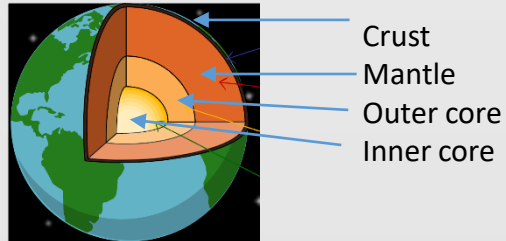




### 1) Structure of the Earth

Made up of a series of layer

- **Core** is very hot consisting of nickel and iron
- **Mantle** is the thick middle layer (~3000km)
- **Crust** is relatively thin (5-100km) and rocky



The crust and the outer mantle is called the **lithosphere**. The lithosphere consists of pieces of rock called tectonic plates that move about 2.5cm a year.

### 2) Volcanoes & Igneous rocks

Volcanoes form by tectonic plates moving near each other. Magma (molten rock) from below the ground is pushed to the surface, cools, solidifies & forms **igneous** rock.

Rocks formed within the ground are known as **intrusive igneous** rocks. They cool slowly & contain large crystals.

Rocks formed from lava outside the volcano are called **extrusive igneous** rocks. They cool quickly & contain small crystals.

Igneous rocks are tough rocks usually containing crystals, don't contain fossils and non-porous (won't let water through).

Common examples include granite, pumice, basalt and obsidian.

### 3) Sedimentary rock

Sedimentary rocks are formed by layers and layers of existing rock that has been broken down, called sediment, being squashed and squeezed together.

Sedimentary rocks often:

- are quite crumbly
- **contain fossils**.
- are porous (let water pass through easily).

Common examples include sandstone, limestone, chalk, shale & mudstone.

**Fossils** are the preserved remains of plants and animals whose bodies were buried in sediments.

Fossils form can form in three main ways:

- 1) When hard body parts are covered in sediments and then replaced by minerals.
- 2) Softer parts can leave impressions in sediments.
- 3) Dead organisms can be preserved in ice or amber.

### 4) Weathering

Rocks will slowly be worn away and break down over time and this is known as weathering.

There are 4 types of weathering:

- 1) **Freeze thaw** (water gets into cracks, expands on freezing)
- 2) **Onion skin** (Heating & cooling, causing expansion and contraction of different minerals in the rock)
- 3) **Chemical** (acid rain and other chemical break down the rock)
- 4) **Biological** (Plants in the form of tree roots, algae and comes bacteria break down rock).

### 5) Metamorphic rocks

Metamorphic rocks are formed by the effect of extreme **pressure and heat** underground.

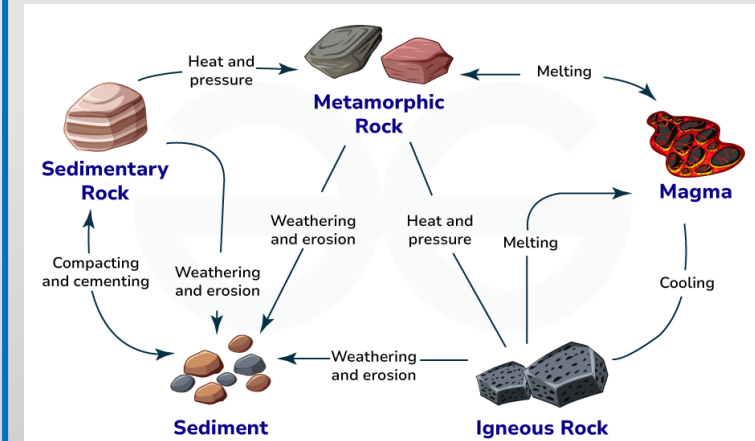
Metamorphic rocks are often:

- very hard
- shiny
- remains of fossils rarely present

Common examples include marble, slate, schist & gneiss

### 6) The Rock Cycle

Rocks break down and are recycled into new types of rock over millions of years and this is known as the rock cycle.





### 7) Space

The universe contains around **100 billion galaxies**.

