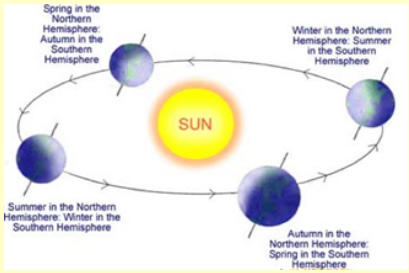
The Earth **rotates** on its **axis** anti-clockwise and makes a complete **rotation** over 24 hours (a day). This makes it appear as the Sun moves through the sky but the Earth's **rotation** causes day and night. Different parts of the Earth experience daylight at different times - this means that it is morning, afternoon and night in different places. This is also the reason why we have **time zones**. Because of the Earth's tilt, the poles experience 24 hours of sunlight in the summer, and very few hours of sunlight in the winter.

As the Earth **rotates**, **shadows** that are formed change in size and orientation.

The Sun, Earth and Moon are approximately **spherical**.

The Earth **orbits** the Sun.

The Moon **orbits** Earth.



- The Earth takes 365 and a quarter days to **orbit** the Sun.
- Because of the extra quarter day it takes to **orbit** the Sun, every four years on Earth is a **leap year**! It is the Earth's tilt that causes the seasons.
- The Moon **orbits** the Earth anticlockwise and takes approximately 28 days.
- The Moon spins once on its **axis** every time it **orbits** Earth. This means that we only see one side of the Moon.
- The Moon has different phases depending on where it is in its **orbit**.
- The Moon's **gravity** causes high and low tides.
- There are 8 planets in our Solar System (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune). Pluto is a dwarf **planet**.
- They all orbit the Sun, which is a **star**, and they all have moons.
- The first four **planets** are relatively small and rocky, while the four outer **planets** are gas giants (Jupiter and Saturn) or ice giants (Uranus and Neptune).
- There are also **asteroids**, **meteoroids** and **comets** in the **Solar System**.
- The **Solar System** is in a **galaxy** called the Milky Way.

  The **galaxy** is in the **universe**.

What might I know already:

We have four seasons (autumn, winter, spring and summer).
The Sun is a source of light but the Moon is not.
Know that a **shadow** is caused when an object blocks light from passing through it

Key vocabulary

asteroid	a rock that **orbits** the Sun in a belt between Mars and Jupiter
axis	an imaginary line through the middle of something
comet	a bright object with a long tail that travels around the Sun
galaxy	an extremely large group of stars and planets. Our galaxy is called the Milky Way.
gravity	the force which causes things to drop to the ground
leap year	a year which has 366 days. The extra day is the 29th February. There is a leap year every four years
meteorite	a rock from outer space that has landed on Earth
orbit	the curved path in space that is followed by an object going round and round a planet, moon, or star
planet	a large, round object in space that moves around a star
shadow	a dark shape on a surface that is made when something stands between a light and the surface
Solar System	the Sun and all the planets that go round it
sphere	an object that is round in shape like a ball
spin	turns quickly around a central point
star	a large ball of burning gas in space
time zones	one of the areas into which the world is divided where the time is calculated as being a particular number of hours behind or ahead of GMT (Greenwich Mean Time)
universe	the whole of space and all the stars, planets, and other forms of matter and energy in it

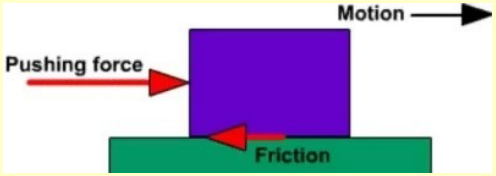
PICKHURST ACADEMY - SCIENCE KNOWLEDGE ORGANISER

Year:	5	Topic: Feel the Force(Forces)	Strand: Physics

What will I know by the end of the unit:

- **Forces** are pushes and pulls.
- These **forces** change the **motion** of an object.
- They will make it start to move or speed up, slow it down or even make it stop.
- For example, when a cyclist pushes down on the pedals of a bike, it begins to move. The harder
- the cyclist pedals, the faster the bike moves.
- When the cyclist pulls the brakes, the bike slows down and eventually stops.
- **Friction** is a **force** - it is the **resistance** of **motion** when one object rubs against another.

