



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

## Solar Dynamics Observatory

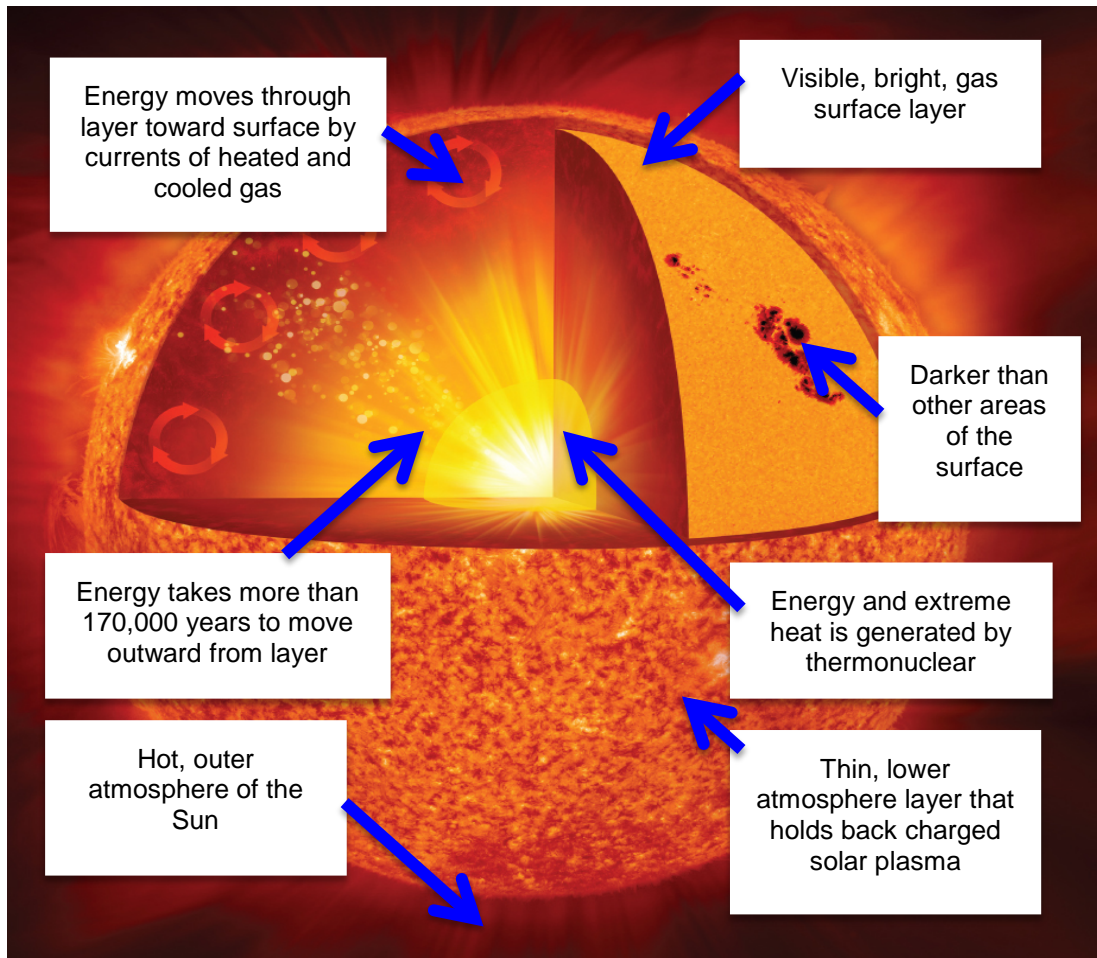
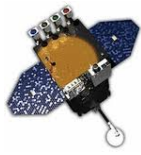
Pre & Post Assessment

☐ Pre Assessment or ☐ Post Assessment (check one)

Instructions: Read each question and select the correct response(s).



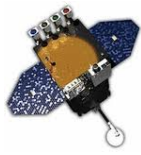
1. \_\_\_\_\_ is the primary source of energy that sustains life on Earth.
- ☐ The Earth's core
  - ☐ Fossil fuel
  - ☐ The Water Cycle
  - ☐ The Sun



2. Correctly match each part of the Sun (letter) with its description:

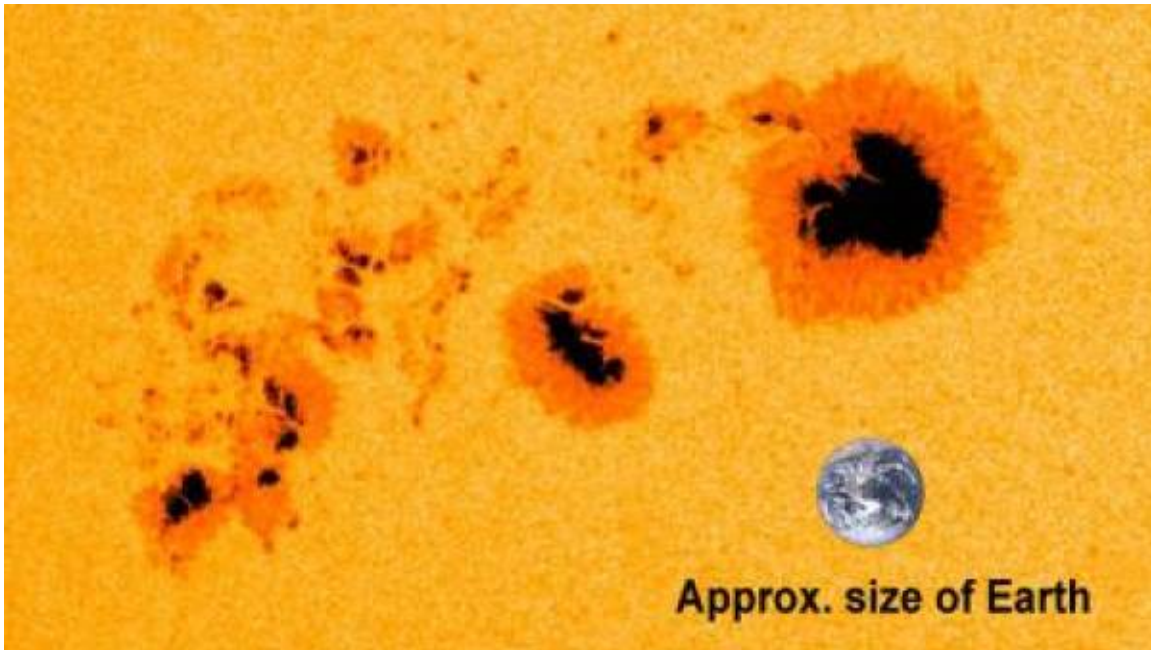
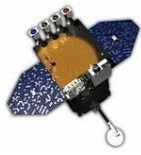
- |                    |                   |
|--------------------|-------------------|
| A. Chromosphere    | E. Photosphere    |
| B. Convective Zone | F. Radiative Zone |
| C. Corona          | G. Sunspots       |
| D. Inner Core      |                   |

