

# Sunspot Numbers

Elementary Grades

## Lesson Summary

Students graph data for the number of sunspots per year for 10 years

## Prior Knowledge & Skills

Completed the lesson:

- *Sunspot Flip Book*

## AAAS Science Benchmarks

### **The Nature of Science ★**

*Scientific Inquiry*

### **The Nature of Mathematics**

*Patterns and Relationships ★*

*Mathematical Inquiry*

### **The Nature of Technology**

*Technology and Science*

## NSES Science Standards

### **Science as Inquiry ★**

*Abilities to do Scientific Inquiry*

*Understandings about Scientific Inquiry*

### **Science and Technology**

*Understandings about Science and Technology*

### **History and Nature of Science**

*Science as a human endeavor*

## NCTM Mathematics Standards

### **Algebra**

### **Data Analysis & Probability**

### **Reasoning and Proof**

**Teaching Time:** One 45-minute period

## Materials per Student

- Student page; *Sunspot Numbers*
- Pencil, pen

## Advanced Planning

**Preparation Time:** 20 minutes

1. Review lesson plans
2. Copy student page


*Live from the Aurora*, pp. 15-16, NASA (2003)

[http://sunearth.gsfc.nasa.gov/sunearthday/2003/educators\\_guide2003/pdf/lfa\\_educators\\_guide.pdf](http://sunearth.gsfc.nasa.gov/sunearthday/2003/educators_guide2003/pdf/lfa_educators_guide.pdf)

Name \_\_\_\_\_

## SUNSPOT NUMBERS

Astronomers have found out that the number of sunspots increases and decreases every 11 years. Make a pictograph of the number of sunspots seen for each of the years listed below.

Draw a  for every 10 sunspots.