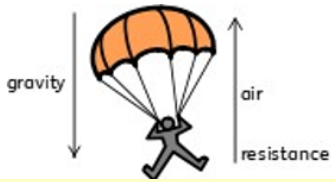
Other **forces** that create **resistance** of **motion** include **water resistance** and **air resistance.**



- Water **resistance** is the **friction** that is created between water and an object that is moving through it.

Some objects can move through water with less **resistance** if they are **streamlined.**

- **Gravity** is the **force** that pulls objects to the centre of the Earth.
- **Air resistance** pushes up on the parachute, **opposing** the force of **gravity** . This makes the parachute land more slowly.



What might I know already:

- Know what a **force** is and be able to explain that a push and pull are types of **forces.**That when **forces** are applied to an object they allow them to move or stop moving.The strength of the **force** determines how far and fast an object moves.**Friction** is the **resistance** of **motion** when there is contact between two **surfaces** The **force** that causes objects to move downwards towards the ground is **gravity**.That **magnets** have poles, and that opposite poles **attract**, while similar poles **repel.**

Key vocabulary

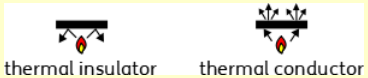
attract	If one object **attracts** another object, it causes the second object to move towards it
friction	the **resistance** of **motion** when one object rubs against another
force	the **pulling** or **pushing** effect that something has on something else
gear	a part of a machine that causes another part to move because of teeth which connect the two moving parts
gravity	the **force** which causes things to drop to the ground
lever	a basic tool used to lift or pry things open
motion	the activity of changing position or moving from one place to another
opposite	**Opposite** is used to describe things of the same kind which are completely different in a particular way. For example, north and south are **opposite** directions
pulley	a simple machine that makes lifting something easier. A pulley has a wheel or set of wheels with grooves that a rope or chain can be pulled over
repel	When a magnetic pole **repels** another magnetic pole, it gives out a **force** that pushes the other pole away
resistance	a **force** which slows down a moving object or vehicle
spring	a spiral of wire which returns to its original shape after it is pressed or pulled
streamlined	A **streamlined** vehicle, animal, or object has a shape that allows it to move quickly or efficiently through air or water
surface	the flat top part of something or the outside of it

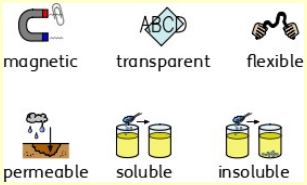
PICKHURST ACADEMY - SCIENCE KNOWLEDGE ORGANISER

Year:	5	Topic:	Get Sorted/Everyday Materials/Marvellous Mixtures/All Change (Properties and Changes of Materials)	Strand: Chemistry

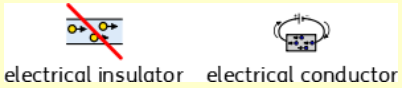
What will I know by the end of the unit:

- Materials which are good thermal conductors allow heat to move through them easily.
- Thermal conductors are used to make items that require heat to travel through them easily, such as a saucepan which requires heat to travel through to cook food.
- Thermal insulators do not let heat travel through them easily.
- Examples of thermal insulators include woolen clothes and flasks for hot drinks.

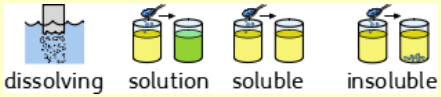




- Electrical conductors allow electricity to pass through them easily while electrical insulators do not.
- Electrical insulators have a high resistance which means that it is hard for electricity to pass through these objects.