Letter	Part of Sun Description
	Energy takes more than 170,000 years to move outward from layer
	Darker than other areas of the Sun's surface
	Visible, bright, gas surface layer
	Hot atmosphere of the Sun
	Thin, lower atmosphere layer that holds back charged solar plasma
	Energy moves through layer toward surface by currents of heated and cooled gas
	Energy and extreme heat is generated by thermonuclear reactions



3. The Sun contains about 99% of all the mass in the Solar System; the planets and all other naturally occurring space objects consist of only 1% of its mass. Choose the statement that explains why planets, asteroids, and comets orbit the Sun:

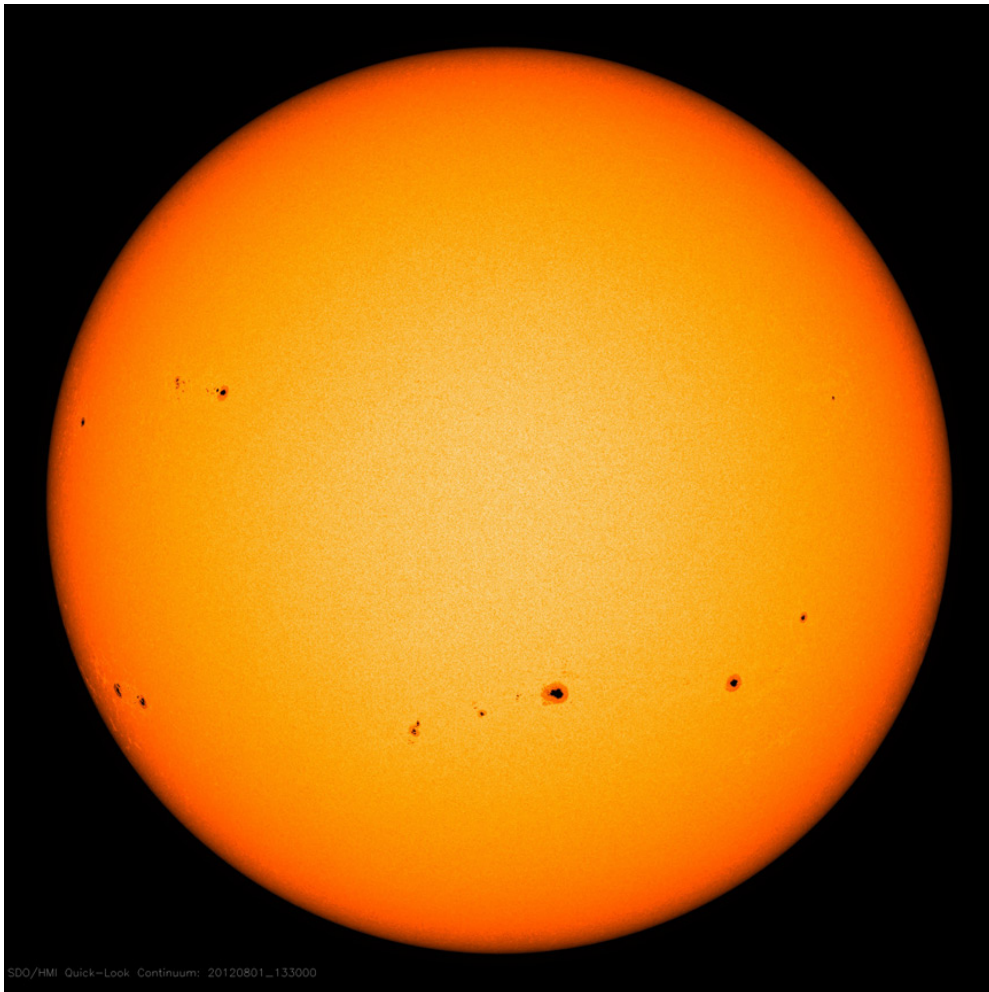
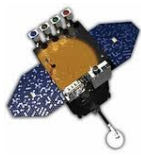
- ☐ The greater the mass of an object, the greater its force of gravity on other objects.
- ☐ The smaller the mass of an object, the greater its force of gravity on other objects.
- ☐ The greater the mass of an object, the lower its force of gravity on other objects.
- ☐ The smaller the mass of an object, the lower its force of gravity on other objects.



