

Surface Geology of Mars

2005 Science Olympiad Exam

Compute This!

Background

Over the past several years, three lunar rovers have been dropped onto the surface of Mars to analyze rock and soil composition, photograph features, take temperature and wind speed readings, etc. Sojourner was the first, followed by Spirit and Opportunity. One of Sojourner's most publicized achievements was its study of two rocks, dubbed Barnacle Bill and Yogi, both captured within the same image.

Graphical Problem

Sojourner conducted a thorough analysis of two Martian rocks, dubbed Barnacle Bill (A-3) and Yogi (A-7). Your tasks are twofold: (1) to search only official NASA sites for answers to three questions, type your responses to those questions, and copy and paste the URLs of the sites where the responses were found into an MS Word document that can readily be opened by event supervisors for evaluation and (2) search for the results of Sojourner's analyses of Barnacle Bill's and Yogi's compositions, record those results onto an MS Excel spreadsheet, and create a bar graph to display each rock's mineral composition. Be certain to place an appropriate title above your graph and a legend to the right or left indicating which color represents each element and the percentage of each element contained within these rocks.

Short Answer Questions

Research and record your response and associated URL to each of the following questions in an MS Word document. Only official NASA web sites are permissible sources of information. Responses need not be written in complete sentences. The same URL may be recorded if answers to more than one question are found on the same site.

1. Which Martian rover explored Gusev Crater?
2. Why are planetary geologists interested in regions of the Martian surface where mineral deposits of hematite may be found?
3. What information will the Alpha Particle X-Ray Spectrometer, mounted onto the rovers, provide?

General Instructions

1. Please place your school name and team number at the top of your Excel and Word files.
2. Save your work regularly throughout the event.
3. Your Excel file should include both a spreadsheet data table and a pie chart as described above.
4. Your Word file should include only the answers and URLs for each of the three questions.