

## Sunspot Observing

### **Description:**

Construct a solar viewer and use it to record the changing location of sunspots. This requires that there be one or more visible groups of sunspots when you begin your observations. You will use your data to calculate the rotation rate of the sun.

*Minimum: 10 observations over 2 weeks.*

**Materials needed:** Solar viewer (tinfoil, safety pin, paper plate, white paper), binoculars or small telescope (optional)

### **Resources:**

The Sun Today

How to Build a Solar Viewer

### **Instructions:**

1. Go out each day for two weeks (up to 4 skipped days are ok for a total of 10 observations) and observe the sun through your solar viewer. You will need to choose a starting date when there are one or more groups of visible sunspots on the surface of the sun.
2. Sketch the locations, shapes and sizes of every visible sunspot on the sun. Be as accurate as possible in recording their sizes and locations relative to the disk of the sun. Try to keep a constant frame of reference by observing the sun around the same time every day and orienting your solar viewer the same way. Note the date and time of each observation.
3. Repeat this process a minimum of 10 times.

### **Data:**

1. 10 sunspot observations

### **Questions to Address in Your Poster's Data Analysis Section:**

1. Estimate the size of your sunspots as a fraction of the size of the disk of the sun. How does this compare to the size of the Earth if it were right up next to the sun?
2. How close to the edge of the disk of the sun could you see sunspots? Were there any visible differences between the center of the sun's disk and its edges? If so, what might cause this?
3. Arrange your sunspot sketches sequentially. Label each visible group of sunspots.
4. Track each visible group of sunspots across the surface of the sun. How far did it move in a day? In a week? How far did it move across the visible disk of the sun in that time?
5. Use this information to calculate the rotation rate of the sun for EACH visible group of spots.

6. Were your rotation rates for each group of sunspots the same? Why or why not?
7. Discuss the sources of error in your observations and estimate the percent error in your calculation(s) of the rotation rate.