

Using Images from Mars Rovers *Spirit* and *Opportunity*

Purpose

The purpose of these activities is to gain exposure to the planet Mars, using images returned from the Mars Exploration Rovers *Spirit* and *Opportunity*. Moreover, the purpose is to improve reading comprehension skills, and to encourage creativity in written language.

Students will be able to

1. Read and comprehend text (captions) associated with images returned from the Mars Rovers.
2. Expand their vocabulary set, as it relates to Mars (crossword puzzle).
3. Write a poem using some of the Mars-related vocabulary.

Important Vocabulary/Key Terms (essential terms in bold)

adjective	adverb	verb	noun
Mars	exploration	Meridiani Planum	Gusev Crater
Red Planet	minerals	surface	Adirondack
planet	olivine	erosion	geology
rover	crater	sol	topography

Crossword Puzzle (Vocabulary introduction/reinforcement exercise)

Use the images and captions at <http://marsrovers.jpl.nasa.gov/gallery/> to complete this online crossword puzzle.

Down

1. A _____, like the ones shown in photographs captured on September 24, 2002 and December 5, 2002, functions as a geologist after landing on a planet's surface; Spirit and Opportunity are the most recent of these to land on Mars.
2. Images captured on January 28, 2004 by the Mars Exploration Rover Opportunity show flat and dark terrain at its landing site, which contrasts with images of past landing sites on Mars that show a variation in the _____, the graphic representation of the surface features.
3. Rover Opportunity landed on Mars on January 25, 2004. What is the name of the landing site from which its first images were returned?
4. What is the name of the Mars Exploration Rover Spirit landing site, shown in the image captured at an altitude of 1985 meters, as Spirit descended to Mars?
5. What do scientists think the circular feature is, in images captured on January 25, 2004 as Opportunity descended to its landing site?

Across

1. Opportunity's view of the Martian horizon is captured in images returned on January 31, 2004, the day it rolled off the lander and onto Martian soil. The 31st is the seventh Martian day, or _____, of the mission.
2. Spirit has returned images of soil from Mars. What surprising mineral was detected in the soil patch shown in images returned on January 20, 2004?
3. The planet Mars is often referred to as the _____ because of the color of its soil, which comes from hematite (chief ore of iron) found in it, as shown in Opportunity's images from February 4, 2004.

4. What is the name of the rock seen in the images captured “in approximate true color” by Spirit, on January 19, 2004?
5. A graph captured by the Mössbauer spectrometer attached to Spirit’s ‘arm’ shows the presence of three different iron-bearing _____ in the soil at Gusev Crater (January 20, 2004).

Poem (Using adjectives and adverbs)

Poems are often “textual pictures,” inspiring images in one’s mind. There are many kinds of poetry that achieve this in many different ways. Choose one of the following styles to write your Mars-related poem, and we will post it on our site! If you need help, don’t worry: each style is defined; and there are examples to show you the way!

Cinquain—a five-line poem that uses the following formula:

Line 1 - a one-word title

Line 2 - a two-word phrase that describes the title

Line 3 - a three-word phrase that describes an action relating to the title

Line 4 - a four-word phrase that describes a feeling relating to the title

Line 5 - one word referring back to the title, but is not necessarily the same word

OR

Line 1 - two syllables

Line 2 - four syllables

Line 3 - six syllables

Line 4 - eight syllables

Line 5 - two syllables

Children

Small, bright

Running, laughing, playing

They grace the earth

Posterity

Haiku—three short non-rhyming lines, the first line usually containing five syllables, the second line seven syllables, and the third line five syllables

The far and wide sky

Fat clouds spilling raindrops

In search of puddles

Acrostic—a poem in which the first letter of each line forms a word when you read them top to bottom

*M*y

*O*nly

*M*entor

Free verse—poetry written without proper rules pertaining to form, rhyme, rhythm, meter, etc. In free verse, the writer makes his/her own rules. The writer decides how the poem should look, feel, and sound.