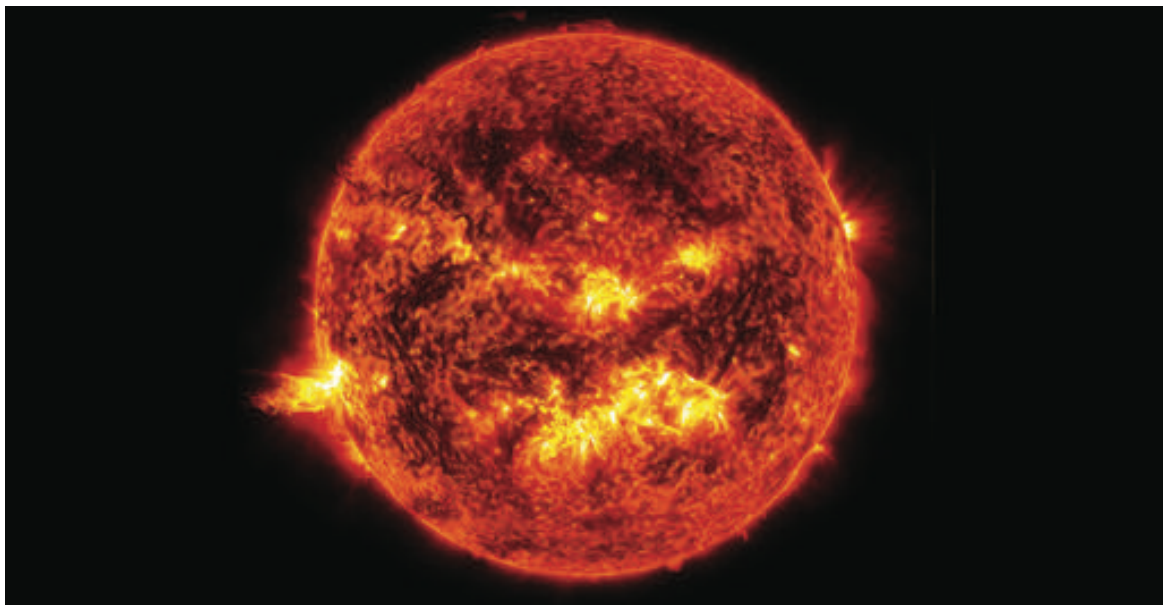


Age
5-11
years

Phizzi practical

Safely observing the Sun



Credit: NASA/SDO

Introduction

When learning about seasonal change, and the Earth and space, children will be curious about our nearest star, the Sun. If you are talking about the Sun with your pupils, your first concern should be eye safety. Serious eye damage can result from the briefest glimpse of our nearest star and this guide aims to explore safe ways that children can make observations of the Sun.

Scientific explanation

The Sun is our nearest star, it is a 4.5-billion-years-old hot glowing ball of hydrogen and helium, the centre of which reaches temperatures of 15 million °C. It is important to not look directly at the Sun with the naked eye as the lens in our eye is about four times as powerful as a magnifying glass and will focus the sunlight to a point on the retina which could burn a hole in the light sensitive cells at the back of the eye and cause permanent damage. This effect could be even worse if observations are made through unfiltered cameras, telescopes or binoculars as these will all focus the sun's rays more than your eyes do. One way to support your pupils in making safe observations of the Sun is to make a simple pinole camera.



Looking directly at the Sun, even when it is partially covered by the moon, can cause serious eye damage or blindness.



Pinhole cameras for younger children

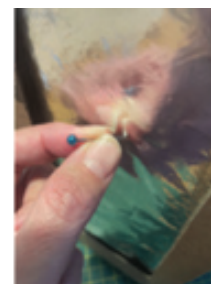
As young children often have difficulty keeping one eye closed when making observations and may not follow instructions with regard to not looking directly at the Sun, a large pinhole camera can help to reduce risks. It is anticipated that this pinhole camera is made by the teacher for young children to use.

Equipment needed

- Large cardboard box
- Craft knife
- Cutting board
- Scissors
- Pencil
- Sticky tape
- Aluminium foil
- Greaseproof/tracing (translucent) paper

Method

1. Cut the large box in half horizontally so that it is in two sections, an upper and lower section. Cut the upper section in half so that it fits snugly inside the lower section.
2. On the closed end of the upper section, draw a rectangular window and cut it out with a craft knife on a cutting board.
3. Cover the window with translucent paper, taping it smoothly into place to create a screen in the middle of the box.
4. Cut a similar window in the end of the lower section and cover this with foil, using a pin to place a tiny hole in the centre for sunlight to enter.
5. When the two sections are now taped together, children will be able to put their head inside the box to safely view a projected image of the sun on the screen in the centre of the box.



Pinhole cameras for older children

When you have carried out a risk assessment for your class and you are confident that the children will be able follow safety instructions with regard to looking at the Sun directly, you could make these individual pinhole cameras.

Equipment needed

- Tracing paper
- 2 cardboard tubes
- Rubber bands
- Scissors
- Foil
- Pin

Method

1. Take one cardboard tube and cut it down the long side, then push one side under the other so the tube is narrow enough to slide inside the other.
2. Wrap a rubber band around the cut tube to help keep its shape and prevent it from getting stuck inside the larger tube.
3. Separate the tubes and tape a piece of tracing paper securely and smoothly over the end of the smaller tube.
4. Tape a piece of foil over the end of the larger tube, again ensuring it is smooth. Use the pin to place a tiny hole in the centre of the foil.
5. Insert the narrow tube back into the larger one, with the end covered in tracing paper first so that the paper and foil are in the same direction.
6. Now when you look in the open end of the tubes you will view an image of the Sun projected onto the tracing paper or viewing screen. Children can point their device directly at the Sun and observe the image of the Sun on the viewing screen with one eye while keeping the other eye totally closed. Note that the image of the Sun will always be upside down.

Working scientifically

Children can make observations over time of the Sun by focusing on the shadows formed by sunlight when it falls on an object. The direction and size of shadows tell children about the position of the Sun in the sky. Children should never look at the sun directly. Risk assessments are the responsibility of the individual school. Please refer to CLEAPSS for further guidance www.cleapss.org.uk.

Teaching tip

If working with really young children a simple colander will work as a pinhole camera, creating multiple images of the Sun. Perhaps you could get in touch with local astronomers from a nearby university or an astronomical association who may be able to bring a telescope with a solar filter for older children to make safe but detailed observations of the Sun.