1991-144 sunspots

1995-10 sunspots

1999-84 sunspots

1992-82 sunspots

1996-13 sunspots

2000-104 sunspots

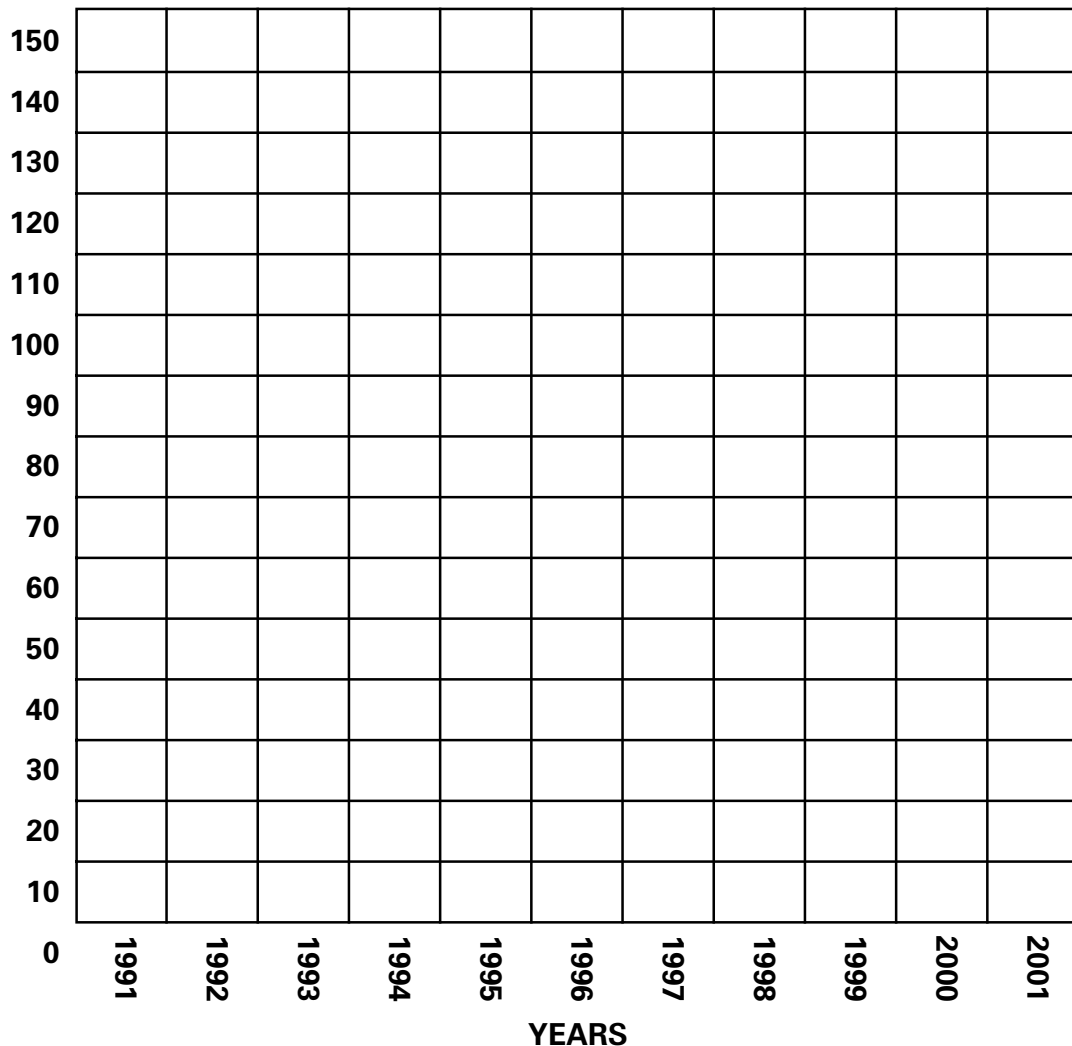
1993-48 sunspots

1997-41 sunspots

2001-132 sunspots

1994-26 sunspots

1998-81 sunspots



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**GRADES 3-5****Vocabulary:**

axis	element
chromosphere	observation
convection layer	photosphere
core	radiation layer
cycle	satellite
diameter	sphere
dwarf	ultraviolet rays

**Activities:**

1. Pre/Post Assessment  
Student worksheet to assess the student's prior knowledge of the Sun and sunspots.
2. Background information on the Sun and sunspots  
Read and discuss the NASA booklet *Our Very Own Star: The Sun* listed in the Internet guide and the book *The Sun* by Herbert Zim listed in the resource guide. Use this information for a class discussion and review about facts about the Sun—its type, shape, distance, size, etc. See Internet sites #1, 10, 11, 12, 14, 15, and 16, page 22.
3. Galileo Sees the Light  
Information and question sheet on Galileo, his telescope, and experiments observing the Sun, sunspots, and the planets. See Internet sites #3, 8, and 11.
4. Sunspot Poems  
After reading the books and reviewing the Web sites in activity #2, students will write a poem about sunspots. See Internet site #11—Solar poetry.
5. Layers of the Sun Worksheet  
Student worksheet that has the student labeling the 4 layers of the Sun and the 2 layers of the Sun's atmosphere. See Internet sites #6, 11, 12, and 14.
6. Our Very Own Star: The Sun puzzle  
Student worksheet reviewing basic facts about the Sun and sunspots. (Activities #7-10 are found in the grades K-2 section.)
7. Making a Homemade Sunspot Viewer  
Teacher worksheet that gives directions on how to assemble and use the sunspot viewer. The class needs to complete this activity with teacher direction. Teacher should then save the tracing sheets in order to complete the sunspot viewer review. See Internet site #2.
8. Sunspot Viewer Review  
Student worksheet to discuss tracings of the Sun and the sunspots.
9. Sunspot Flip Book  
Students will assemble the Flip book.
10. Sunspot Flip Book Journal  
Student worksheet analyzing the results of the sunspot flip book.
11. Sunspot Numbers  
Student worksheet that demonstrates the 11-year cycle of sunspots. See Internet sites #7, 11, and 17.

Editor's Note: References and web sites referred to in the "Activities" section can be found at the URL at the bottom of the first (introductory) page of this activity.