4. Sunspots appear dark because they are \_\_\_\_\_ than the surrounding surface area of the sun.

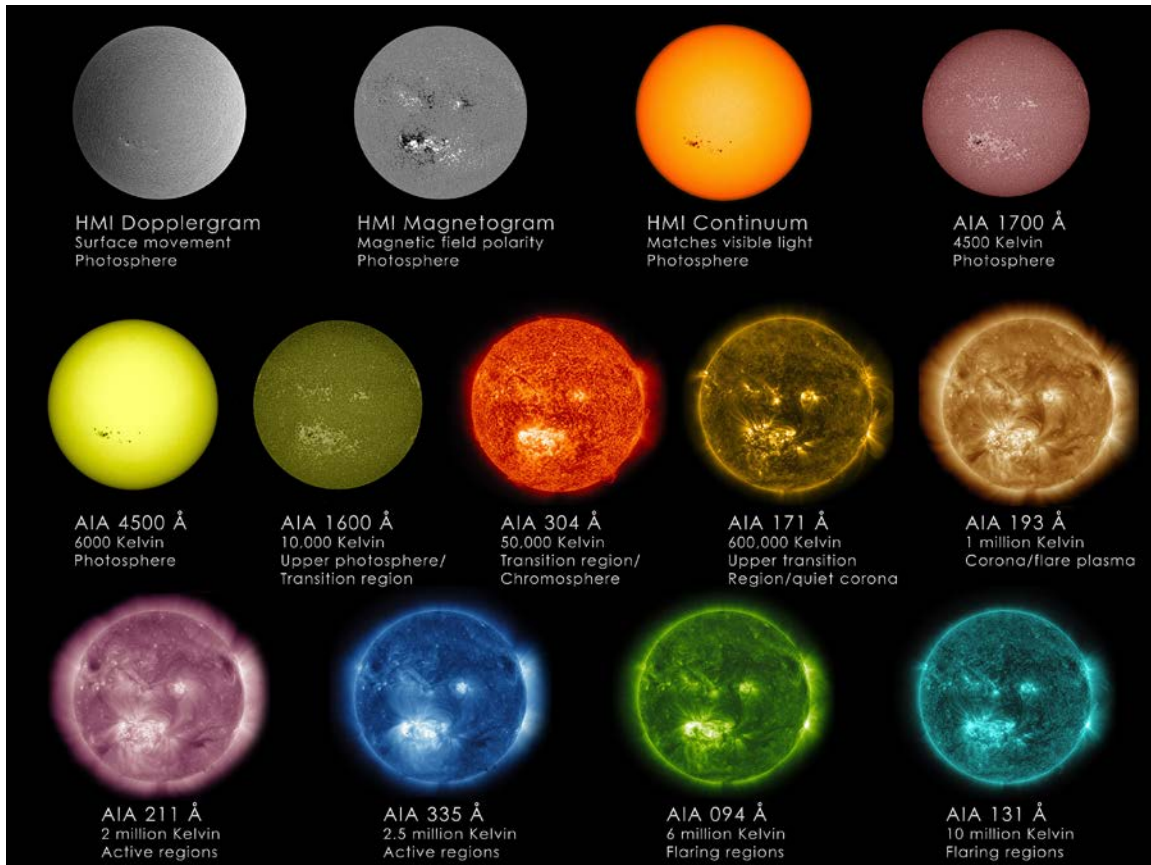
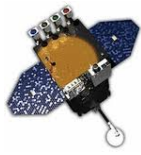
- ☐ hotter
- ☐ cooler
- ☐ less active
- ☐ made of different material





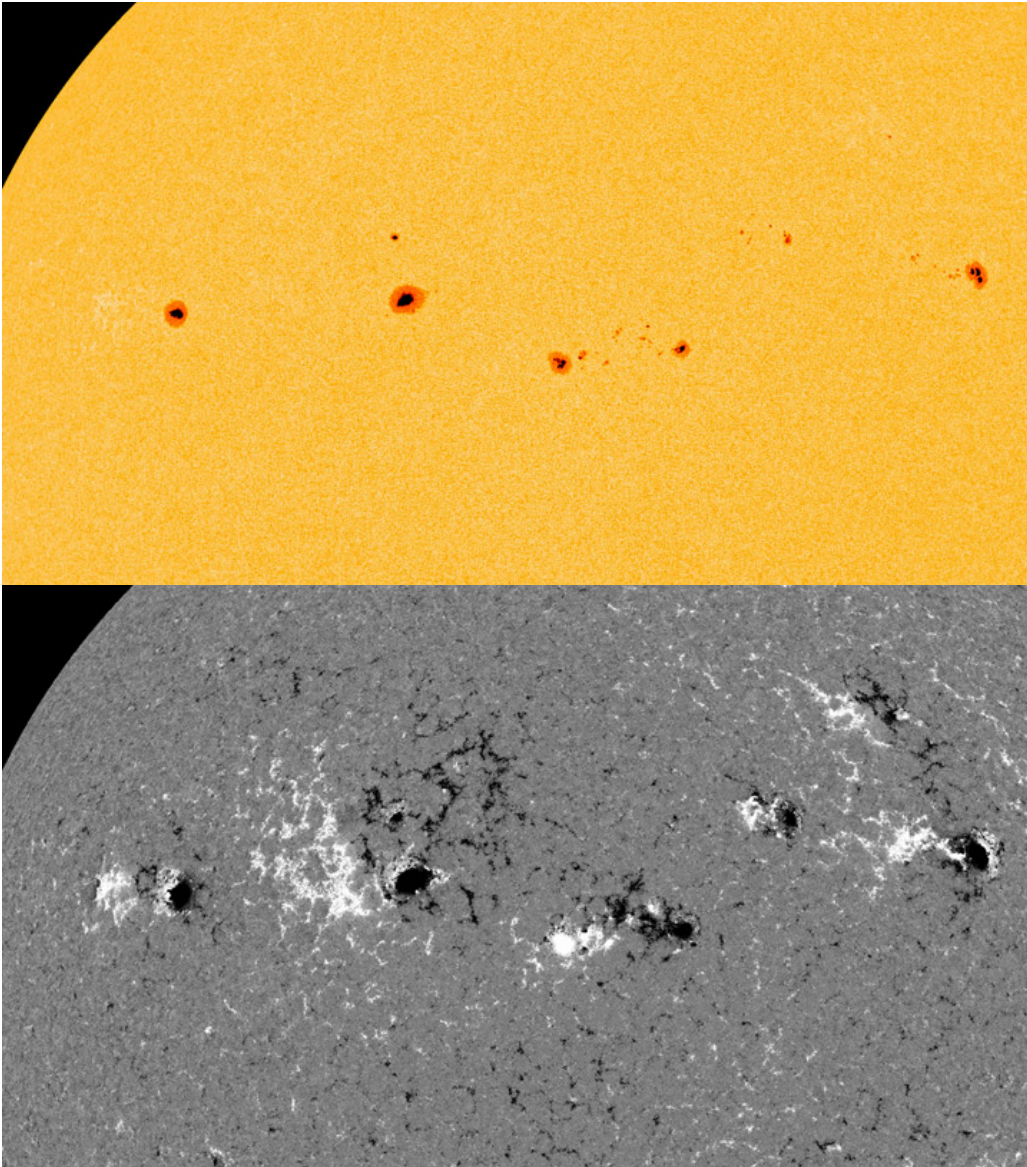
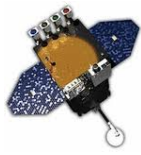
## 5. Sunspots

