

THE SUN

The Sun is the only **star** in the Solar System and the nearest one to Earth. Like all stars, it is an enormous **ball of burning, scorching hot gas**. It seems to be a fiery monster, but the Sun is what makes life on the Earth possible.

The Sun began to form about **4.6 billion years** ago when a swirling cloud of dust and gas called the *accretion* disk started collapsing. About 1 % of leftovers began forming solid lumps which collided with others to form bigger lumps until they eventually became **protoplanets**. These took millions of years to cool down and form the eight planets we know today.

The Sun is a pretty average star. Many of the stars are much bigger than the Sun, but they are so far away that they look tiny. Our star **has enormous gravity**, 30 times stronger than on the Earth. That gravity keeps all the planets in the Sun's orbit. Average it may be compared to other stars, but the Sun is huge! The Earth is tiny in comparison. If the Sun were a basketball, the Earth would be the size of a pinhead.

The Sun is 3000,000 times heavier than the Earth: if it was possible to clump all the planets together, the Sun's mass would still be 750 times larger.

It is also a very long **away** – **150 million km**. If you placed your basketball Sun on the goal line of a football pitch, The pinhead Earth would be 30.5 metres away. If a person had started walking to the Sun 650 years before the birth of Jesus, he would be arriving just about now. Even the **light** from the Sun travelling at 299,792,458 metres per second takes **8.3 minutes** to reach us.

The surface temperature is **5500 °C**. But that's nothing compared to the temperature in the middle: about **15.6 million °C!!** Its energy is created when hydrogen atoms fuse to make helium. This is called **nuclear fusion**. The Sun 'uses up' 4 million tons of hydrogen every second to produce an estimated 386 billion, billion megawatts. That's the same amount of energy in 15 minutes that everyone on the Earth uses all year.

The centre of the Sun is like a giant bomb that never stops exploding. At the surface, gas leaps up in bright bursts called **solar flares**. They are caused by changes in the Sun's magnetic field. Often, these blasts of really hot gas arch up high above the surface to form **solar prominences** – great big, fiery loops.

All the gas in the Sun spins around its axis but between the poles and the equator the gas travels at different speeds with amazing results: over a period of 22 years the Sun's magnetic poles actually swap places. The star shows the most sun spots while the **poles are changing**.

The Sun is about 4.5 billion years old; it is middle aged, nearly halfway through its life, and will burn its hydrogen until it runs out in about 5 billion years.

Sometimes the Moon passes between Earth and the Sun, blocking some or all of the sunlight. We call it **partial** or **total eclipse**. When it blocks all of the Sun it is called total eclipse. During a total eclipse the outer atmosphere of the Sun, or **corona**, becomes visible. A total eclipse of the Sun is only visible from the same spot of the Earth every 360 years, but happens somewhere on the Earth about once a year. Across the centuries, it has been considered as an evil or a bad omen :) On 28 May 5858 BC a solar eclipse actually ended a five-year war between two ancient Middle Eastern nations. The Lydians and the Medes were so amazed but what they saw that they immediately agreed a peace treaty.

TASKS

1. Why would it be impossible to land on the Sun? Present at least 3 reasons. max 15p.
2. Why is it dangerous to look directly into the Sun? max 5p.
3. How much would you weigh on the Sun? max 5p.
4. What is "corona" of the Sun? max 5p.
5. Draw two pictures presenting partial and total eclipse. max 10p.
6. What would happen if the Sun suddenly vanished? What about our solar system?
What about the Earth? How long wouldn't it go dark and cold on our planet? max 20p.

Vocabulary

average – przeciętny

axis – oś

collapse – zapadać się

considered – uważany za

eclipse – zaćmienie

equator – równik

fusion – połączenie

gravity – grawitacja

in comparison – w porównaniu

leftovers – resztki

loop – pętla

lumps – kawałki, grudy

nuclear fusion – reakcja jądrowa

partial - częściowe

period – okres

pinhead – łepka od szpilki

pole – biegun

run out – skończyć się, wyczerpać

solar flares – wybuchy na słońcu

swap – zamiana

swirl - wirować