Solar Telescope

Suggested Age / Grade Level	Concepts Covered
Grades 3 to 8	How to gather data on the Sun safely, what are sunspots, Sun's magnetic field, layers and atmosphere

Overview

The Sun cannot be observed directly, and so scientists have developed interesting ways to study it. Projecting the light of the Sun onto a white screen and following the dark spots over a long period of time allowed scientists to discover sunspots, the activity of the Sun's magnetic field and the movement of the Sun around its axis.

Learning goals

- Discovering ways to study phenomena that are difficult to observe directly
- Learning what sunspots are, how they come to be and why they exist
- Introduction to the Sun's magnetic field, how that creates solar flares and northern lights
- Learning about what Sun projections can actually tell scientists

Key Terms

Photosphere - The visible outer layer of the Sun that we see as sunlight
Sunspots - Cooler and darker regions on the Sun's surface
Magnetic Field - Moving gas particles can become charged as they move around, positive and negative, and these charged particles can exert a force on each other. Combine all of the positive and negative charges together and their forces, and this results in what we call a magnetic field.
Solar Eclipse - The Sun, Moon and Earth can be aligned in such a way, where the Moon blocks the Sun's light from reaching Earth, resulting in an eclipse
Solar Flares - Regions with high magnetic field activity, like sunspots, can burst resulting in solar flares visible on the outer layers of the Sun
Northern Lights - When the Sun's magnetic field is strong, it can affect Earth's magnetic field as well, resulting in the Northern Lights or Aurora Borealis

Activity Timeline

Activity	Time Required
Learning Goals & Introduction to the Sun (this includes layers of the Sun - photosphere, and sunspots)	5 minutes
Activity: Building their Sunspot Viewer & Viewing the Sun safely	30 minutes
Discussion: How sunspots are formed/Why they exist (Magnetic field, Solar Flares, Northern Lights)	5 – 10 minutes
End off by sharing with them how much information can be gained from Sun projections - Sun moving around its axis	2 minutes

Materials Needed

- Aluminum foil
- Pencils
- Rulers
- Push Pins or Sewing Needles
- Shoebox or 2-foot rectangular box (thin), Cereal box
- Transparent tape
- White paper

Additional Safety Requirement

- The kids can NEVER look at the Sun while setting up the experiment – the reason why they are making the equipment is because they don't have to look at it

Procedure – Activity

1. Cut a 3 cm x 10 cm opening on the side, and a 2 cm x 2 cm square opening at the end of the cardboard box
2. Tape foil over the opening at the end of the box
3. Make a pinhole in the piece of aluminum foil
4. Tape a white sheet of paper to the back of the cardboard box where the side opening is located
5. Aim the projector at the Sun
6. Look through the side opening to see the image of the Sun projected on the inside of the back end of the box