- float in the atmosphere just above the Sun's surface and indicate the direction of the solar winds.
- are located on the Sun's surface and have magnetic fields with opposite polarities (+ and -), similar to a magnet.
- are located just below the Sun's surface in the convection zone, which causes their movement.
- are imperfections on the Sun's surface and indicate stable regions inside the Sun.



6. The Electromagnetic Spectrum represents different electromagnetic radiation wavelengths of \_\_\_\_\_.

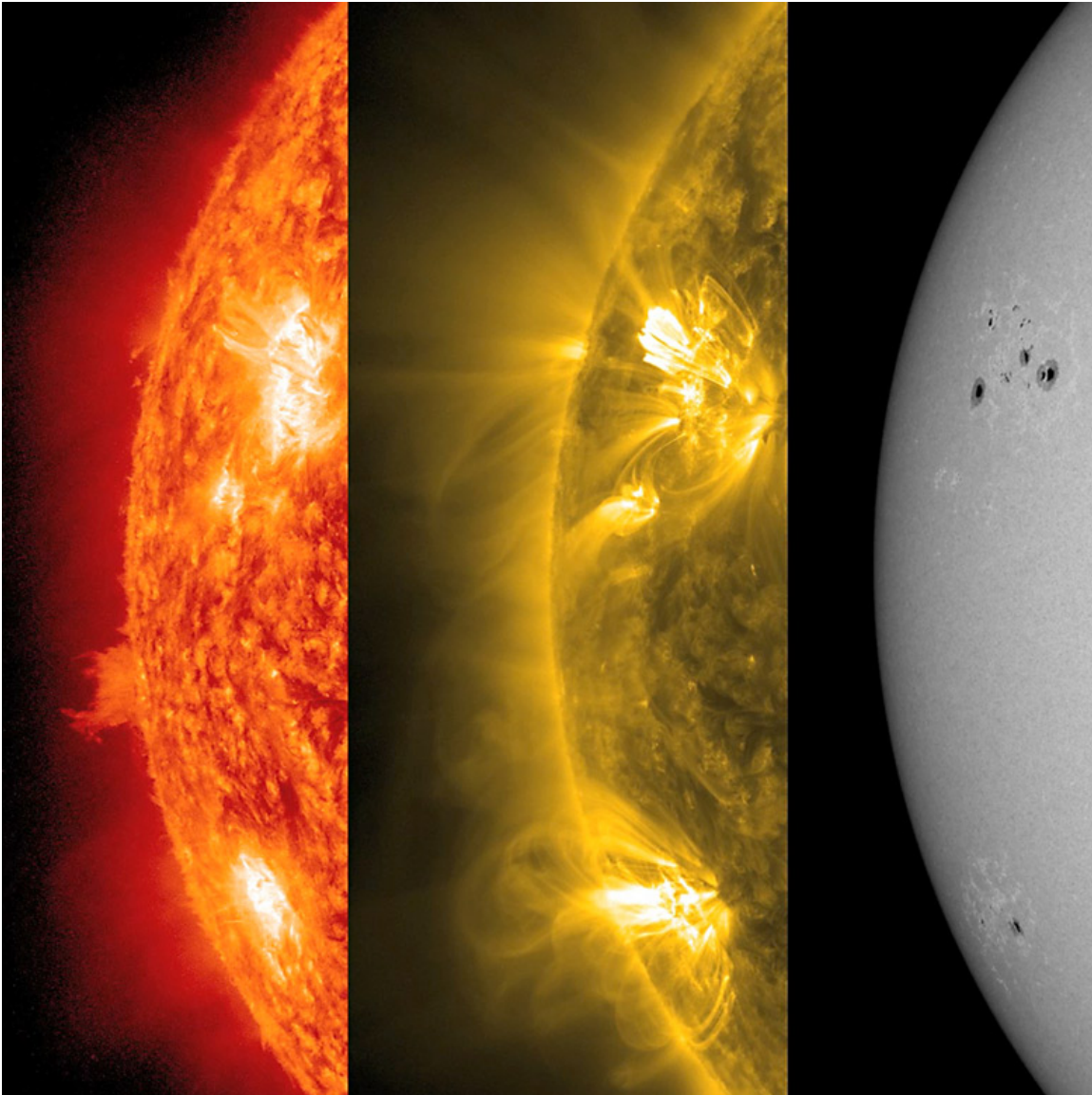
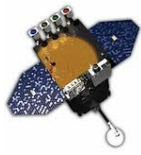
- light energy
- mechanical energy
- sound energy
- chemical energy



