

**Circular Orbits (HT Only)**

An orbit is the circular path an object takes as it moves around another object e.g. a planet around the Sun. An object is kept in orbit by the balance between 2 forces:

1. The force of gravity pulling it towards the object it is orbiting.
2. The forward motion of the object

An objects speed is also determined by its orbit:

* If an objects speed increases, its orbit must decrease.
* If an objects speed decreases, its orbit must increase

***Main Sequence Stars***

Our Sun is a main sequence star.

A main sequence star is in a state of ***equilibrium***:

The energy released outwards by the nuclear fusion is balanced by the force of gravity which is pulling everything inwards.

A main sequence star is in a stable period of its life.

Red-shift is used as a source of evidence to support the idea that the universe is expanding.

Light from distant galaxies has an increased wavelength.

This means that they are ‘shifted’ towards the red end of the spectrum, this is why the effect is known as ‘***red-shift***’.



**The Big Bang Theory**

1. All matter in the universe occupied a very small, dense space.

2. There was an explosion and it has been expanding ever since.

**Red Shift**

Our solar systems contains 1 star… the Sun.

The Sun is orbited by the following objects:

* ***Planets*** – large objects that have cleared their orbital paths. There are 8 in our solar system.
* ***Dwarf Planets*** – These are small planet like objects that do not meet all of the criteria for being called a planet.
* ***Moons*** – natural satellites that orbit the planets.

Our solar system is part of a galaxy called the Milky Way.

Stars are formed from clouds of dust and gas called ***nebula***.

Gravity causes the dust & gas to come together, eventually forming a ***protostar***.

Density increases leading to a temperature increase.

The increased temperature causes hydrogen nuclei to undergo ***nuclear fusion*** to become helium nuclei.

This emits a lot of energy and a star is formed!

**The Universe**

The universe is ***expanding*** rapidly.

Red-shift provides evidence to support this theory.

The galxies that are furthest away from us and moving away from us the quickest.

The balloon in the image below is used to model the expanding universe, as the balloon inflates the galaxies move away from each other

**PU8: Space Physics**

**Stars**

**The Solar System**