CETLA'S
TEACHING WITH TECHNOLOGY AWARD GUEST LECTURE

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How can I bring these experiences to my students?

source: American Biology Teacher, Vol. 78, No. 5, p. 404-409
Exploration of the Moon and Asteroids by Secondary Students (ExMASS)

The Exploration of the Moon and Asteroids by Secondary Students (ExMASS) program is managed by the Center for Lunar Science and Exploration (CLSE), one of nine teams with the NASA Solar System Exploration Research Virtual Institute (SSERVI). ExMASS is an academic year-long, national standards-based lunar/asteroid research program that envelops students in the process of science. Working alongside their teachers and a scientist advisor, students undertake authentic, open-inquiry research projects that engage them in the process of science. At the end of the year, student research is reviewed by a panel of scientists. The top four teams present their research to this panel of scientists, competing for a chance to present their work at the Exploration Science Forum held at the NASA Ames Research Center in the summer.
How does this translate into Science Education at Howard?
The Howard Classroom
Elementary Pre-service Science Education
Enhancing special learning/Engineering Design Challenges
What is the Mars Student Imaging Project?

MSIP: Welcome to the Mars Student Imaging Project

The Mars Student Imaging Project (MSIP) is a nationally recognized award winning authentic inquiry-based learning and student-centered education project. Students learn how science works by engaging in science research using data from a NASA spacecraft orbiting Mars. Students understand how science really works by actually being a scientist.

The Mars Student Imaging Project (MSIP) is an immersive and transformational way for students in grades 5 through early college to engage in scientific process and practices through authentic research experiences. MSIP enhances the teaching of traditional courses, such as physical science, Earth science, chemistry, and biology. MSIP also incorporates 21st Century Skills to help students be ready for the STEM workforce.

MSIP can be done through distance learning or as an independent research project. There is no fee to participate in the Mars Student Imaging Project.
MSIP activities align to the National Science Education Standards as well as build essential 21st Century Workforce Development Skills. The MSIP resources included on this page provide educators and student teams with the necessary information needed to complete the project.

The project is completed in six steps or phases: Planning Guides, Mars Image Analysis, Question Mars, Proposal Phase, Targeting, and the Final Report. MSIP teams will learn more about these phases as they progress through the project. For MSIP teams that are working on the project as the on-site or distance learning formats they will be working with a ASU Mars Education MSIP Coordinator. The MSIP Coordinator will walk MSIP teams through these phases of the project to ensure successful classroom implementation. The MSIP activity format chosen may also have an effect on how these steps are incorporated throughout the project.

Please be sure to contact an MSIP Coordinator if you are new to the project and have questions about these six steps.

1. Planning Guides - Creating the MSIP Schedule
2. Mars Image Analysis - Learn About the Red Planet
3. Question Mars - Developing the Research Question
4. Proposal - Developing the Research Plan
5. Targeting - Imaging Mars
6. Final Report - Peer Review Symposium and Technical Reporting
What is JMARS?

The JMARS user interface consists of one window with two sections: the Layer Manager (on the left-hand side) and the Viewing Window (the larger window on the right-hand side).

The Layer Manager controls the datasets and analysis tools (called layers) that are loaded into the current session of JMARS. Layers can have various options and parameters, which are controlled by the focus panel associated with each layer. The focus panels can be accessed by double-clicking on the appropriate layer in the Layer Manager.

The Viewing Window displays the visual data associated with the layers loaded in the Layer Manager. This approach allows JMARS to display multiple layers with varying opacities at the same time. The layers, which users can think of as being "stacked" on top of each other, are displayed in the Viewing Window in bottom-to-top order. The order and the transparency of the layers can be adjusted in the Layer Manager.

Image source: https://jmars.mars.asu.edu
Which regions should we explore?

Final Research Question: How does elevation and distribution of volcanoes affect the emission of gases and particles?
Final Hypothesis: The higher prevalence of volcanoes in an area increases the volcanic fog and prevalence of chemicals.
MOLA
Mars Orbiter Laser Altimeter

How Can We Use It?

- Context Images
  Seeing the surroundings of a THEMIS VIS or CTX image will help you interpret what you see in the image.

- Elevations
  Warmer Colors = Higher Elevations
  Cooler Colors = Lower Elevations