The sun’s stormy surface

The moving electrons in the plasma of the sun create electricity, and this generates very powerful magnetic fields. When these reach the surface, huge jets or loops of hot gas called prominences erupt into space. They can reach up to 400 000 km (more than 20 Earth diameters) above the sun’s surface.

Dark, relatively cool patches on the sun’s surface are called sunspots. These may be larger than the Earth. They form in pairs or groups, and occur where the magnetic field leaves and rejoins the surface. Rapid eruptions called solar flares also occur near sunspots. Solar flares release huge amounts of radiation. They also release charged particles such as electrons and protons travelling at about 450 km/s. It has been estimated that more than a million tonnes of this material is released every second in what is called the solar wind.

Sunspot activity reaches a maximum (called a solar storm) about every 11 years. These solar storms affect the weather on Earth, and cause beautiful flickering patches of light in the sky near the Earth’s poles. These are called auroras. The solar wind can also cause massive interference to radio communications on Earth. It can also cause power surges and blackouts. Our atmosphere protects us from the solar wind, but astronauts in space need to be shielded from it.

Around the sun is an atmosphere of hot gas called the corona. It is very hot (about 1 000 000°C) and extends millions of kilometres into space. It is invisible from Earth, and can only be seen when the moon blocks out the bright disc of the sun during a solar eclipse.

**Over to you**

1. The sun is a star and the Earth is a planet. What is the difference between them?
2. A space vehicle sent from Earth could never reach the surface of the sun. Why not?
3. a. Which two elements make up most of the sun?  
   b. What is the state of the matter in the sun’s core?
4. How is it that the sun can go on producing such huge amounts of energy? Will it go on forever?
5. a. What is the solar wind?  
   b. How does it affect the Earth?
6. Why are solar prominences and the sun’s corona easier to see when there is an eclipse of the sun?