- When the particles of a solid mix with the particles of a liquid, this is called dissolving.
- The result is a solution. Materials that dissolve are soluble.Materials that do not dissolve are insoluble.



- Some materials can be separated after they have been mixed based on their properties - this is called a reversible change.
- Some methods of separation include the use of a magnet, a filter (for insoluble materials), a sieve (based on the size of the solids) and evaporation.

When a mixture cannot be separated back into the original components, this is called an irreversible change. Examples of this include when materials burn or mixing bicarbonate of soda with vinegar.

What might I know already:

- A variety of everyday materials including wood, plastic, glass, metal, water and rock.
- The physical properties of a variety of everyday materials (including those that are transparent) and to compare and group materials on the basis of these properties
- How materials are suitably used based on their properties. How magnets and electrical circuits work. Some materials which are magnetic. How shapes of solid objects can be changed by squashing, bending, twisting and stretching. Materials that are solids, liquids and gases and their particle structure. Some materials change state when they are heated or cooled and the temperature at which this happens.
- The roles of melting, evaporation and condensation in the water cycle and the role temperature has on the rate of evaporation.Some rocks are permeable.

Key vocabulary

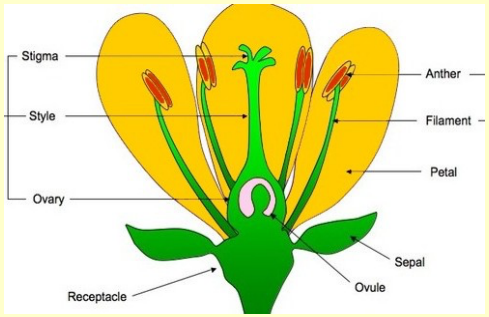
conductor	a substance that heat or electricity can pass through or along
dissolves	when a substance is mixed with a liquid and the substance disappears
evaporation	to turn from liquid into gas; pass away in the form of vapour.
filtering	a device used to remove dirt or other solids from liquids or gases. A filter can be made of paper, charcoal, or other material with tiny holes in it.
flexible	an object or material can be bent easily without breaking
gas	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.
insoluble	impossible to dissolve, esp. in a given liquid.
insulator	a non-conductor of electricity or heat
irreversible	impossible to reverse, turn back, or change.
liquid	in a form that flows easily and is neither a solid nor a gas.
melting	to change from a solid to a liquid state through heat or pressure
particles	a tiny amount or small piece
permeable	of a substance, being such that gas or liquid can pass through it
properties	he ways in which an object behaves
rate	the speed with which something happens
solid	having a firm shape or form that can be measured in length, width, and height; not like a liquid or a gas
soluble	able to be dissolved.
solution	a mixture that contains two or more substances combined evenly
temperature	a measure of how hot or cold something is
thermal	relating to or caused by heat or by changes in temperature
transparent	If an object is transparent, you can see through it

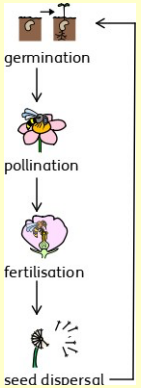
PICKHURST ACADEMY - SCIENCE KNOWLEDGE ORGANISER

Year:	5	Topic:	Reproduction in Plants and Animals (Animals including humans)	Strand: Biology

What will I know by the end of the unit:

- **Reproduction** is when an animal or plant produces one or more individuals similar to itself:
  - Sexual **reproduction**: requires two parents with **male and female gametes (cells)**
  - will produce **offspring** that is similar to but not identical to the parent
  - Asexual **reproduction**: will produce **offspring** that is identical to the parent requires only one parent





- Male **gametes** can be found in the **pollen.**
- Female **gametes** can be found in the **ovary** (they are called **ovules).**
- **Pollination** occurs when **pollen** from the **anther** is transferred to the **stigma** by bees and other insects.
- The **pollen** then travels down and meets the **ovule**. When this happens, **seeds** are formed - this is called **fertilisation**.
- **Seeds** are then **dispersed** so that **germination** can begin again.

