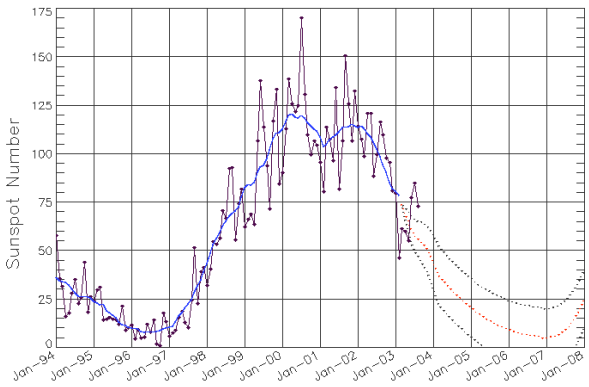
Sunspot cycles

The Sun is an active star that goes through cycles of high and low activity. Scientists mark these changes by counting sunspots. The numbers of spots increase and decrease about every 11 years in what scientists call the Sunspot Cycle.

This activity will let you investigate how many years typically elapse between the sunspot cycles. Is the cycle really, exactly 11-years long?



The sunspot cycle between 1994 and 2008

Scientists study many phenomena that run in cycles. The Sun provides a number of such 'natural rhythms' in the solar system.

- Sequences of numbers often have maximum and minimum values that re-occur periodically.

Here's how to do it!

Consider the following measurements taken every 5 minutes:

100, 200, 300, 200, 100, 200, 300, 200

1. **There are two maxima (value '300').**
2. **The maxima are separated by 4 intervals.**
3. **The cycle has a period of 4 x 5 = 20 minutes.**
4. **The pairs of minima (value = 100) are also separated by this same period of time.**

Now you try!

Sunspot Numbers

Solar Maximum | Solar Minimum

Year	Number	Year	Number
2000	125	1996	9
1990	146	1986	14
1980	154	1976	13
1969	106	1964	10
1957	190	1954	4
1947	152	1944	10
1937	114	1933	6
1928	78	1923	6
1917	104	1913	1
1905	63	1901	3
1893	85	1889	6
1883	64	1879	3
1870	170	1867	7

This table gives the sunspot numbers for pairs of maximums and minimums in the sunspot cycle.

1) From the solar maximum data, calculate the number of years between each pair of maxima.

2) From the solar minimum data, calculate the number of years between each pair of minima.

3) What is the average time between solar maxima?

4) What is the average time between solar minima?

5) Combining the answers to #3 and #4, what is the average sunspot cycle length?

More about sunspot cycles: http://image.gsfc.nasa.gov/poetry/educator/Sun79.html