Solarscapes

Answer Key

Activity 1: Features of the Sun

No Question and Answer section.

Activity 2: Sunspot Number Variations

1. Approximately 11 years.

2. & 3. Answers will vary. Students should use the pattern made by their graphs, including the 11 year average variation between both the sunspot maximum and sunspot minimum, to predict the shape of future cycles. Add 11 years to the last minimum to predict the next minimum. Add 11 years to the last minimum to predict the next minimum; add 11 years to the last maximum to predict the next maximum. More sophisticated predictions take into account the shape of each cycle as well as long term trends.

4. Answers will vary.

5. Accept any reasonable answers.

A. Number of sunspots in maxima seems to be increasing.
B. Sharper rise than decline in the slope of most cycles.
C. Spikes of rising sunspot numbers appear on the declining side of some cycles.
D. An undulating pattern of sunspot maxima (pattern within a pattern).
E. Double peaks.
F. The number of sunspots in each maximum appears to be increasing. (Is this a pattern or a result of better data collecting techniques?)

6. Data over a short period may be a temporary anomaly. Example: Global Warming could be a relatively short term trend.

7. Answers will vary.

8. Students should use their graphs to determine the maximum number of sunspots for each cycle in their prediction.

9. Answers will vary.

Activity 3: Determining the Rate of Rotation and Period of Rotation

1. To find the period of rotation, locate a distinguishing feature on the globe. As the globe spins on its axis, time (in Earth hours) how long it takes for the feature to reappear. This is its rotational period. To find the rate of rotation, divide the number of times the feature reappears by the time in Earth hours.

2. Answers will vary.

3. Yes, estimating the rate of rotation would be difficult if there were no visible features that were permanent enough to count as the planet rotates on it's axis. (Some objects, not planets, may spin so reapidly that it is impossible to observe a feature.)

Activity 4: The Sun's Period of Rotation

1. Rotation

2. Answers will vary. Observations indicate that the Sun's equatorial regions rotate around its axis every 25 days, while the areas around its poles may take as long as 33 days.

3. No, since the amount of time for the feature to reappear would change because of changes in latitude as well as in longitude.

4. Answers will vary. Students should summarize their procedure and discuss what more they would like to learn about the Sun.