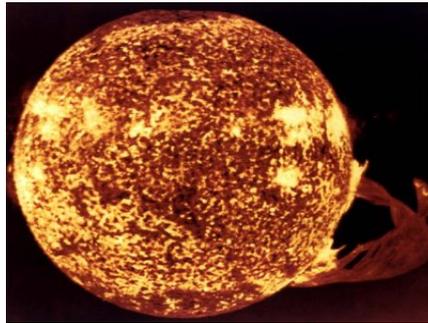


The Sun



The sun is just a star, just like many of the stars we see twinkling in the night sky. Though the sun appears quite large to us, many of the other stars are much bigger - they are just farther away.

The sun was born 5000 million years ago from a cloud of hydrogen and helium mixed with dust. It is made of hot gases, containing many of the materials that we find here on earth. The sun is enormous. Even though it looks small, it is 93 million miles away (or 150 million km) The sun is so far away that if you drove a car at about 60 miles (or 80 km) an hour, it would take you 176 years to get there! The sun will last for about another 5 billion years. After that it will exhaust its hydrogen and will enter a new phase of existence, burn its helium and expand to about 100 times its present size and become what is known as a red giant. After this it will run out of helium and collapse into a much smaller object called a red dwarf.

Huge explosions on the sun's surface are called solar flares, such as the one in the photo.

Electronic devices called solar cells produce power for satellites and houses. In 1987, the solar powered 'Sunrayer Car' drove across Australia at 66.9 km/hour (41.6 mph)

Sun Facts

- The sun's temperature on the outside is 10,000 degrees Fahrenheit.
- The sun's temperature at the centre is 27,000,000 degrees Fahrenheit.

Lightning



A lightning flash can happen in half a second. In that instant, the lightning flash heats the surrounding air to 33,000 degrees celcius - five times hotter than the surface of the sun - and produces about 100 million volts of electricity! The intense heat causes thunder.

Lightning is a big spark of electricity caused by a build-up of electric charge in clouds. The spark passes between clouds or from the cloud to the ground.

In 1752, the famous scientist William Franklin conducted an experiment to find out if lightning was electricity. He flew a homemade kite, with a wire attached to it, into a rain cloud. Franklin expected the lightning to strike the wire, and flow down the kite string to a key tied near the end. If all worked, he expected to get a spark when the key was touched. It worked, and Franklin had been very lucky. Had the lightning strike been any stronger, he could have been badly hurt or killed. After this and other experiments, Franklin invented lightning rods to protect buildings from lightning strikes.

Facts

- The word 'electricity' comes from the Greek word for amber.
- The ancient Greeks noticed that when amber was rubbed with cloth, small objects would cling to it.

Bioluminescence



Bioluminescence is the ability of living things to give off a glow or a light. Light comes from the tissue of the animal and is made by chemicals mixing inside their bodies - but the light does not give off heat. Most, though not all of these animals live in the sea and the colours can be red, orange, yellow, green, blue or violet - the colour of bioluminescence most often found in the sea is blue. Though sardines do not give off light themselves - as they move, they disturb tiny organisms which produce light. Indeed, in some parts of the sea, bioluminescent creatures are so abundant, that any disturbances can produce a shimmering light shadow. Therefore, sardine fishing is done on dark nights with no moon.

The organs of the Lantern Fish give off light. There are about 1000 kinds of lantern fish in the world. They use their light to communicate and to attract their prey. The light also gives the fish a kind of camouflage. The fish are invisible from below because the light on their bodies reacts to light from the moon or sun.

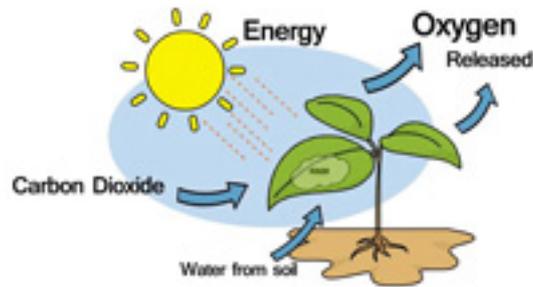
Bioluminescence has the overall effect of allowing the sea to almost glow! When waves crash against the shore, bands of luminescence - like the neon tubes of fluorescent lights - light up spectacularly. During the war, undercover work in darkness was made much more difficult when on the sea and there was bioluminescence in the area!

The following animals also glow: Decapod shrimp, Bristle mouth Fish, Krill, and Gelatinous Zooplankton.

PHOTOSYNTHESIS

Photosynthesis is a food-making process in plants. The word means "putting together with light".

The main function of leaves is to make food for the plant through a process called photosynthesis. Leaves are really like small factories - different parts of the leaf having a different job.



Green plants use energy from the sun to mix water and carbon dioxide to make sugar and other chemicals. Leaves are green because they contain small bodies called chloroplasts and these chloroplasts contain a pigment called chlorophyll. This green material gives the leaf its colour. When all the light and minerals and carbon dioxide has been absorbed, it can be made into starch, fat, vitamins and sugars that the plant needs to live. The food that we eat comes from this sugar.

The sugar is mixed with water and sent to other parts of the plant as food. Oxygen is released into the air through stomata - small holes in the underside of the leaves.