Build a Sunspot Viewer

Estimated Time: 30-60 minutes

SUMMARY
The Sun might look constant but its surface is a constant churn of storms and swirling energy. It's impossible to safely view with just your eyes but a simple device can show you the darker spots on the Sun's surface where energy is flowing.

WHAT YOU'LL LEARN

- Students will learn the complexity of the surface of the sun.
- Students will learn how to build a sunspot viewer.

Materials Used	Resources Used
• Cardboard tube from toilet paper • Aluminum foil • Thumbtack or sewing needle • Scissors • White paper • Tape	• NASA site on sunspots: https://spaceplace.nasa.gov/solar-activity/en/ • Space Weather Live article on sunspots: https://www.spaceweatherlive.com/en/help/what-are-sunspots.html

WHAT TO DO

1. Take a piece of aluminum foil and completely cover one end of the tube. Tape it in place.
2. Carefully use a pushpin to poke a hole in the center of the aluminum foil end. It needs to be very small, only put the tip of the metal through.
3. Hold up your white paper or place it on the ground. This will be the "screen" that you project your image on.
4. Hold the tube in the sunlight but ***do not look directly at the Sun***. You should be holding the tube about three feet above your white sheet of paper.
5. Move the angle of the tube around until a circular image of the Sun appears on the white sheet of paper. You can adjust the tube to be closer or farther from the sheet of paper to get an image that's in better focus.
6. Can you see dark spots on the Sun's disc? These are sunspots where the Sun's magnetic forces keep solar energy from reaching the surface so they're cooler than the rest of the Sun. They're still thousands of degrees, of course!
7. Use a pencil to trace the outline of the Sun and the position of the sunspots.
8. Try this for a few days in a row. Do the sunspots move? Do any disappear or do new ones show up?

TIPS

- Sunspots are like weather on the Sun: they change all the time and move their position. Viewing several days in a row or even over the course of weeks will show just how much

the Sun changes. It also rotates so you should see the sunspots move across the face of the Sun as it spins.