

MISSION TO MARS

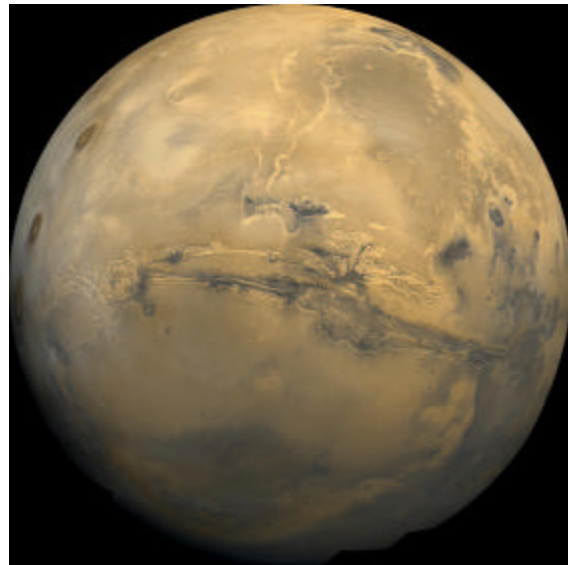
PROJECT BASED LEARNING



Mars Geography:

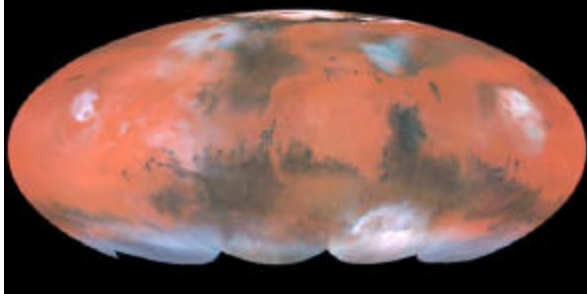
By: Elisabeth Ambrose

Like Earth, the surface of Mars has many kinds of landforms. Some of Mars' spectacular features include Olympus Mons, the largest mountain in the Solar System. The Tharsis Bulge is a huge bulge on the Martian surface that is about 4000 km across and 10 km high. The Hellas Planitia is an impact crater in the southern hemisphere over 6 km deep and 2000 km in diameter. And the Valles Marineris, the dark gash in Mars' surface shown in the picture below, is a system of canyons 4000 km long and from 2 to 7 km deep.

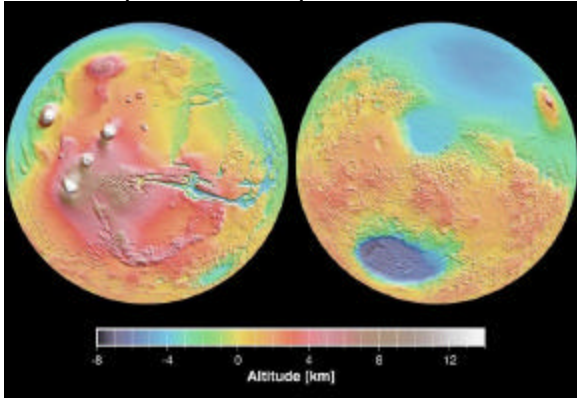


Mars, taken by the Hubble Space Telescope. NASA/JPL.

The white patches in the map of the Martian surface shown below are clouds and storms in Mars' atmosphere.

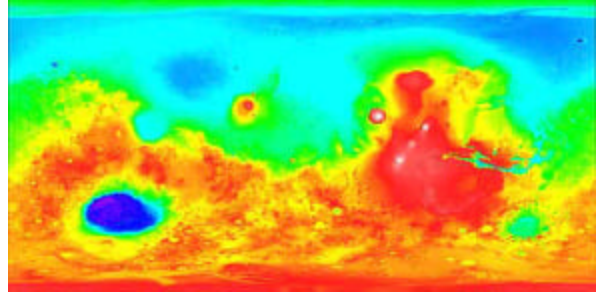


Mars with clouds and storms, taken by the Hubble Space Telescope. NASA/JPL.



Martian Topography. NASA/JPL.

This is a map of Martian topography. In the left image, the Tharsis Bulge can be seen in red and white. The Valles Marineris is the long blue gash through the middle. In the right image, the blue spot is the Hellas impact basin. Craters can also be seen in the right image.



Mars Topography. NASA/JPL.

This image is a flat map of Mars, made from data from an instrument aboard the Mars Global Surveyor. There are striking differences between the northern and southern hemispheres. The northern hemisphere (top) is relatively young lowlands. It is about 2 billion years old. The southern hemisphere (bottom) consists of ancient and heavily cratered highlands, much like the surface of the Moon. It is about 4 billion years old. There is a very clean boundary between the two regions, although the reason for this sharp break is unknown. It might be due to a very large impact that occurred just after the planet's formation. The Hellas impact basin is visible as the bright blue region on the left side of the image. The

Tharsis Bulge is the bright red region on the right side. It is interesting to note that these two features are located on exact opposite sides of the planet from each other. Olympus Mons is the white spot to the left of the Tharsis Bulge.

The Benchmark Lessons were developed with the help of the following sources:

Bill Arnet's "The Nine Planets" website, <http://nineplanets.org>

Chaisson, Eric, and McMillan, Steve. *Astronomy Today*. Prentice Hall, Upper Saddle River, New Jersey, 1999.

JPL's Planetary Photojournal, <http://photojournal.jpl.nasa.gov/>

Mars Pathfinder Science Results Directory,
<http://mars.jpl.nasa.gov/MPF/science/science-index.html>

The NASA Image Exchange, <http://nix.nasa.gov/>

Zeilik, Michael, Gregory, Stephen A., and Smith, Elske v. P. *Introductory Astronomy and Astrophysics*. Saunders College Publishing, Harcourt Brace Jovanovich C College Publishers, Austin, 1992.

Mission to Mars: Project Based Learning: Dr. Anthony Petrosino, Department of Curriculum and Instruction, College of Education, University of Texas at Austin,

<http://www.edb.utexas.edu/missiontomars/index.html>

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