Some **plants,** such as daffodils and potatoes, can also produce **offspring** using asexual **reproduction**

What might I know already:

- The processes of **dispersal, fertilisation** and **germination**
- **Reproduction** is one of the seven life processes.

Key vocabulary

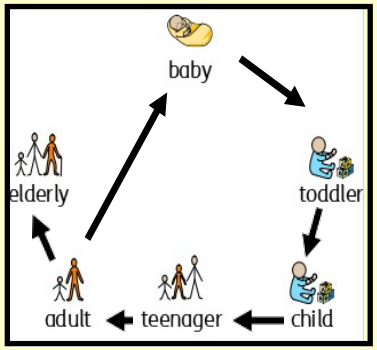
anther	the part of a **stamen** that produces and releases the **pollen**
bulb	a root shaped like an onion that grows into a **flower** or **plant**
cell	the smallest part of an animal or plant that is able to **function** independently
dispersed	scattered, separated, or spread through a large area
dissect	to carefully cut something up in order to examine it scientifically
fertilisation	male and female **gametes** meet to form an **embryo** or **seed**
flower	the part of a **plant** which is often brightly coloured and grows at the end of a **stem**
flowering	**trees** or **plants** which produce **flowers**
function	a useful thing that something does
germination	if a **seed germinates** or if it is **germinated**, it starts to grow
ovary	a female organ which produces eggs
ovule	a small egg
petal	thin coloured or white parts which form part of the **flower**
plant	a living thing that grows in the earth and has a **stem, leaves,** and **roots**
pollen	a fine powder produced by **flowers**. It **fertilises** other **flowers** of the same species so that they produce **seeds**
pollination	To **pollinate** a plant or tree means to **fertilise** it with **pollen.** This is often done by insects
reproduction	when an animal or plant produces one or more individuals similar to itself
seed	the small, hard part from which a new **plant** grows
stigma	the top of the centre part of a **flower** which takes in **pollen**
structure	the way in which something is built or made

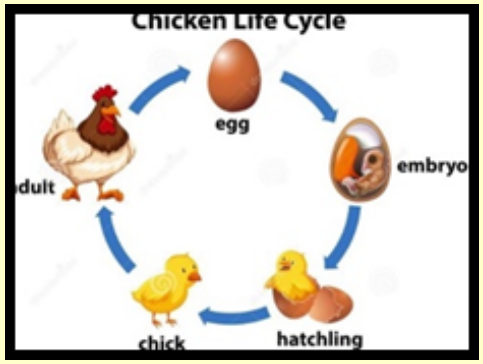
PICKHURST ACADEMY - SCIENCE KNOWLEDGE ORGANISER

Year:	5	Topic:	Circle of Things (Living Things)	Strand: Biology

What will I know by the end of the unit:

- The **life cycles** of mammals, birds, amphibians and insects have similarities and differences.
- One difference is that amphibians and insects go through the process of **metamorphosis.** This is when the structure of their bodies changes significantly as they grow (for example, from tadpole to frog or caterpillar to butterfly).





What might I know already:

Animals can be grouped into **vertebrates** (and then further into fish, reptiles, amphibians, birds and mammals) and **invertebrates**
Some examples of **life cycles** (including those of **plants** and humans)
Reproduction is one of the seven life processes.
The word **metamorphic** means 'a change of form' (in the context of rocks)

Key vocabulary

embryo	an unborn animal or human being in the very early stages of development
gamete	the name for the two types of male and female **cell** that join together to make a new creature
gestation	the length of a pregnancy
life cycle	the series of changes that an animal or **plant** passes through from the beginning of its life until its death
mature	When something **matures**, it is fully developed
metamorphosis	An abrupt and obvious change in the structure of an animal's body and their behaviour.
reproduction	The process of new living things being made.