DR. SEAHORSE SEEKS SPOTS

BRIEF DESCRIPTION

Today Dr. Seahorse examines the freckles of the sun. Freckles? Well, they're really called 'sunspots'. Take a look!

KEYWORDS

- Sun
- Sunspot
- Temperature
- Degrees Celsius

MATERIALS

A pair of binoculars (on a tripod, if you have it!)
A sheet of white paper
A sunny day

LEARNING OBJECTIVES

Primarily, students will learn about the existence of sunspots. They will also learn about the importance of safety when observing the Sun using the naked eye or instruments.

BACKGROUND INFORMATION
The dark spots that can sometimes be seen on the surface of the Sun are called ‘sunspots’. They are created by the magnetic fields of the sun, and are much larger than you might think. They are often bigger than the Earth! Sunspots look dark because they are slightly cooler than the rest of the Sun’s surface: they are only 3,500°C. That is obviously really hot, but it’s compared to the rest of the Sun, which is almost 6,000°C, it seems rather cool!

The Sun is a ball of extremely hot gas that constantly shifts and flows. The gas in the interior of the Sun moves separately from that closer to the surface and at different rates. The outer gas at the equator of the Sun also moves faster than at the solar poles. All of this uneven movement causes the Sun's magnetic fields to become distorted and twisted, similar to they way your sheets get all bunched up and wrinkled if you move around a lot while you sleep. The twisted magnetic fields have so much power in them that they're able to block the hot gas from rising to the Sun's surface, resulting in a sunspot.

Sunspots can last from one hour to several months, but they are not permanent. The number of sunspots increases and decreases over an eleven-year cycle called the solar cycle.

**FULL ACTIVITY DESCRIPTION**

We are going to use the binoculars in an unusual way. We will not look through them ourselves, but use them as a projector.

**Beware**: Never look directly at the sun! Not with the naked eye and certainly not through the binoculars! Do this experiment with the help of an adult.

Now, let’s get to work!

**Step 1**

Look at the binoculars. Do you see they have two sides? The narrow side is used to look through and is called the ‘eyepiece’. The wider side is called the ‘objective’. The ring around the eyepiece can be turned to focus the binoculars and make the image clearer.

**Step 2**

Aim the binoculars with the thick side pointed towards the sun. (Use your instincts - **Do Not** look through the binoculars at this point!)

**Step 3**
Ask an adult to hold the sheet of white paper approximately one metre behind the narrow side of the binoculars.

**Step 4**

Aim the binoculars so that the sunlight falls through them onto the paper. You have now made a picture of the Sun — a so-called ‘projection’! If the picture is not sharp enough, use the focus-ring on the eyepiece to adjust the focus or ask the adult to hold the paper a little bit farther or closer. Do you see anything special in the projection?

**SOURCE**

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