

AMAZING EARTH: Our Home in the Universe

Earth is a third planet from the sun. It is part of the Solar System. The Solar System consists of the Sun and astronomical objects gravitationally bound in orbit around it. These objects are planets (like the Earth), comets (like Haley comet) and asteroids (located mostly between Mars and Jupiter). The Earth is just floating in space and moves around the Sun. It takes the Earth 365 days (1 year) to go around the Sun.

Earth is the largest of the terrestrial planets in the Solar System. A terrestrial planet is rocky and hard. There are 4 rocky planets in the Solar System which are Mercury, Venus, Earth, and Mars. Earth is the largest rocky planet. The other types of planets in the Solar System are the 'gas giants', which are Jupiter, Saturn, Uranus, and Neptune. These planets are neither hard nor rocky, but are full of gasses, like a balloon.

The body of the Earth can be divided into 3 main sections. The sections are the crust, the mantle and the core. We live on the Earth's crust. The Earth produces its own heat like the Sun, which mostly comes from the core. The core is very hot, so hot that it melts metals. The Earth also has a layer of gas which surrounds it called the atmosphere.

The atmosphere protects life on Earth by absorbing ultraviolet solar radiation, warming the surface by keeping heat inside, and reduces temperature extremes between day and night. In other words, the atmosphere keeps the Earth the way we know and feel it every day. On rainy days the atmosphere is cold and humid. On sunny days, the atmosphere is dry and hot. The atmosphere keeps us alive and is made of what we call air.

Air is what we call the atmosphere used in breathing for animals and photosynthesis for plants. Dry air contains roughly (by volume) 78.1% nitrogen, 21.0% oxygen, 0.9% argon, 0.04% carbon dioxide and small amounts of other gases. Air also contains different amounts of water vapour. The air is also responsible for air pressure, like the air in the tyres of our car.

The average air pressure at sea level is about 1 atmosphere (atm) = 101.3 kPa (kilopascals) or the total weight of the air above a unit area at the point where the pressure is measured. Air is also inside our bodies and exerts pressure from inside our bodies. Light that passes through our atmosphere causes the light to scatter. A phenomenon called Rayleigh scattering result in shorter (blue colour) wavelengths scattering more easily than longer (red colour) wavelengths. This is the reason why the sky looks blue because you are seeing scattered blue light. This is also why the sunset is red. Light scattering is also the reason why the sea is blue.

Earth is also special since it contains liquid water. More than 70% of the Earth's surface, an area of some 361 million square kilometres, is covered by ocean. That is almost 1100 times the size of Malaysia. Since there is so much water on its surface, the Earth is also known as the Blue Planet. The Ocean is also salty. The average salinity of the Earth's oceans is about 3.5% or if you were to take 1 kilogram of water and boil it until no water is left, you will be left with 35 grams of salt. The rest of the planet surface (25%) is made of the land which we walk and play on.

The Earth's surface which is not covered by water consists of mountains, deserts, plains, plateaus and other types of surfaces. A desert is one extreme of the Earth's surface where there is very little water. Plains are flat surfaces, and plateaus are flat surfaces on high land. These types of land are located in areas with different climates.

Climate is made up of and measured by temperature, humidity, atmospheric pressure, wind, precipitation (rain fall) and others. So a type of climate can be defined using the above measurements. There are many ways to divide the climates of the Earth. Some of the types of climate include rain forest, monsoon, tropical savanna, Mediterranean climate, tundra, polar ice

cap, desert and others. Malaysia has the rainforest climate where tigers live. The lions in Africa live mostly in areas called tropical savanna. As we can see, different types of animals live in different types of climates. The ability of animals to live in different climates depends on their ability to adapt to their environment.

Earth is a unique and special planet in the Universe. It is the only known living planet. Life began on Earth about 3.5 billion years ago. That is a not very long time ago. Life evolved in stages, starting with single cells to multiple cell organisms. Life forms can therefore be divided into the broad classes of plants and animals, which can then be further sub-divided. The discipline of biological classification is called taxonomy where the term 'species' refers to one of its basic units, each having a classification name. Humans like you and me belong to the "Homo Sapiens" species. "Homo" in Latin language means 'man' and "sapiens" means "wise". So we are the "wise men" species. There are so many types of animals on Earth mostly because Earth has oxygen which most living beings breath.

In the year 1774, a scientist named Lavoisier did experiments on oxidation and gave the first correct explanation of how combustion works. Combustion is the process when a piece of wood is burning. He found that combustion needs oxygen. Combustion produces energy. Animals use the same process to produce energy inside their body which enables them to do work like walk and run. To produce energy, we burn food in our body which needs oxygen. So oxygen has become the gas which allows us to produce energy to do things. Oxygen makes Earth special and able to support life. Oxygen is produced by plants using a process called photosynthesis.

Photosynthesis is a process which plants use to turn carbon dioxide and water into oxygen and food such as rice and vegetables. We eat the rice to produce carbon dioxide and energy. So living beings like us are part of the Earth's way to maintain the planet's climate. So it is important for you and me to play a role to keep our mother Earth a living planet. Earth is a beautiful planet. Earth is our mother. Earth is our home. Let us together love and take care of her so that she can take care of us. Her wellbeing is our wellbeing.