7. The size and amount of sunspots on the Sun are directly related to its level of solar activity.

- ☐ True
- ☐ False
- ☐ Do Not Know

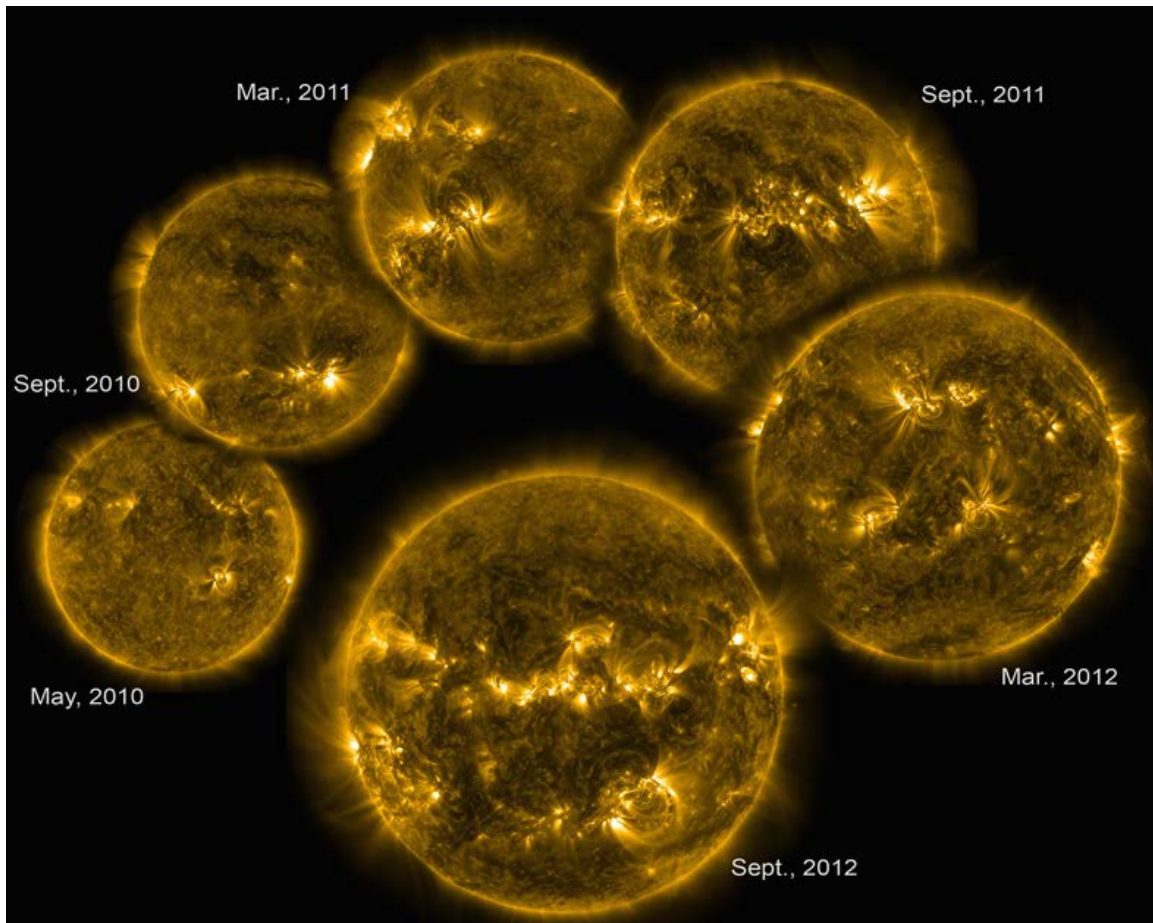
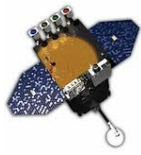




8. The Solar Cycle occurs about every 22 years and consists of an 11-year solar maximum and an 11-year solar minimum.

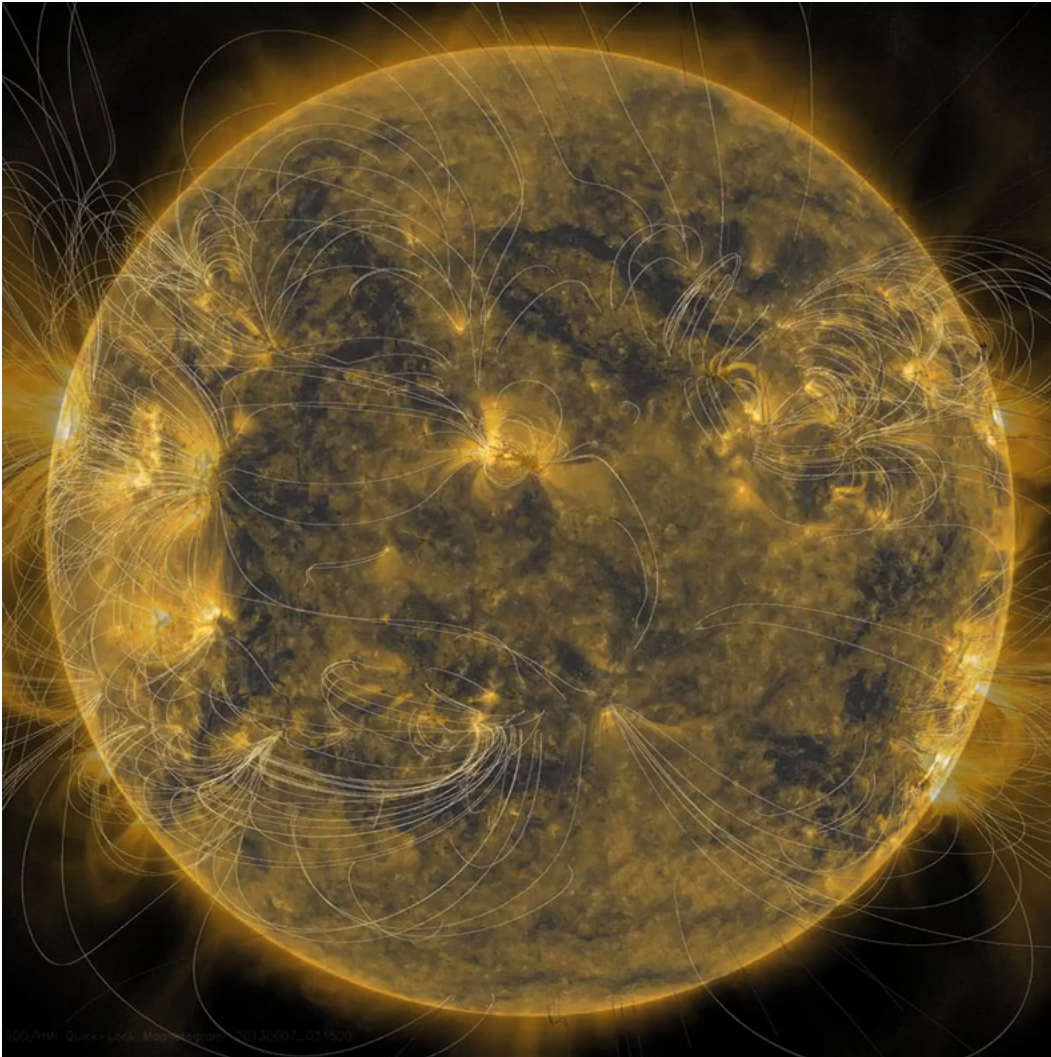
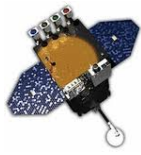
- ☐ Strongly Disagree
- ☐ Somewhat Disagree
- ☐ Do Not Know
- ☐ Somewhat Agree
- ☐ Strongly Agree





