

# Sunspots Test

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Grade: \_\_\_\_\_ Date: \_\_\_\_\_

Teacher: \_\_\_\_\_

## History Section

1. Why is the Sun important to life on earth? Please list three ways light and heat from the Sun help us to live.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

2. Why did some ancient cultures observe and worship the Sun?

\_\_\_\_\_

\_\_\_\_\_

3. How did Europeans such as Galileo observe sunspots?

\_\_\_\_\_

\_\_\_\_\_

4. We should never look directly at the Sun. However, can you briefly describe a safe and easy way to observe sunspots? Draw a picture if that is easier.

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5. Scientists in the 1600's did not yet know what caused sunspots. What ideas, beliefs, and opinions did they have about them?

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### **Modern Research Section**

6. In Galileo's time (1564 – 1642) observers could only view the Sun in visible, or white light. Today however, astronomers have very powerful telescopes which can observe the Sun in great detail, and in other wavelengths of light. Name any two types of non-visible light these new instruments can detect?

1. \_\_\_\_\_

2. \_\_\_\_\_

7. List at least two facts about the Sun's mass, its composition, or its structure.

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8. How big is an average sunspot?

- a. about the size of San Francisco
- b. about 100 miles across
- c. about 1000 miles across
- d. about the size of the Earth
- e. about 100 times the size of the Earth

9. What happens in the Sun's convection layer?

- a. Heat is transported to the surface by flows of hot plasma.
- b. Magnetic fields are drawn down beneath the surface.
- c. Light is held for millions of years before escaping.
- d. Cool plasma flows back toward the core
- e. a and d
- f. a and b

10. What is the source of the Sunspots' magnetic fields?

- a. the Sun's molten iron core
- b. moving currents of electrically charged particles
- c. a big bar magnet
- d. the Earth's magnetic field

11. Can you describe what happens during the Sunspot cycle? How long does it take to complete a cycle?

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12. It has been speculated that the solar minimum affects the climate of the Earth. Can you name one famous, unusually cold period in history that corresponds to low levels of solar activity?

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13. How does the Earth's magnetic field protect us?

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14. What impact does space weather (geomagnetic storms) have on Earth?

- a. Satellites can be disabled or have their orbits decay.
- b. Auroras can become more frequent and bright.
- c. Power grids can be overloaded and cause power outages to cities and homes.
- d. Radio transmissions can be drowned out.
- e. b and d
- f. all of the above

15. What is a sunspot? Please draw a picture of a sunspot, and label as many parts as you can. Draw the magnetic field lines around the Sunspot(s).

16. How is a sunspot created? Describe what happens in the Sun to produce a sunspot.

