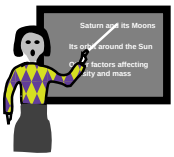
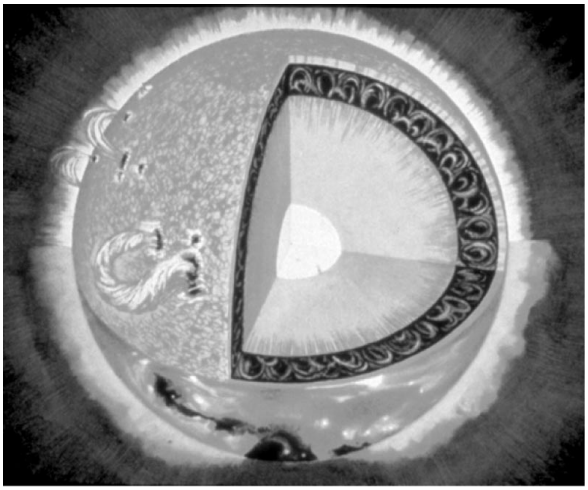
ACTIVITY 1:
FEATURES OF THE SUN

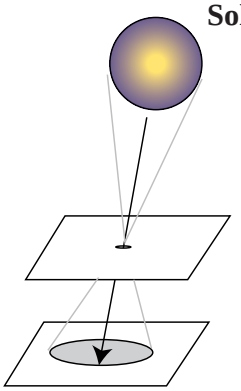


Guide to Teachers



Goal: Students will learn that the Sun contains many complex features and compare this to their own prior knowledge about the Sun.

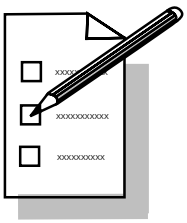
This activity introduces Solarscapes and allows students to learn about various features on the Sun, including sunspots. It functions as a DISCUSS phase for the Solarscapes unit overall.



Caution: Never look directly at the Sun. To view the Sun, project an image through a card or sheet of notebook paper, pierced with pin sized hole, onto a sheet of white paper. The Sun's inverted image will appear on the paper below.

MATERIALS NEEDED

- One copy of the student activity, "Features of the Sun" (included)
- A schematic diagram of the Sun (Figure 1) and two sets of images that illustrate the Sun as seen in different wavelengths (Figures 2 and 3, included)
- A photocopy of the student activity, preferably one copy per student. Provide the worksheet first, then the rest of the text once students have drawn their initial picture of the Sun
- One photocopy of labels per group of students (original included)
- Colored pencils
- Scissors
- Large sections of paper (newsprint, etc.)



Procedure:

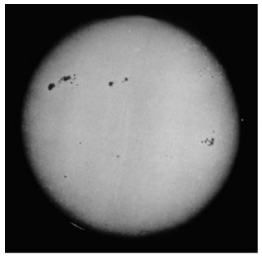
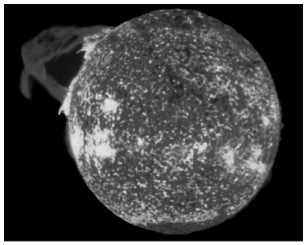
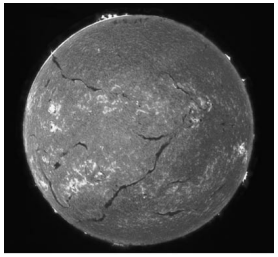
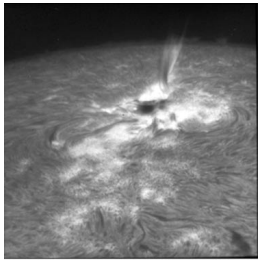
DISCUSS: Ask the class to discuss what they know about the Sun and what they would like to know. Brainstorm a list of ideas and ask the students to record this list in their notebooks. Working in groups of three or four, have students draw the Sun with as many features as they know about, and make a list of those features. Students are to write down these ideas and copy the group diagram in the space provided in their STUDENT WORKSHEET.

EXPLORE: After that, ask the students to read the **"Features of the Sun"** (in the Student Guide section). Have them compare what they read to their picture. As they read, they are to locate the boldface words from the reading that are on the accompanying schematic diagram titled "The Sun" (Figure 1).

APPLY: Students are to place labels of the Sun's features provided on the photographs in Figures 2 and 3 so that the arrow on the label points to the name of the feature where it is located. They are to identify as many different features in the time allowed (including locating the same feature on as many different photographs as possible).

REFLECT: On a large sheet of paper, each group of students is to draw and color a sketch for the exterior features of the Sun that were identified on the photos. The drawings are to be as realistic as possible. They then compare their new drawing to their initial drawing. How many features did they know about and how many were new? Students are to write down their comparison. The drawings are to be posted and students are to take a "wisdom walk" (without talking, go around the room and view the other group drawings). Students then are to use Think-Pair-Share with a member of another group to briefly discuss what they observed during the wisdom walk. Observations on what they learned are to be recorded in their portfolio notebooks, along with questions they have. Students are also to write a short essay to be turned into the teacher that answers the "Problem" question(s) at the beginning of this activity.

Students should identify the following features:

Visible Sun	Eclipse	Extreme UV	H-Alpha	Solar Flare
				
Photosphere Sunspots	Corona Coronal Hole Prominences Helmet Streamers	Granulations Plage Prominences Sunspots	Chromosphere Filaments Plage Prominences Sunspots	Solar Flare Sunspots
Visible or White-light images of the Sun show the photosphere and sunspots. Sunspots are regions of intense magnetic fields. They appear dark because they are somewhat cooler than the surrounding gas.	A solar eclipse shows the ethereal corona -- the crown of light that surrounds the Sun. Prominences can also be seen as small white blotches in the photograph.	This extreme ultraviolet image of the Sun shows the chromosphere, which is a thin region of the Sun just above the photosphere. A giant prominence can also be seen.	Light from hydrogen gas just above the photosphere shows the bright plages that surround the active sunspot regions. Dark string-like filaments are also seen that are in fact prominences seen head-on. The bright structures on the limb are pominences.	A solar flare is a highly concentrated explosive release of energy within the solar atmosphere that occurs near sunspots. Flares emit enormous amounts of energy.

Scoring Rubric for Activity 1: Features of the Sun

Student Name: _____

Individual Assessment (goal met if student achieves a "2")

Task(s)	0	1	2	3	4
Essay on the Sun's features	Student did not participate or write essay.	Student's essay incorrectly describes solar features or writes incomprehensible essay.	Student is able to identify most features correctly in a reasonable essay.	Student provides very clear essay that correctly describes all features of the Sun presented in the lesson.	Student does all of #3, but also compares and contrasts.

Group Assessment (goal met if group achieves a "2")

Task(s)	0	1	2	3	4
Diagram of Sun's features	Group does not produce diagram.	Group produces a diagram of Sun with major features incorrectly indicated.	Group produces a diagram of Sun with major features correctly indicated.	Group produces a diagram with the major features correctly indicated, drawn, and colored realistically and neatly.	

SUGGESTED USE: Make one copy per student; there is also room for you to add your own task and scoring criteria.