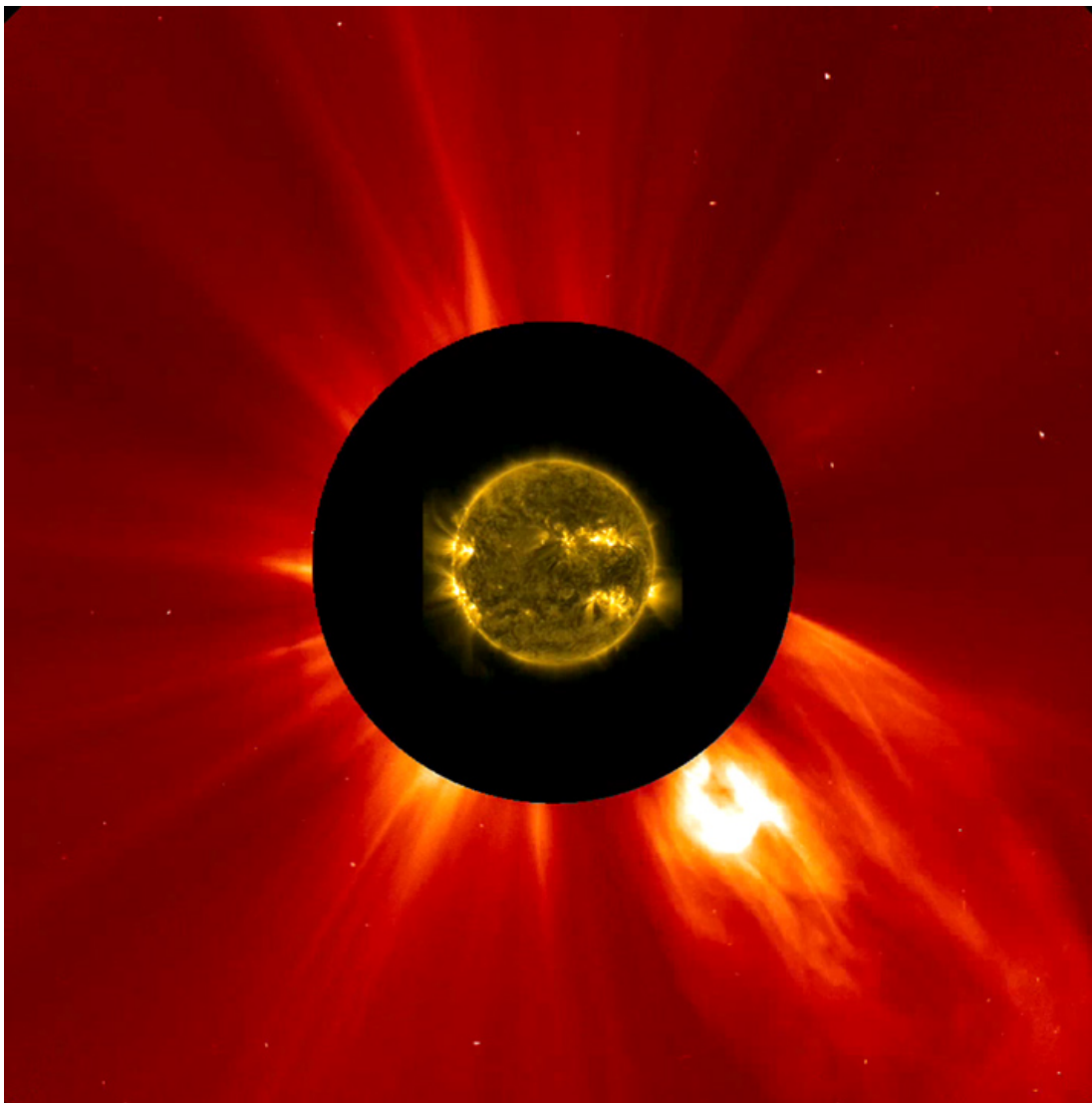
9. Which of the following situations occur on the Sun during its solar maximum?

