INTERACTIVE MAPPING OF THE PLANETS USING THE GOOGLE EARTH PLATFORM. A. M. Gilbert[1], G. R. Osinski[1], T. N. Harrison[1], M. Mader[1], A. Nuhn[1], B. Shankar[1], and L. L. Tornabene[1]. [1]Centre for Planetary Science and Exploration/Dept. Earth Sciences, Western University, London, ON, N6A 5B7 Canada (cpsxoutreach@uwo.ca)

Introduction: The Centre for Planetary Science and Exploration (CPSX) at Western University in London, Ontario, has developed a strong education and outreach program over the past four years. In the 2011-2012 academic year, the program reached over 13,000 students, teachers, and members of the public with our traditional, face-to-face programming, and thousands more with our radio program (Western Worlds: cpsx.ca/westernworlds) and media appearances. Current presentations and activities can be viewed here: cpsx.ca/outreach.

With funding from Canada's Natural Sciences and Engineering Research Council (NSERC) PromoScience program and support from the Department of Earth Sciences at Western University, the CPSX is developing a new initiative called Interactive Mapping of the Planets (IMAPS), which consists of inquiry-based workshops, a week-long summer camp, pre-prepared lending kits, and centered on a web-based activity.

Approach: The IMAPS program consists of four components:

Inquiry-based activities. The first inquiry activity developed for the IMAPS program focuses on searching for evidence of past water flow on Mars. Students learn about the similarities and differences of the surfaces of Mars and Earth, make observations and inferences about different land features, build basic mapping skills, and determine what types of landforms indicate evidence for past water flow. Using the SmarterScience (www.smarterscience.ca) RAFT model (Role, Audience, Format, Topic), students act as scientists and use Google Mars and easily accessible online databases for HiRISE and CTX (both cameras on the Mars Reconnaissance Orbiter) to search for evidence of past water flow and to choose the best landing site for the next rover.

The students present and defend their report to the "space agency". Reports are submitted in many forms, such as posters, oral presentations, videos, and glogs (www.glogster.com - see Figure 1 as an example), and are evaluated based on the students understanding of image scale, geospatial information, building the geological history of the landing site, and rationale for choice of landing site.

Future inquiry-based activities will have students investigate the lunar landscape and compare craters on Earth to those on the Moon and Mars.

Summer camps. The week-long summer camp is offered to youth of 8 to 11 years of age in London, Ontario, and surrounding area, in association with the well-developed Sports Western summer camps. Topics covered during the camp include size and scale of the solar system, telescopes, meteorites, Mars rovers, and analogue missions. The camp was offered twice during the summer of 2012, and was well received and over-subscribed. After receiving much positive feedback from students, parents, and camp staff, the camp will be offered for four weeks in the summer of 2013.

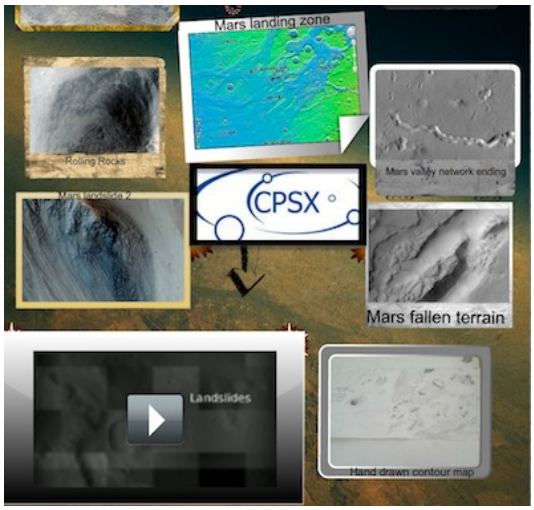

Figure 1: Example glog report submission, including images and videos of the chosen landing site from Google Mars, HiRISE, and CTX.

Rock kits. The pre-prepared kits consist of impact rocks, meteorites, 3D crater models, and an information package. After in-class testing, they will be made available to teachers in rural and remote areas who would not normally have access to similar workshops and/or expertise. Figure 2 shows an example rock kit consisting of many types of impact rocks.

Figure 2: Example impact rock kit containing a variety of impact breccias and melt rocks.

Web-based activity: The web-based activity is in development stages. The general objective will be for participants to choose a landing site on Mars and plan a traverse based on a given mission goal (Figure 3). This activity could be done as an extension of the inquiry-based workshop or as a stand-alone activity.

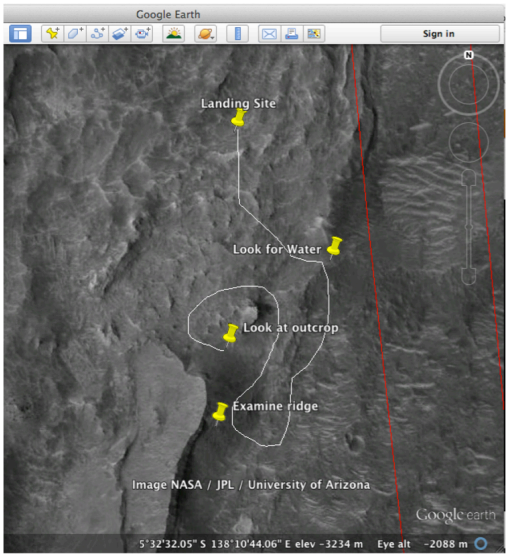

Figure 3: Example of planned traverse using Google Mars.

Each participant will receive image training analysis via the web portal, where he or she will learn about the different landforms on Mars and which ones are potentially caused by water flow. Before being able to continue with the activity, they will need to pass a short test to show they can consistently identify certain land features. Participants will then receive a Google Mars tutorial and can go on to plan their landing site, mission, and traverse. Evaluation will be done one of two ways: for classrooms, teachers will receive the final traverses and they can evaluate them based on pre-determined criteria. For the general public, evaluation will be done using a crowd-sourcing method. The web-based activity will be easily scalable to include Google Moon and potentially Google Earth.

Partnerships: The IMAPS activities are developed in partnerships with the Department of Earth Sciences at Western University, Sports Western, the Thames Valley District School Board, and Dimentians Web Marketing and Design. We are continually looking for new collaborators to help design or test our inquiry- and web-based activities, provide feedback on our programs, or volunteer with us.

Acknowledgements: Funding from the Natural Sciences and Engineering Research Council PromoScience program and Western University has made the IMAPS initiative possible. We thank Alaura Singleton and Andy Forest for their contributions to the IMAPS project. We also thank Ryan Dunne and Colleen Ellison-Wareing, teachers in the Thames Valley District School Board, who allowed us to test the first IMAPS inquiry activity in their classrooms.