

Home and Away: Comparing Mars and Earth

Part Two

Purpose

The purpose of this activity is to gain a greater understanding of both Mars and Earth, through comparison/contrast. Students will develop communication skills, as well as creative arts skills.

Students will be able to

1. Recognize both Mars and Earth, and note specific, defining characteristics of each.

Important Vocabulary (key terms in bold)

Mars	Earth	weather	temperature	atmosphere
climate	humidity	wind speed	water	terrain
blueberries	ozone	seasons	gravity	geology
barometric pressure	plate tectonics	erosion		

Brainstorming Exercise: KWL Chart

Continue filling in the KWL Chart as necessary.

The Geology of Mars and Earth

There are a number of lesson plans available online regarding the geology of Mars. One place to begin is at DiscoverSchool.com, specifically the “Path to Mars” lesson created by physics teacher Ted Latham (<http://school.discovery.com/lessonplans/programs/thepathtomars/>). Other helpful resources relating to this topic are also available:

PRINT MATERIALS

1. Boyce, Joseph M. The Smithsonian Book of Mars. Washington: Smithsonian Inst. Press, 2002. 321 pp, ISBN 1560988479.
2. Hartmann, William. A Traveler's Guide to Mars: The Mysterious Landscapes of the Red Planet, Workman Publishing, 2003, 468 pp, ISBN 0761126066 .
3. Nature Insight special issue on Mars, vol. 412, 6843, pp 207-253, 12 July 2001.
4. Head, James W. et al, "Recent Ice Ages on Mars", Nature 426, pp. 797-802, 18/25 December 2003.

ONLINE RESOURCES

1. Leonard David's article “Modern Mars: Latest Spacecraft Findings Redefine Future Missions” http://space.com/scienceastronomy/modern_mars_040407.html
2. Topographical map of Mars <http://www.earth.man.ac.uk/outreach/index.php?p=4>
3. Information on planetary geology and geological processes <http://ganesh.colorado.edu/astr1110/lect22.pdf>

Be the Weather...Again!

Students use dance/movement to music to express the effects of weather on the terrain of Mars. (Students can choose their own music, but there cannot be any lyrics!) They can perform individually or in small groups. A tape/CD player will be necessary for this activity.

Mars Discussion Points (adapted from

<http://www.wheatonma.edu/Academic/AcademicDept/Astronomy/TBarker120/March21/ClassNotes.html>)

Students discuss/debate ideas and theories about Mars—its physical features, future colonization, etc. Students are provided a list of questions/ideas to encourage discussion. Notes should be taken for future use.

(** See below for activity sheet and key.)

Mars Discussion Points (KEY)

1. Describe two pre-space-age observations of Mars that encouraged people to think that Mars might have life.
 - Linear features thought to be canals of some sort
 - Seasonal changes, resembling those on Earth

2. List some modern observations that do not support the idea that life existed on Mars.
 - Low atmospheric pressure that has not been shown to support liquid water on Mars' surface
 - Extremely cold temperatures
 - No ozone layer
 - No gasses in the atmosphere that could be indicators of life
 - Anything else?

3. Give evidence that suggest that Mars did indeed have liquid water on its surface at one time.
 - Features that resemble river beds
 - 'Blueberries'
 - What else?

4. Mars vs. Earth: Discuss differences and similarities.
 - Location, location, location: the location of Mars in our solar system differs from that of Earth.
 - Size matters: Mars is smaller than Earth.
 - Mars' smaller size causes 'weak gravity,' which results in no ozone layer—it cannot 'grasp' its own atmosphere (unlike Earth).
 - Mars' small size allowed for faster cooling than Earth. This resulted in a lack of 'geological activity' on Mars.
 - Olympus Mons (volcano) is so large because Mars had no plate tectonics—all of the land masses piled up in one place, unlike on Earth where tectonics caused such things to form as the Hawaiian Island chain.
 - What else?

5. List difficulties that Mars' colonists might encounter while attempting to cook pasta or a boiled egg.
 - Firewood, etc. unavailable
 - If wood or another resource was transported with the colonists, a lack of oxygen in the atmosphere would disallow that resource to burn.
 - Water not readily available
 - If water were also transported and used to cook, it immediately change from liquid to gas.
 - Anything else?

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