- ☐ Lowest amount of sunspots and solar activity, magnetic poles are stable
- ☐ Lowest amount of sunspots and solar activity, magnetic poles exchange places
- ☐ Greatest amount of sunspots and solar activity, magnetic poles exchange places
- ☐ Greatest amount of sunspots and solar activity, magnetic poles are stable



10. Solar activity (including sunspots) is caused by \_\_\_\_\_ .

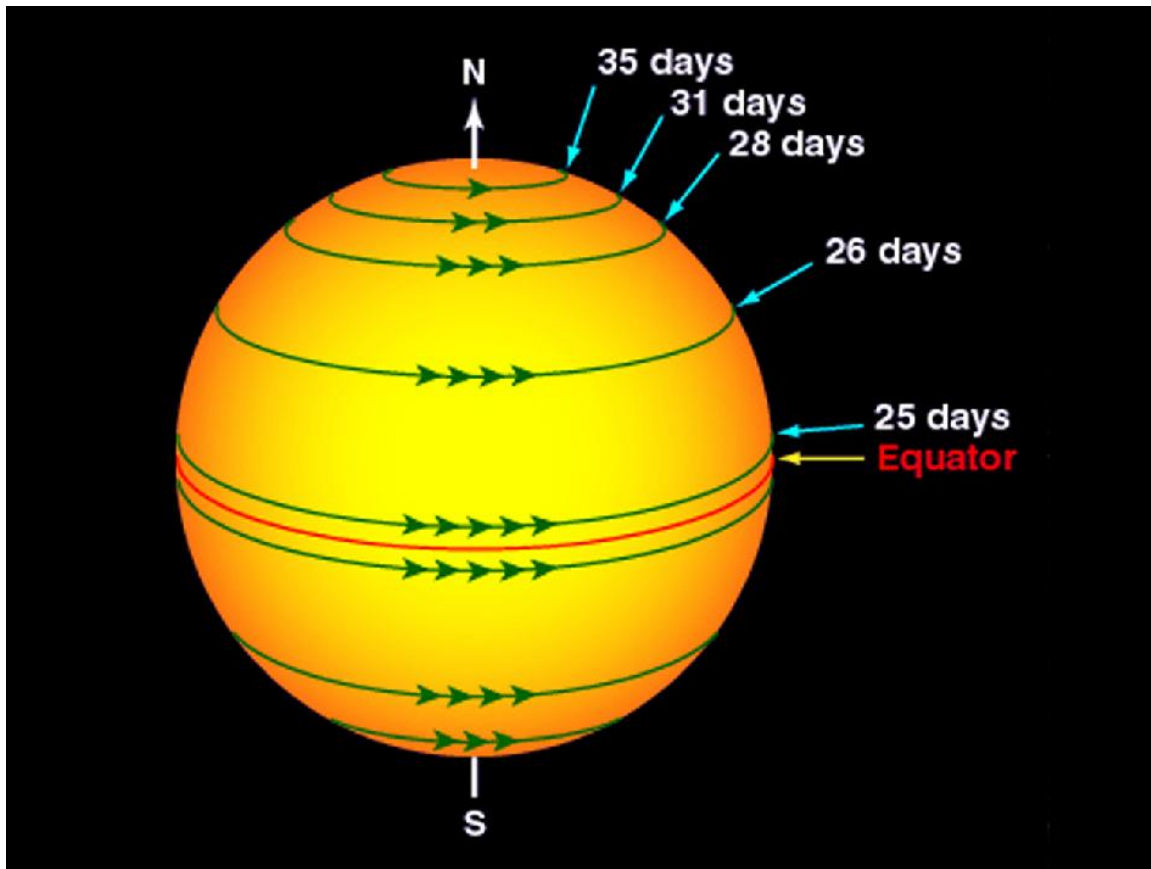
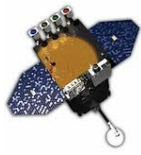
- ☐ electrical currents flowing inside the Sun
- ☐ heat from the Sun's core being released at the surface of the Sun
- ☐ the change in density between the Sun's core and its surface
- ☐ changes in the magnetic field of the Sun



11. The two sources of solar activity that are the main cause of solar storms and Space Weather are (select two answers):

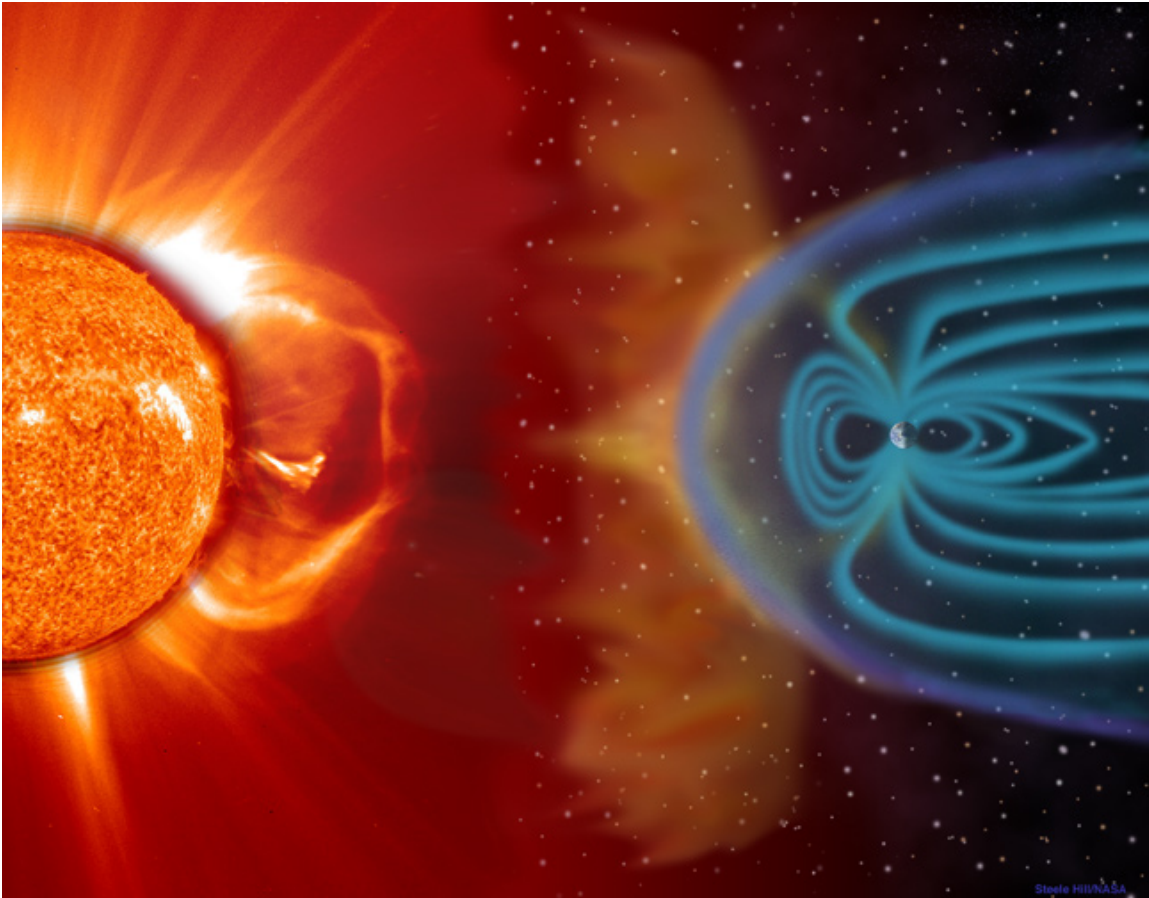
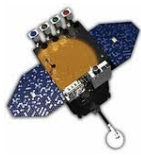
- ☐ Solar Flares
- ☐ Coronal Streamers
- ☐ Coronal Loops
- ☐ Coronal Mass Ejections (CMEs)
- ☐ Solar Wind





