



Making a Homemade Sunspot Viewer

Elementary Grades

Lesson Summary

Students use a telescope to view sunspots without directly looking at the Sun

Prior Knowledge & Skills

Ability to:

- Use and manage scientific equipment
- Make and record observations

AAAS Science Benchmarks

The Nature of Science

Scientific Inquiry

The Nature of Technology

Technology and Science

The Physical Setting

The Universe

NSES Science Standards

Science as Inquiry

Abilities to do Scientific Inquiry

Understandings about Scientific Inquiry

Physical Science

Properties of Objects and Materials

Position and Motion of Objects

Earth and Space Science

Objects in the Sky

Changes in the Earth and Sky

Science and Technology

Understanding about Science and Technology

History and Nature of Science

Science as a human endeavor

NCTM Mathematics Standards

Measurement

Problem Solving

Reasoning and Proof

Teaching Time: One to two 45-minute periods

Materials per Team

- Telescope
- 12" x 12" cardboard
- Pencil
- Scissors
- Tape
- White poster board
- Building, tree, or music stand
- Tracing paper

Advanced Planning

Preparation Time: 20-30 minutes

1. Review lesson plans
2. Gather materials
3. Choose observation location
4. Form student teams

Live from the Aurora, pp. 11-12, NASA (2003)

http://sunearth.gsfc.nasa.gov/sunearthday/2003/educators_guide2003/pdf/lfa_educators_guide.pdf

Name _____

MAKING A HOMEMADE SUNSPOT VIEWER

MATERIALS NEEDED:

Telescope
 12-inch square piece of cardboard
 Pencil/scissors/tape
 White poster board
 Building, tree, or adjustable music stand
 Tracing paper



WARNING!!! It is never safe to look directly at the Sun because the Sun's rays can damage your eyes. It is safe to study the Sun's surface if you use a telescope to *project* the Sun's image onto a piece of paper.

PROCEDURE:

1. Set up a telescope *as if* you were looking at the Sun.
2. Cut a small hole in the center of the 12-inch square piece of cardboard.
3. Tape the cardboard with the hole in the center onto the large lens of the telescope. This cardboard serves 2 purposes. First, the outline of the cardboard will cast a shadow onto the second piece of paper which will make it easier to see the Sun's image. Second, the hole in the center will focus the image of the Sun on the second piece of paper.
4. Tack a piece of white poster board to a building or tree. If none are available, use an adjustable music stand. Focus the image of the Sun onto the piece of white poster board.
5. If the distance and focus are correct, on the poster board you should see a circle of light (the Sun's image) that is brighter at the center and darker around the edges. Inside the circle you should see some small dark spots which are sunspots. Trace the Sun and any sunspots that you see on the tracing paper.
6. Trace the Sun and its sunspots every day for 10 days if possible, weather permitting. Be sure to date each paper. Try to trace the Sun at the same time each day. Label your dots A, B, C, etc., to show their movement.

RESULTS:

When the distance and focus are correct, you should expect to see a circle of light (the Sun), which is brightest at the center and darker around the edges. Inside the circle, generally toward the middle of the Sun, you will see small black dots; these are sunspots!

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Name _____

SUNSPOT VIEWER REVIEW

Your class made many drawings of the Sun and the sunspots using the telescope. Lay your drawings on the floor or on a table. Arrange them in the same order they were made. Answer the following questions about your observations.

1. Does the Sun appear to change shape? What shape is it?

2. Do the sunspots appear to be moving?

3. Which direction are the sunspots moving—horizontal (across) or vertical (up and down)?

4. If the sunspots continue to follow the same pattern, draw what you think the next Sun and sunspots would look like.

5. Are all the sunspots the same shape? The same size?

