Name:_____

Sunspot Analysis Activity

Introduction: Photographs of the sun show dark areas on its surface which are believed to be due to magnetic storms that take place within the sun. These spots are actually very bright, however they appear darker than the surrounding areas on the Sun because they are cooler. The number and pattern of these spots change with time.

When the data collected over many of years are graphed, a pattern emerges. This picture-like representation makes it easier to see relationships that are not obvious from a column of numbers.

Procedure:

1. Create a graph on the graph paper provided in which the independent variable is plotted on the x-axis and the dependent variable is plotted on the y-axis. Be sure to label your axes and include a title.
2. Using the data given, graph the number of sunspots in the years from 1980 to 2016.

Average Annual Sunspot Numbers

Year	Number of Sunspots	Year	Number of Sunspots
1980	146	2000	120
1981	134	2001	111
1982	116	2002	104
1983	72	2003	64
1984	46	2004	44
1985	18	2005	38
1986	13	2006	20
1987	29	2007	18
1988	50	2008	10
1989	145	2009	4
1990	155	2010	24
1991	150	2011	80
1992	94	2012	84
1993	55	2013	94
1994	30	2014	113
1995	18	2015	70
1996	7	2016	39
1997	21	2017	?
1998	64	2018	?
1999	93	2019	?

Analysis Questions

1. Each peak (highest # of sunspots) on the graph represents a sunspot maximum. In which years do these maxima occur? (Hint – You are looking for the highest point before it goes back down)

2. According to the data graphed, during which year did the last maximum occur?

3. What is the average time span between maxima? ***Round to the nearest tenth place***. Show all work.

4. What is the average time span between minimum? ***Round to the nearest tenth place***. Show all work.

5. Predict when the next minimum will occur after the last one plotted on your graph. Use your answer to question 5 to assist you on this question. Show all work.

6. Predict when the next maximum will occur after the last one plotted on your graph. Use your answer to question 4 to assist you on this question. Show all work.

7. Extrapolate (predict using data) your data at its present rate to determine approximately how many sunspots will occur in the year that you will graduate from high school. **Show and explain all.**

8. There does appear to be about a decade or 11 years between each solar maximum on average. See if you can find another larger pattern that might be happening?