

Lesson 23: Project Mission to Mars

Summary

This is a collection of documents to prepare and evaluate students for their Project: Mission to Mars.

Learning Goals

Students will be able to:

- practice creating a mission budget
- define mission objectives, supporting science, and background research to substantiate a mission.
- present a mission project presentation before a review board.
- identify mission personnel currently active in NASA / Astrobiology related studies.

Context for Use

This module exposes students to the realities of creating and seeking funding for a mission to Mars in a presentation format. Students use knowledge gained throughout *Mars for Earthlings* to support their work. This lesson serves as a culminating activity which requires understanding of the Martian surface via Earth analog concepts.

Description and Teaching Materials

- Mission Grading Rubric
- Mission Progress Sheets
- Mission Team Evaluation

Teaching Notes and Tips

1. For the review panel, ask other outside teachers/instructors to join the panel so students do not necessarily recognize their reviewers. TA's could be used as well.
2. Students will be most successful in this project after several weeks of interpreting Mars data and relating Earth analog concepts.

3. Encourage students to refer to the "Meet the Scientists" videos for potential personnel.

Assessment

See the Mission Grading Rubric

Mars for Earthlings

References and Resources

Students participate in virtual projects and activities:

<http://mars.jpl.nasa.gov/participate/students/>

Mars Exploration Program Analysis Group (MEPAG):

http://mepag.jpl.nasa.gov/reports/MEPAG%20Goals_Document_2012_v7_2014-09-24.pdf



Mars for Earthlings

Mission to Mars Project

Outline

Example Progress Sheet-1 (To ensure that students don't wait until the last minute to attempt a project, it helps to have an early progress check to make sure they are on track. Students will enjoy having a team name that gives them a little sense of competition.)

Directions: Complete and submit an outline of your Mission to Mars Project. Develop a 3-tier outline in the following format:

Major topic

- a. Who is responsible for this section in your group
 - i. Team Member
 - b. Content
 - i. Relate general information
 - c. Images you will use
1. Use the Mission to Mars Project grading rubric (following this) to determine the minimum amount of slides needed. You must cover every section in your presentation. Each section will be a "Major Topic" in your outline. You may of course include more slides when necessary. Sections are listed below for clarity:
 - a. Mission Objectives
 - b. Mission Team
 - c. Background
 - d. Scientific Merit
 - e. Budget
 - f. Education & Outreach
 - g. Citations
 2. In addition to the outline include at least (4) images, referenced and cited, you plan to use. You may insert the images where covered in your outline or you may simply append the images to the document. Make sure you use figure captions.
 3. For your **Budget** slide make sure you include the amount you are planning on spending and a general break down of the expenditures.

Team Name: _____



Mars for Earthlings

EXAMPLE FINAL PROJECT PARTICIPATION SHEET (Not all students actively participate in the project like they should, so this is a mechanism to help determine who has done the work, and allows students to judge their peers on the project.)

For each name, including your own, give your estimated percentage of effort (out of team 100%) you think each person put in (note: if there are 5 people & it was all equal, everyone would be at 20%)

Your Name _____ % Effort _____

Your Final Project Name _____

Your fellow teammates' names:

A. _____ %Effort _____ B. _____ %Effort _____

C. _____ %Effort _____ D. _____ %Effort _____

Your Team ROLE: _____

What did your task efforts include (what work did YOU personally do for the project)?

Examples could be: investigated Curiosity instrumentation to determine the necessary instruments for your mission; investigated potential landing sites; writing up a percentage of the final project report, putting together a percentage of the PowerPoint presentation, etc.

Estimate the # of hours you actually spent performing the different tasks.

_____ Hours _____

TOTAL HOURS _____

Grade you think you deserve for this final project _____

Explain why _____



Mars for Earthlings

Mission to Mars Project Rubric (Example of how you'll be graded)

Team Name: _____

Reviewer: _____

Task (% possible)	Strengths	Weaknesses	%
<u>Mission Team</u> (10) <ul style="list-style-type: none"> • role of each member • (2) current NASA engineers/scientists • Partner Agency 			
<u>Presentation Clarity</u> (5) <ul style="list-style-type: none"> • Images in focus • Font is clear 			
<u>Presentation Delivery</u> (5) <ul style="list-style-type: none"> • Questions answered appropriately • Within time limit/clear 			
<u>Mission Objectives</u> (5) <ul style="list-style-type: none"> • Location of mission • Clear purposes 			
<u>Background</u> (10) <ul style="list-style-type: none"> • Previous related missions • Previous scientific work 			
<u>Scientific Merit</u> (30) <ul style="list-style-type: none"> • Justification for Mission • Science to be accomplished • Innovation 			
<u>Budget</u> (10) <ul style="list-style-type: none"> • Elements outlined • Source of funding 			
<u>Education & Outreach</u> (10) <ul style="list-style-type: none"> • Citizen science plan • Education plan 			
<u>Citations</u> (15) <ul style="list-style-type: none"> • References slide • Captioned/credited images 			

Panel Decision: Please Circle one

Total Percent _____

Fail Passed w/Major Improv Passed w/Minor Improv Passed/Implement

