

Earth and space

Eesa IV

The solar system, the sun and the 8 planets

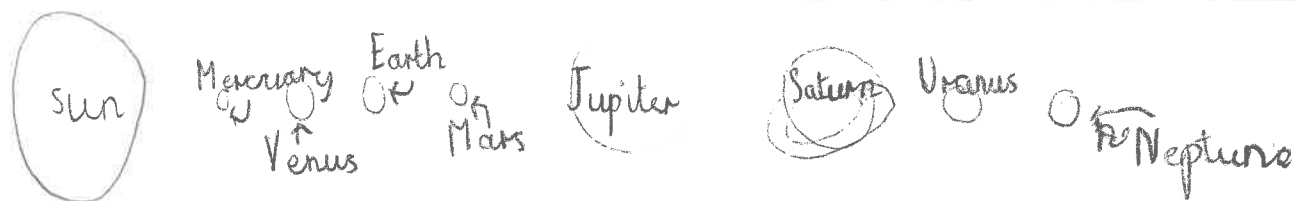
The solar system ~~was~~^{is} a network of eight planets and 1 star. It was formed by a huge cloud of dust which happened approximately 10 billion ^{years ago}. The star (sun) was formed 6.7 billion years ago. Due to the sun's gravitational pull, 8 planets formed as which are known as Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Jupiter and Saturn are sometimes known as gas giants due to the fact that they are largely made out of hydrogen and helium. They do not have a solid surface because they ~~it~~ are not made of rock or other hard minerals. Neptune and Uranus are sometimes known as ice giants because they contain large amounts of icy water, methane and ammonia. These 2 planets are the furthest away from the sun within our solar system. There are five dwarf planets known in the solar system which are Pluto, Ceres, Makemake, Eris and Haumea. These planets are large enough to have their own ~~star~~ gravity.

How hot is Mercury?

In the day, temperatures soar to 400°C however at night they plunge to -175°C .

How fast does Jupiter spin?

Despite its huge size, Jupiter's surface moves at 45,000 kilometers per hour.



Stars and Galaxies

A galaxy is a system of stars, gas and dust held together by gravity. There are billions of galaxies throughout space. Sometimes they merge or collide with each other.

Our galaxy is called the Milky Way. Since our own galaxy was the first one that astronomers knew about, they came up with the word galaxy, which comes from the ^{Greek} word for Milky.

Stars are dying and being born all the time.

Big, bright stars live for only 10 million years.

Medium sized stars like our sun live for 10 billion years.

The surface temperature of the coolest stars is below $3,500^{\circ}\text{C}$ however the hottest stars are over $40,000^{\circ}\text{C}$.

When a star has used up all its energy, it either blows up, shrinks, goes cold or becomes a black hole.

Elements

An element is a substance which cannot be split into other substances. Water is not an element because it can be split into the gases oxygen and hydrogen.

What is ...

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... A molecule?

A molecule is the smallest part of a substance that can exist on its own.

... A proton?

... A neutron?

A particle inside an atom's nucleus. It has a positive electric charge.

... An electron?

Another kind of particle inside the nucleus. It has no electric charge.

... An electron shell?

Negatively electrically charged particles inside a nucleus.

... Atomic number?

Electrons are stacked around the nucleus at different levels.

... Atomic mass?

Every element has its own atomic number. This is the number of protons in its nucleus, balanced by the same number of electrons.

... The Periodic table?

Atomic mass is the weight of one whole atom of a substance. It includes both protons and neutrons.

Elements can be ordered into a chart called the periodic table. Columns are called groups and rows are called periods.

Fun facts

The lightest element is hydrogen. It has an atomic mass of just one.

There are 118 elements identified.

The largest element is ~~un~~ununoctium.

Properties and changes in materials.

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What are substances?

Substances can be solids, liquids or gases. Substances move from one state of matter to another when they are heated or cooled.

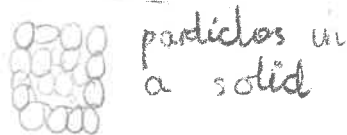
What are liquids?

In liquids, particles move around a bit so liquids can flow into any shape, while their volume stay the same.



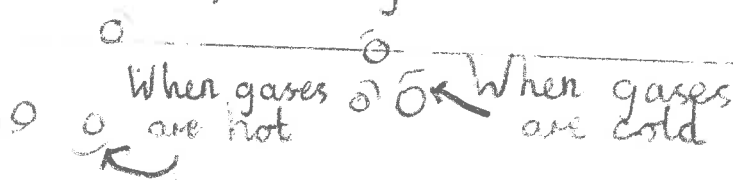
What are solids?

In solids, particles are locked together so solids keep the same shape and volume.



What are gases?

In gases, particles zoom about all over the place, so gases spread out to fill containers of any size and shape.



What is plasma? Essa. N

Plasma is the fourth state of matter. It occurs only when a gas becomes so hot that its atoms and molecules collide and electrons are ripped free. Plasma emits light. Due to this, it is used in many television screens.

Ecosystems

An ecosystem is a community of plants and animals that live in the same area or environment. The world has many different ecosystems, each with its own climate, soil and living things. Some ecosystems are small—such as ponds and coral reefs. Other ecosystems including forests and deserts, are much larger. Many ecosystems need to be protected because growing human populations are putting them under threat.

What is a desert?

A desert is an area that receives very little rain and so is unable to support much plant growth. Although many deserts are in hot regions, some of the world's deserts can be extremely cold.

Which is the hottest desert?

Parts of the Saharan North Africa and the Mojave Desert in North America, experience very high temperatures. The average summer temperature may be over 40° . In the Death Valley of the Mojave Desert, temperatures of 57°C have been recorded.

Which is ^{the} largest desert?

The Sahara in North Africa covers an area of about 9,400,000 square kilometers. This is nearly as big as the United States of America.

What is a grassland?

Grassland develops in temperate regions, lying between the polar areas and the tropics, that have warm summer and cold winters, and where there is not enough rainfall for trees to grow.

What is a wetland?

Wetlands include swamps, bogs and marshes. Wetland plants are adapted to live in water-soaked soil. Bulrushes, water lilies and mangroves are some of the common wetland species.

Plants

How many kinds of plants are there?

There are approximately 287,655 named ^{species} of plants, although many more are believed to exist. These range from trees, bushes and herbs to grasses, ferns and mosses. Most plants get their energy for growing from sunlight, using a process called photosynthesis.

Why are most plants green?

Because their leaves and stems contain the green pigment chlorophyll.

Why do roots grow downwards?

Roots respond to gravity by releasing chemicals that prevent growth on the lower side, thus turning the root downwards.

Plant reproduction

Many plants reproduce by pollination. The pollen, containing the male cells, fertilizes the female ovules, which then produce seeds. The pollen can be taken to its destination by insects, birds, the wind or water.

How are flowers pollinated?

The animal on the flower gets showered in pollen, then moves to another flower transporting the pollen.

What happens in a flower after pollination?

Pollen that has landed on the stigma of a flower sends a tube down into the ovary, which it enters to fertilize an ovule. Each ovule becomes a seed.

Can plants reproduce without seeds?

Some plants spread by dispersing seeds spores, which can reproduce a new plant without the need of pollination. Other plants send out runners or split off from bulbs, or swollen stems.