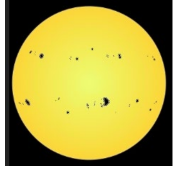
SUNSPOT LAB



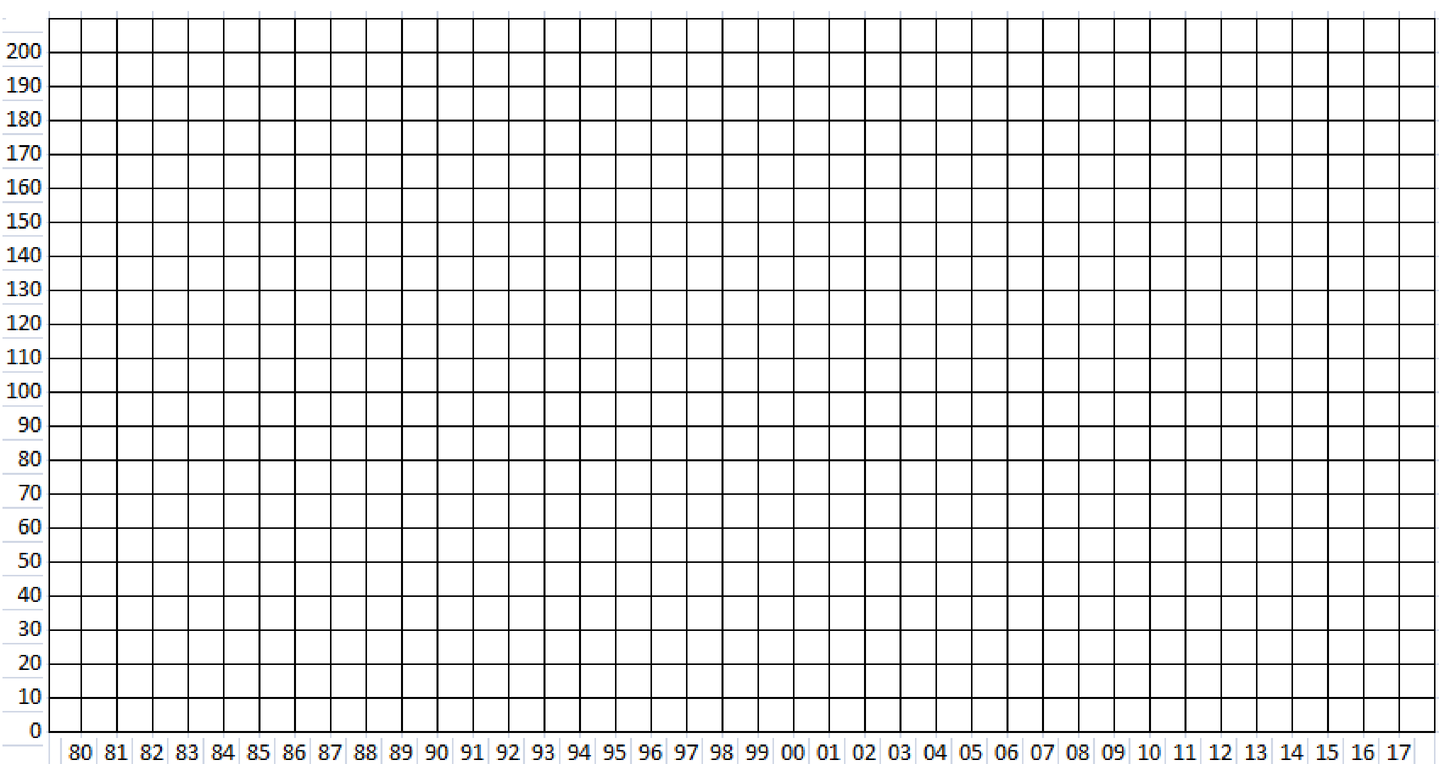
NAME_______________HR____/44

This data table shows the average yearly sunspots from the year 1980 until 2012. Sunspots are dark areas on the sun that are slightly cooler than the surface surrounding them. They are like ticking time bombs. According to NASA, the sunspots' magnetic fields "become unstable and explode, unleashing as much energy as 10 billion hydrogen bombs", and it adds that "no one completely understands" how this occurs. Small explosions outward from these sunspots are called solar flares. Large explosions are called Coronal Mass Ejections, or CMEs. We keep track of sunspots and solar flares because these explosions affect us here on Earth. They can wipe out electricity grids in the North, as well as create interference for airline communication, satellites, TVs, radios, and cell phones. Some can also release dangerous levels of radiation, especially for astronauts. One positive thing these explosions create occurs when the exploded sun particles interact with the ionosphere. They create a beautiful light show called the Aurora Borealis (Northern Lights) or Aurora Australis (Southern Lights).

