

# Lesson 1: Welcome to Earth and Mars

## Summary

This introduction will expose students to Mars imaging software platforms so that students may become familiar with their navigation and imagery products.

## Learning Goals

### Students will be able to:

- Navigate and use both Google Mars and JMARS.
- Become familiar with imagery collections available (e.g., HiRISE, CRISM, THEMIS) via the above software programs.

## Context for Use

This learning module is meant for adaptation in an introductory earth science course and/or planetary science course. The *In-Class Activities* can be easily adapted for homework when desired.

## Description and Teaching Materials

### *In-Class Activity*

In-Class Activity 1: Mars Analogs

### *Homework/Lab*

Homework 1: Google Mars

Homework 2: Exploring Gale Crater

Homework 3: JMARS- Mawrth Vallis  
“Potential landing site”

Homework 4: Meet the Scientist-  
Who studies Mars?

Homework 5: Having fun with Mars  
programs

## Assessment

- Methods of assessment are within each individual *In-Class Activity* and *Homework*.

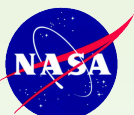
## Teaching Notes and Tips

1. Before assigning Homework 1 or 2 spend some time exploring both Google Mars and JMARS with the students for a “first pass” exposure.

## Mars for Earthlings

### References and Resources

1. Image File: [Welcome to Earth and Mars](#)
2. JMARS Website: <http://jmars.asu.edu/>
3. Google Earth Free download: <http://www.google.com/earth/index.html>



## Mars for Earthlings

### ***In-Class Activity 1***

Intro to Mars\_MFE

*Mars Analogs*

**Purpose:** Observe and rank potential Earth analogs for Mars planetary study.

#### **Preparation:**

1. Print off student exercise
2. Use .ppt image file for class

#### **Resources:**

Intro to Mars Image File

#### **Engage**

What is an analog?

1. What do students think scientists mean by an “earth analog” in the context of studying Mars?
2. As an example, why is the komodo dragon considered an “analog” for a dinosaur?

#### **Explore**

Present the following regions as potential analogs for Mars (via Intro to Mars Image File):

- Atacama Desert
- Death Valley, CA
- John Day Formation, Oregon
- Southern Utah
- Antarctic Dry Valleys

Ask students to consider their criterion for whether or not a region is a good analog. Discuss varying criteria as a class and determine the most appropriate definition of a good analog.

#### **Explain**

Have students investigate “vital statistics” of Mars via the internet (see Image File examples) such as: ambient temperature ranges, atmospheric composition, mineralogy, depositional environment, the absence of life, water, and geomorphic features.

Other example references: <http://nssdc.gsfc.nasa.gov/planetary/factsheet/marsfact.html>

#### **Elaborate**

As students discuss the various regions, have them provide the Earth data/statistics (similar to Mars) of these regions for comparison to Mars.



## Mars for Earthlings

### Evaluate

Check off how important students think the following factors are in deciding whether this is a good analog to Mars (1-very important, 5-not important)

- \_\_\_\_\_ Environment conditions, setting for deposits
- \_\_\_\_\_ Geomorphic features (landscape expression)
- \_\_\_\_\_ Type of water and its presence or absence
- \_\_\_\_\_ Ambient temperature range
- \_\_\_\_\_ Mineralogy
- \_\_\_\_\_ Type of life, if present (extremophile or not)
- \_\_\_\_\_ Rainfall
- \_\_\_\_\_ Atmospheric composition

*Note: it may be difficult for any Earth Analog to satisfy all the conditions of similarity to Mars*

