History Channel's *Universe: Secrets of the Sun*

Name: _____ Period: _____ Date: _____

1. What two chemical elements make up the majority of our Sun? (1:00)

2. Explain nuclear fusion and how it powers the Sun. (4:30)

3. How hot is the core of our sun? (5:00)

4. How dense is the core of our sun? (5:20)

5. What is plasma? How does it compare to the other three states of matter? (solids, liquids, and gases) (5:30)

6. The sun fuses 600,000,000 tons of Hydrogen into 595,000,000 tons of Helium every second. This leaves 5,000,000 tons of mass left over. Where does this mass go to if mass must be conserved? (6:45)

7. What are photons? How do they make their way to the surface of the sun? (7:45)

8. How long does it take a photon of light to make it to Earth? (9:20)

9. Where did the material for the sun originally come from? (11:00)

10. What percentage of the total mass in the solar system resides in the sun? (11:30)

11. How long does plasma take to rotate at the equator of the sun? How about at the poles of the sun? (13:30)

12. Why does the sun have so many magnetic fields? (13:50)

13. What are sunspots? Why are they darker than the surrounding photosphere? (15:20)

14. What are solar flares? (17:00)

15. What happens when solar flares turn into coronal mass ejections? (20:10)

16. How do solar storms affect the Earth? (23:00)

17. Why does solar wind make its way through to the north and south poles? (27:00)

18. What are the auroras? (29:15)

19. How could a major solar storm lead to chaos on the Earth? (33:00)

20. What is the 11 year solar cycle? (34:00)

21. What superheats the corona of the Sun which is the outermost layer of the Sun? (38:00)

22. What is the ultimate fate of our sun in about 4.5 billion years? (43:00)

Post-Video Questions

23. Draw a diagram of the internal structure of the Sun using your textbook. Label each layer of the Sun, define each layer of the Sun, and record each layer's associated temperatures. Draw on a separate piece of paper if needed.

24. How big is the Sun in terms of distance from Earth, radius, mass, surface area, and volume? Also include the values for Earth as a comparison and then divide the terms to find out how much bigger the Sun is!

Body	**Distance of Sun from Earth in miles and kilometers?**	**Radius (r)**	**Mass**	**Surface Area ($4*\pi*r^2$)**	**Volume ($4/3*\pi*r^3$)**
Sun		695,500 km	1.99×10^{30} kg	6.08×10^{12} km^2	1.409×10^{18} km^3
Earth	NA	6,378 km	5.97×10^{24} kg	5.11×10^{8} km^2	1.087×10^{12} km^3
Divide the Sun's value by the Earth's value for comparison	NA				

25. What is the constant balance being maintained in the sun? In other words, why doesn't the sun grow larger or become smaller over time?