Did the scientists find a pattern for the sunspots? Is there a pattern for the number or location of spots?
HYPOTHESIS: I think…____

Plot the number of sunspots each year on the graph below. Use a ruler to connect the dots, label the y axis and the x axis, and give a good title to your graph. (10 pts)

1992	170	1999	30	2006	40	2013	110	2020	5	2027	
1993	160	2000	50	2007	20	2014	114	2021	13	2028	
1994	140	2001	80	2008	15	2015	70	2022	113	2029	
1995	135	2002	150	2009	10	2016	50	2023		2030	
1996	70	2003	153	2010	40	2017	30	2024		2031	
1997	20	2004	150	2011	80	2018	20	2025		2032	
1998	10	2005	90	2012	110	2019	15	2026		2033	



1. Study the graph to find a pattern. How many years pass between the highest amounts of sunspots?

2. Scientists use the terms "sunspot maximum" and "sunspot minimum" to describe portions of this graph. During which years do you think we were at sunspot maximum? (3PTS)

3. During which years were we at sunspot minimum? (3PTS)

4. Make predictions for the number of spots in the future. Fill in the data table with your predictions. In what year will there be another sunspot maximum?

5. Fill in the blanks: A good title for this graph would be "The Sun's _____ year cycle of ___________" (2PTS)

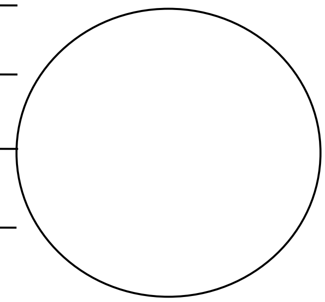
6. During which years did we have the greatest possibility for cell phone interference? (3PTS)

7. During which years were we more likely to see the northern lights? (3PTS)

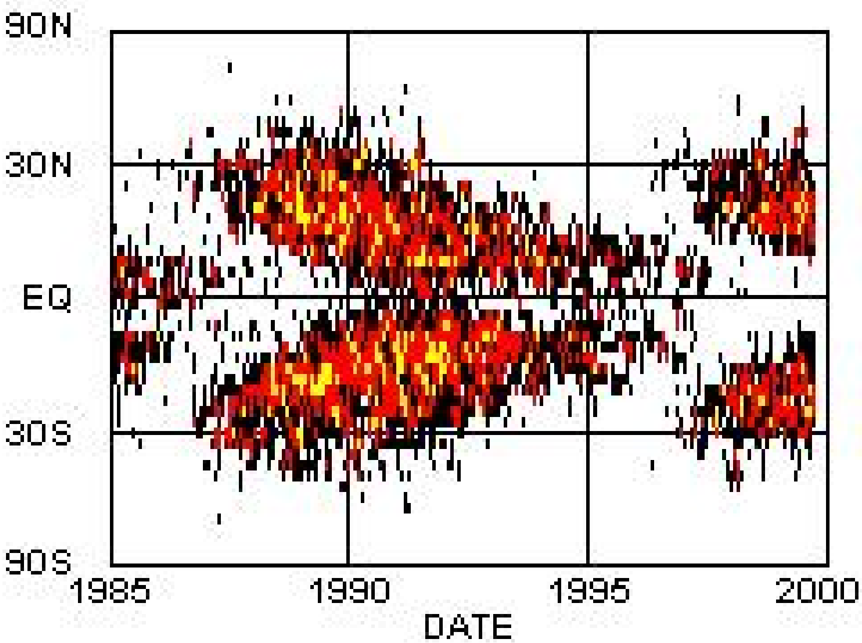
8. What is a sunspot? Define and draw to the right (2PTS)

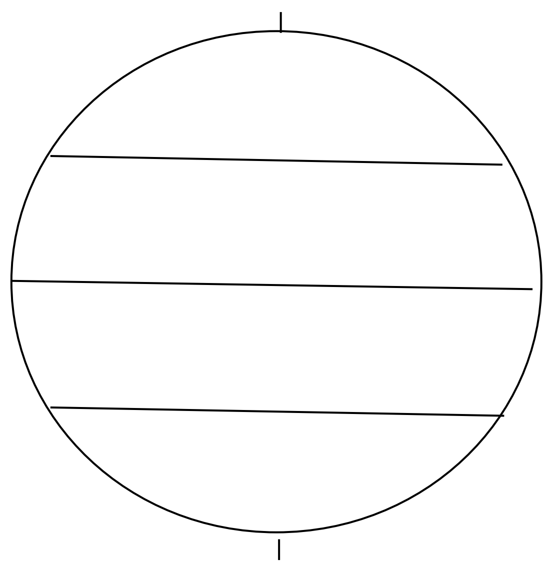
9. What is a solar flare? Define and draw to the right (2PTS)

10. What is a CME? Define and draw to the right (2PTS)



Look at this graph of sunspots. It shows the LOCATION where sunspots appear on the Sun.





11. What does the Y axis represent? Label it on the graph. (2pts)

12. What does EQ mean? Draw and label on the sphere to the right. (2pts)

13. What does 90 N mean? Draw and label on the sphere to the right. (2pts)

14. Where is 30N on the sun? Draw and label on the sphere to the right. (2pts)

15. As sunspots kept occurring from 1990 to 1995, what trend do you see in WHERE they occur?

16. What is the CONCLUSION for this experiment? Use EVIDENCE from the experiment to prove your answer. (2PTS)