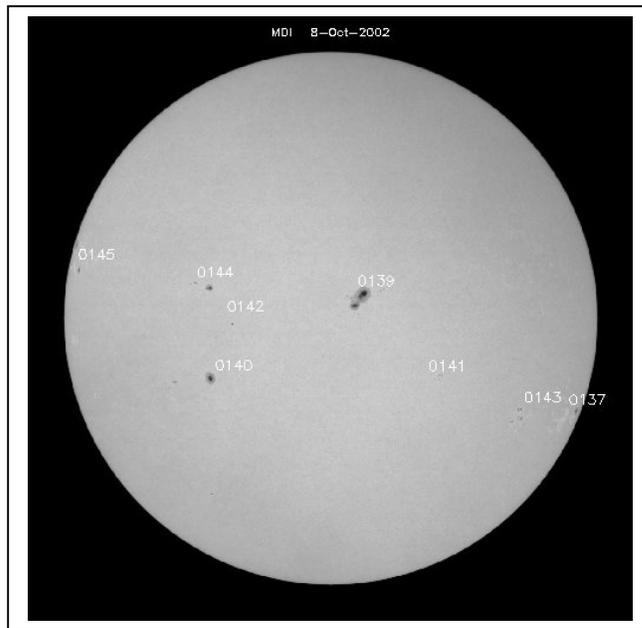


Observing the Sun

Middle and High School

These activities can be used with observations of the Sun that you get from [Views From Observatories](#) or [Views From Satellites](#).

1. Go to the web site and print an image of the Sun each day for 8 to 10 days (or more!). You can also use the archive of images and print an image of the Sun each day for 8 to 10 days (or more!). Be sure that each image has a date and time telling you when the image was recorded. Try to get an image from the same time of day on each day. Label each of your sunspots. While you can use any name, number, or letter to label your sunspots, scientists have agreed to number the sunspots in the order they appear. The sunspots and their numbers for today are shown below. This number system will be necessary to vote for your [Sunspot Suspect](#).



2. Look carefully at the sunspots. Discuss the differences you see and make predictions for observations you will take during the next few days. Don't forget to relate these observations to the Solar Cycle and predict where you think we are in the cycle now, and what you think the solar activity will be for the next year. Will it increase or decrease? Why do you think so?
3. Don't forget to vote for the [Sunspot Suspect](#), the sunspot most likely to have the right conditions for a solar flare.

4. Record the number of sunspots on the Sunspot Observation Graph. The Day axis refers to the number of days since the beginning of observations. If a day is skipped because of a weekend or cloudy weather, that day must be skipped on the graph.
5. Choose a favorite sunspot and estimate its size. It is often useful to compare the size of a sunspot to the size of Earth. Research on the size of the Sun and the size of the Earth. The “Sun and Earth Size Comparison” as part of the Athena Curriculum (<http://inspire.ospi.wednet.edu:8001/curric/space/sun/sunearth.html>) could be a good place to start this exploration.
6. Create their own “flip” book of index cards to see how the sunspots have changed position.
7. Complete the Sunspot Observation Graph. Access the International Sunspot Number compiled by the Sunspot Index Data Center in Belgium at http://science.nasa.gov/ssl/pad/solar/greenwch/spot_num.txt. (The numbers tabulated in are the monthly averages of SunSpotNumber (SSN) and standard deviation (DEV) derived from the International Sunspot Numbers. You only need the SSN.) Graph the last 3 to 5 years of data. Different groups of students should graph different years and then put all graphs together to observe long-term trends. You should be aware that official sunspot numbers will probably be higher than your count. Researchers use a different system for determining sunspot numbers (see http://www.sunspot.noao.edu/IMAGES/sunspot_numbers.html). Compare the pattern you observed for numbers of sunspots on the Sunspot Observation graph with the trend you can see on the graph of data from the International Sunspot Number data. (If you wish to become more involved in contributing to counts of sunspots, you can find out more at the SPA (Society for Popular Astronomy) Solar Section (<http://www.popastro.com/sections/solar/intro.htm>).)
8. Provide an explanation for the change in position of the spots.
9. Research Galileo and his exploration of sunspots. Visit <http://es.rice.edu/ES/humsoc/Galileo> for more information

Extensions:

1. The images can be used to calculate the period of rotation in an excellent math lesson. The Stanford Solar Center offers *The Spinning Sun*. (<http://solar-center.stanford.edu/spin-sun/spin-sun.html>)
2. The Science Education Gateway (SEGWAY) web site offers excellent activities to extend your understanding of sunspots and their dynamics in a lesson called “Sunspots”. This lesson covers solar science, ancient and modern, features an interactive research exercise in which students attempt to correlate the areas of sunspots with those of x-ray active regions. Self-guided sections on history and modern study include researcher interviews. (<http://cse.ssl.berkeley.edu/segwayed/abtsunspots.html>).