Each galaxy can contain hundreds of billions of stars like our sun.

Planets can orbit stars and that is what makes our solar system.

### 8) Light Years

A light year is a measurement of distance in space.

A light year is the distance light travels in one year which is approx. 9.5 trillion kilometres ( $9.5 \times 10^{12}$ ) or 5.9 trillion miles ( $5.9 \times 10^{12}$ ).

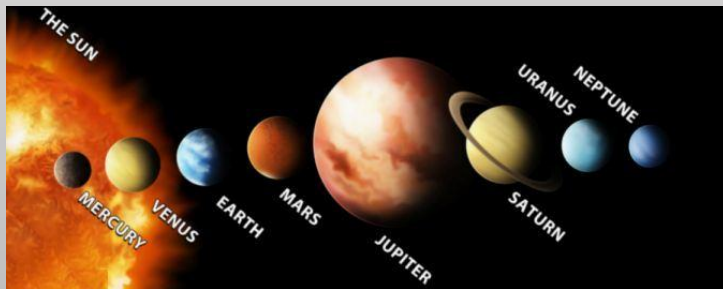
Light takes minutes to reach Earth from the Sun but four years from our nearest star.

### 9) Our Solar System

The solar system is made up of many objects, including; the sun, eight planets, meteors and three dwarf planets.

The eight planets in order from the sun are: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.

Pluto is now classed as a dwarf planet.



### 10) Night & Day

The Earth is constantly rotating on a tilted axis which causes night and day.

The Earth also orbits the sun which causes seasons. Seasons happen due to Earth being on a tilted axis.

When the northern hemisphere is pointed towards the sun it is Summer in the UK.

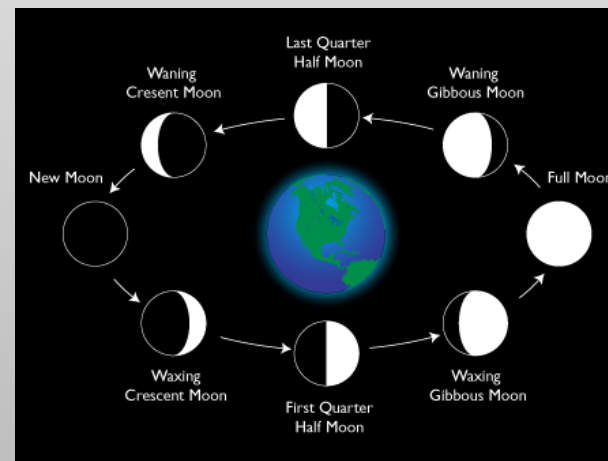
When the southern hemisphere is pointed towards the sun it is Winter.

### 11) Sun and the Moon

The Moon is Earth's natural (not man-made) satellite. A satellite is something that orbits a larger body.

The moon is held in orbit around the Earth by Earth's Gravity.

It does not produce its own light like stars do, it just reflects the sun's rays. This is why we can see it at night. It takes the moon 28 days to orbit the Earth. Over these 28 days the moon appears to change shape. This is because only half of the moon is facing the sun and we can't see the dark side.



### 12) Stars

Stars are giant balls of hot gas – **mostly hydrogen**, with some helium and small amounts of other elements.

They are held together by **gravity**.

The nearest star to us is the sun.

The sun, and other stars, are luminous objects.

### 13) Beyond our solar System

A galaxy is a collection of hundreds of billions of stars orbiting around a supermassive black hole at the centre.

Our galaxy is called the Milky Way and contains around 300 billion stars just like the Sun.

- A year length is the length of time to orbit the sun
- A galaxy is a collection of stars held together by gravity.
- Our galaxy is called the Milky Way.
- A light year is the distance light travels in a year (over 9 million, million kilometres).
- A stars is a body which give out light, and which may have a solar system of planets.
- An orbit is the path taken by a satellite, planet or star moving around a larger body.

### Space key words

Galaxy, orbit, light year, stars, exoplanet, solar system, seasons