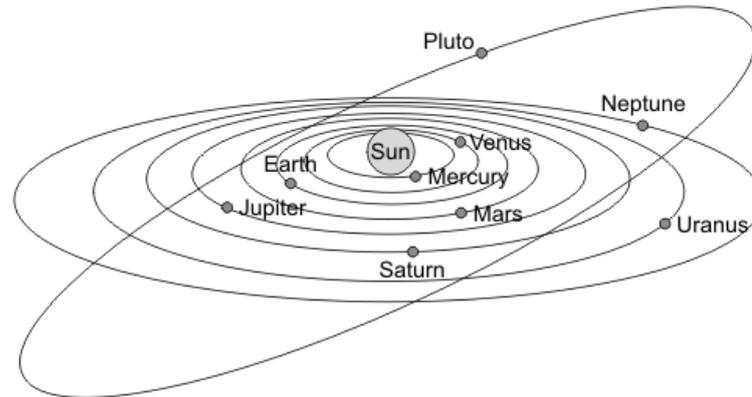


## Year 8: Space and Forces

- Every object exerts a gravitational force on every other object. The force increases with mass and decreases with distance. Gravity holds planets and moons in orbit around larger bodies.



- Mass and weight are different but related. Mass is a property of the object; weight depends upon mass but also on gravitational field strength.
- If the overall, resultant force on an object is non-zero, its motion changes and it slows down, speeds up or changes direction.
- When the resultant force on an object is zero, it is in equilibrium and does not move, or remains at constant speed in a straight line.
- The solar system can be modelled as planets rotating on tilted axes while orbiting the Sun, moons orbiting planets and sunlight spreading out and being reflected. This explains day and year length, seasons and the visibility of objects from Earth.
- Our solar system is a tiny part of a galaxy, one of many billions in the Universe. Light takes minutes to reach Earth from the Sun, four years from our nearest star and billions of years from other galaxies.

### Keywords

**Average speed:** the overall distance travelled divided by overall time for a journey.

**Contact force:** one that acts by direct contact.

**Field:** the area where other objects feel a gravitational force.

**Friction:** force opposing motion which is caused by the interaction of surfaces moving over one another. It is called 'drag' if one is a fluid.

**Galaxy:** collection of stars held together by gravity. Our galaxy is called the Milky Way.

**Light year:** the distance light travels in a year (over 9 million, million kilometres).

**Mass:** the amount of stuff in an object (kg).

**Newton:** unit for measuring forces (N).

**Non-contact force:** one that acts without direct contact.

**Orbit:** path taken by a satellite, planet or star moving around a larger body. Earth completes one orbit of the Sun every year.

**Pressure:** the ratio of force to surface area, in  $N/m^2$ , and how it causes stresses in solids.

**Speed:** how much distance is covered in how much time.

**Stars:** bodies which give out light, and which may have a solar system of planets.

**Upthrust:** the upward force that a liquid or gas exerts on a body floating in it.

**Weight:** the force of gravity on an object (N).