NAME:____________________________________ DATE: ___________

The "Freckles"

Of the Sun

Vocabulary:

cyclic: ____

maxima: ____

‘

minima: ____

extrapolate: ____

Pre-Lab Questions:

1. In general, what is the main difference between a cyclic and non-cyclic change?

2. How is it possible for some changes to appear non-cyclic when they are actually cyclic?

3. List 3 examples of cyclic changes that we **<u>HAVEN'T</u>** talked about in class
(The cyclic changes that you list do not have to be science-related.)

   1.

   2.

   3.

The "Freckles"

Of the Sun

INTRODUCTION:

Sunspots are regions on the solar surface that appear dark because they are cooler than the surrounding photosphere (surface of the Sun), typically by about 1500 K (thus, they are still at a temperature of about 4500 K, but this is cool compared to the rest of the photosphere). They are only dark in a relative sense; a sunspot removed from the bright background of the Sun would glow quite brightly.

OBJECTIVE:

You will see how graphing a natural phenomenon can help with the prediction of future events.

PROCEDURE:

1. Using the data provided, graph the data for sunspot activity from 1961-2010.
2. Completely label the graph (label axes with units and make an appropriate title

DATA

AVERAGE ANNUAL SUNSPOT NUMBERS

YEAR	# OF SUNSPOTS	YEAR	# OF SUNSPOTS
1961	54	1986	13
1962	38	1987	29
1963	28	1988	50
1964	10	1989	145
1965	15	1990	155
1966	47	1991	140
1967	94	1992	112
1968	106	1993	55
1969	105	1994	31
1970	105	1995	18
1971	69	1996	8
1972	67	1997	20
1973	38	1998	54
1974	34	1999	96
1975	16	2000	123
1976	13	2001	124
1977	27	2002	103
1978	93	2003	65
1979	155	2004	43
1980	146	2005	30
1981	134	2006	15
1982	116	2007	23
1983	72	2008	35
1984	46	2009	44
1985	18	2010	56

SUMMARY QUESTIONS: *(Answer in complete sentences … remember that it is -3 for each answer that is not …)*

1. What kind of relationship does this graph illustrate between time and sunspot activity?

2. In which years did a sunspot maxima occur? (maxima is plural…)

3. What is the average time (to the nearest tenth of a year) between maxima?
   (Show work to support your calculation.)

4. In which years did a sunspot minima occur? (minima is also plural…)

5. What is the average time (to the nearest tenth of a year) between minima?
   (Show work to support your calculation.)

6. What is the most recent maxima indicated on this graph?

7. Using your answers from question 3 and 6, determine the year that the next maxima occurred.
   (Show the work that led to your answer.)

8. Using the data, make a logical estimate of the number of sunspots that will be observed in the year you graduate high school? Explain how you came up with your answer.