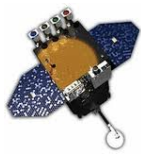
12. The Sun rotates faster at its equator than at its poles, which causes the Sun's magnetic field lines to become twisted and stressed beyond their limits. The magnetic field lines then release huge amounts of energy through solar activity, which can cause solar storms that affect Earth.

- ☐ True
- ☐ False
- ☐ Do Not Know



13. The magnetosphere \_\_\_\_\_ .

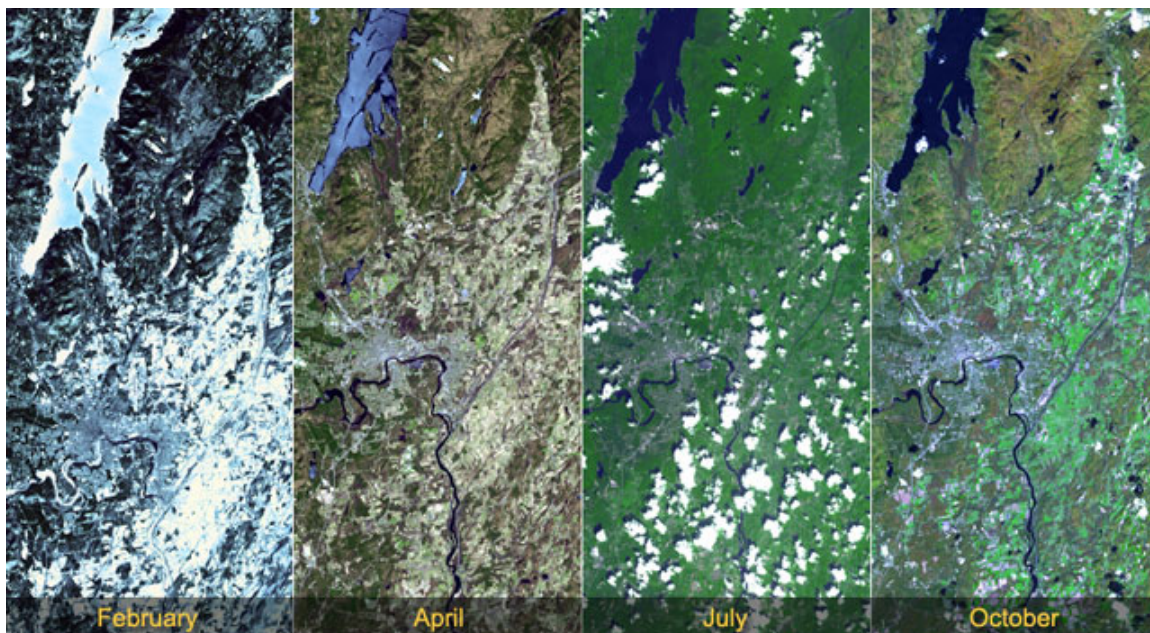
- is the protective layer of the Earth's atmosphere that can absorb harmful electromagnetic radiation from X-rays, and Gamma rays
- is the magnetic force located inside of Earth that drives plate tectonics
- is the magnetic field that surrounds Earth and protects it from charged particle radiation released from solar storms that are carried by the solar wind
- is the magnetic field that extends from the surface of the Earth to the surface of the Moon



14. It is important to improve our understanding of Space Weather because Space Weather that reaches Earth can (select all that apply):

- Cause surges in power grids that can result in power outages and blackouts in our electricity supply
- Disrupt our navigation and communication systems (e.g., aircraft, GPS, cell phones, ATMs)
- Cause colorful auroras often seen in the polar latitudes (Aurora Borealis in the Northern Hemisphere and Aurora Australis in the Southern Hemisphere)
- Harm astronauts in space (high-energy radiation exposure to x-rays and gamma rays)
- Damage sensitive electronics on orbiting spacecraft (e.g., satellites, space telescopes)
- None of the above





15. The \_\_\_\_\_ is the cause of seasons on Earth.

- ☐ change in the distance between the Earth and the Sun
- ☐ tilt of Earth's axis
- ☐ change in the amount of released energy from the Sun
- ☐ change in the amount of clouds

End of Assessment