



Mission To Mars

A Pre-Visit Information Guide for Teachers

Meets Rhode Island Grade Span Expectations:
ESS2(5-8)MAS-6, ESS1(7-8)-3, ET2.1(7-8), ET2.3(7-8)

The rocks and soil of Mars hold many clues to the planet's history. Students will explore the astonishing robotic spacecraft that are exploring the answers to our questions about Mars, and will have to think like NASA engineers in a design challenge to build a soil scoop for testing the rusty Martian soil.

OBJECTIVES

- **Martian Geology:**
Students will explore the geology and surface features of Mars, and find out how they hold clues into the planet's past. Today Mars is a cold, dry desert world. However, surface features, rocks, and soil hint at a formerly volatile world where volcanoes raged, meteors plowed deep craters, and flashfloods rushed over the land.
- **The Martian Environment:**
Did you know that Mars has seasons, polar ice caps, and even a thin atmosphere? Students will learn about the similarities and differences between Mars and Earth, and discuss the potential of Mars to support life. Might life be able to survive in the Martian soil? Many spacecraft are trying to find out . . .
- **Martian Spacecraft Engineering Challenge:**
Students will discover the spacecraft that have explored Mars and searched for signs of life in its soil. Students will then have to think like NASA engineers in a design challenge to build a soil scoop instrument, similar to the robotic arm of the Phoenix spacecraft. Students will experience firsthand the challenges and rewards of engineering and design, discovering how technology enables us to explore our universe.

ACTIVITIES

Teachers are encouraged to conduct pre-visit and post-visit classroom discussions and activities with their classes to make the most of their experience. This online quest allows students to compare Mars and Earth, look for rover landing sites, and more:

<http://www.marsquestonline.org/resources/familyguide/index.html>. Students may want to make a chart comparing Mars and Earth, noting characteristics that are common to them, and ways in which they differ. Why can life survive so much more easily here on Earth than on Mars?

HELPFUL VOCABULARY

Atmosphere – A layer of gases that surrounds a celestial body.

Ice Cap – An extensive perennial layer of ice or snow that covers a large area, especially of land.

Impact crater – An impact crater is a round depression in the surface of a planet, moon, or other rocky object made by a collision with a smaller object such as a meteorite.

Mars Phoenix Lander – The most recent addition to the group of functioning spacecraft currently on Mars, the Phoenix is a lander exploring the history of water and searching for environments hospitable for microbial life on Mars.

Microorganism – Any organism too small to be seen without magnification, such as a bacteria, protozoa, or some fungi and algae.

Rille – A rille is a long, narrow depression in the Martian surface created by lava flows, or the collapse of the surface along lava tubes or fault lines.

Robotic Arm – An instrument on many rovers and spacecraft that can lift and manipulate rocks or soil for testing.

Rover – A type of space exploration vehicle that moves across the surface of a celestial body.

WEBSITES

Mars Phoenix Mission Home:
<http://phoenix.lpl.arizona.edu/>

NASA Mars Science Laboratory Home:
<http://marsprogram.jpl.nasa.gov/msl/>

Google Mars Site (Like Google Earth)
<http://www.google.com/mars/>