THE SUNSPOT CYCLE

Science Teacher Education Program

Lesson Summary:

Students use the Internet to find recent sunspot numbers and sunspot numbers for dates in the past. Students plot 15-year time spans of sunspot data on a line graph and discover the 11-year sunspot cycle over 269 years.

Objectives:

The student will:
- learn about the 11-year sunspot cycle on the sun;
- plot and analyze data on a line graph;
- identify the solar maximum and solar minimum on a line graph;
- describe the significance of sunspot numbers;
- observe changes in the sunspot cycles over a 269-year timespan; and
- represent, analyze, and use mathematical patterns, relations and functions using methods such as tables, equations and graphs.

GLEs Addressed:

Science
- [5] SA1.2   The student demonstrates an understanding of the processes of science by using quantitative and qualitative observations to create inferences and predictions.
- [6] SA1.2   The student demonstrates an understanding of the processes of science by collaborating to design and conduct simple repeatable investigations.
- [7] SA1.2   The student demonstrates an understanding of the processes of science by collaborating to design and conduct simple repeatable investigations, in order to record, analyze (i.e., range, mean, median, mode), interpret data, and present findings.
- [8] SA1.2   The student demonstrates an understanding of the processes of science by collaborating to design and conduct repeatable investigations, in order to record, analyze (i.e., range, mean, media, mode), interpret data and present findings.
- [8] SD4.1   The student demonstrates an understanding of the theories regarding the origin and evolution of the universe by creating models of the solar system illustrating size, location/position, composition, moons/rings, and conditions.

Math
- [5] S&P-1   The student demonstrates an ability to classify and organize data by designing an investigation and collecting, organizing, or displaying, using appropriate scale, data in real-world problems (e.g., social studies, friends, or school), using bar graphs, tables, charts, diagrams, or line graphs with whole numbers up to 50 (M6.2.1 & M6.2.2).
- [6] S&P-1   The student demonstrates an ability to classify and organize data by [designing an investigation and collecting L], organizing, or displaying, using appropriate scale for data displays (tables, bar graphs, line graphs, or circle graphs), data in real-world problems (e.g., social studies, friends, or school), with whole numbers up to100 (M6.2.1 & M6.2.2).
- [7] S&P-1   The student demonstrates an ability to classify and organize data by collecting, displaying, organizing, or explaining the classification of data in real-world problems (e.g., science or humanities, peers or community), using circle graphs, frequency distributions, stem and leaf, [or scatter plots L] with appropriate scale (M6.3.1).
- [6] S&P-3   The student demonstrates an ability to analyze data (comparing, explaining, interpreting, evaluating; drawing or justifying conclusions) by using mean, median, mode, or range (M6.2.3).
- [7] S&P-3   The student demonstrates an ability to analyze data (comparing, explaining, interpreting, evaluating, making predictions; drawing or justifying conclusions) by determining mean, median, mode, or range (M6.3.3).
- [7] PS-5   The student demonstrates the ability to apply mathematical skills and processes across the content strands by using real-world contexts such as science, humanities, peers, and community (M10.3.1 & M10.3.2).
- [8] PS-5   The student demonstrates the ability to apply mathematical skills and processes across the content strands by using real-world contexts such as science, humanities, peers, community, and careers (M10.3.1 & M10.4.2).

Search Terms:

sunspots, sunspot cycle, solar maximum, solar minimum, mathematics, graph, Johann Rudolph Wolf