

PROLOGUE

LAB P-2: SUNSPOT ANALYSIS

INTRODUCTION: Photographs of the sun show dark areas on its surface. These spots are believed to be due to solar storms, areas of cooler gases on the surface. The number and pattern of these spots change with time.

When the data collected over many 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.

OBJECTIVE: You will see how graphing a natural phenomenon can aid in predicting future events.

VOCABULARY:

event:

frame of reference:

time scale:

independent variable:

dependent variable:

predictable:

cyclic:

extrapolate:

PROCEDURE:

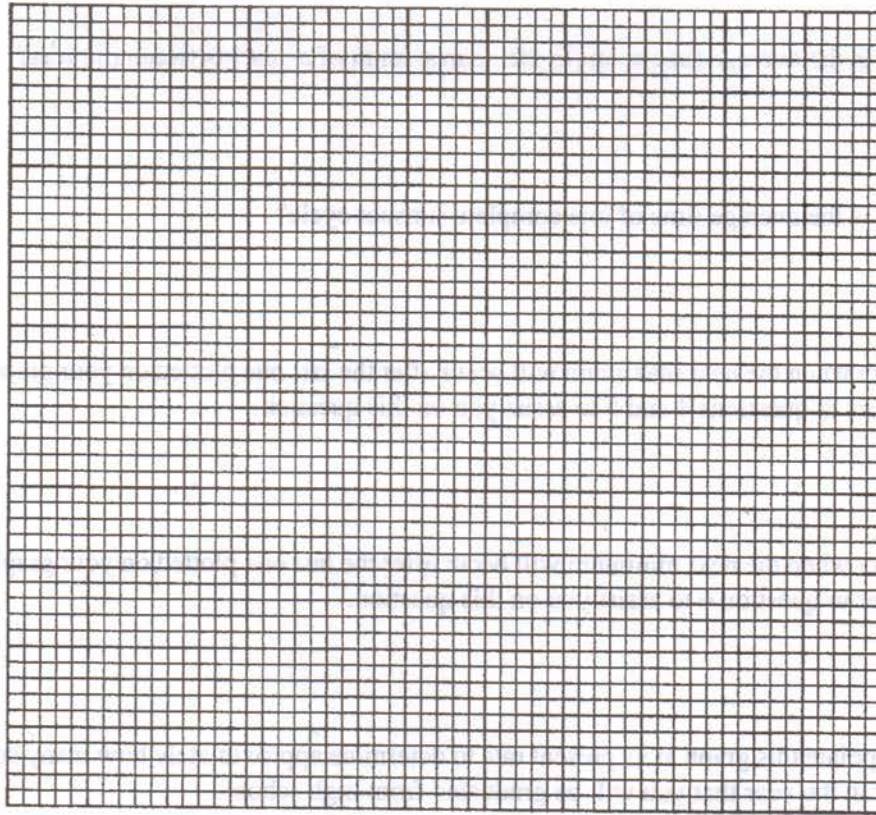
1. Using the data given, graph the number of sunspots in the years from 1950 to 2004.
2. Be sure to completely label each graph axis.

DATA PAGE

AVERAGE ANNUAL SUNSPOT NUMBERS

YEAR	NUMBER OF SUNSPOTS	YEAR	NUMBER OF SUNSPOTS
1950	84	1978	93
1951	69	1979	155
1952	30	1980	146
1953	13	1981	134
1954	4	1982	116
1955	38	1983	72
1956	141	1984	46
1957	176	1985	18
1958	185	1986	13
1959	158	1987	29
1960	112	1988	50
1961	54	1989	145
1962	38	1990	155
1963	28	1991	150
1964	10	1992	94
1965	15	1993	55
1966	47	1994	30
1967	94	1995	18
1968	106	1996	7
1969	105	1997	21
1970	105	1998	64
1971	67	1999	93
1972	69	2000	120
1973	38	2001	111
1974	34	2002	104
1975	16	2003	64
1976	13	2004	44 (est)
1977	27		

DATA PAGE
AVERAGE ANNUAL SUNSPOT NUMBERS



DISCUSSION QUESTIONS: (*Answer in Complete Sentences*)

1. Describe the pattern shown on this graph.
2. On this graph, which quantity is the dependent variable?
3. Each peak on the graph represents a sunspot maximum. In which years do these maxima occur?
4. According to the data graphed, during which year did the last maximum occur?

5. What is the average time span (to the nearest tenth of a year) between maxima?
6. What is the average time span (to the nearest tenth of a year) between minima?
7. What is the average time of one complete sunspot cycle?
8. Predict when the next maximum will occur after the last one plotted on your graph. Use your answers to questions 4 and 5 to assist you on this question.
9. Predict when the next minimum will occur after the last one plotted on your graph. Use your answer to question 6 to assist you on this question.
10. Extrapolate this graph at its present rate to determine approximately how many sunspots will occur in the year that you will be graduated from high school.

CONCLUSION: How does graphing show us that some natural phenomena may be predictable?