



Overview

When President John F. Kennedy set a goal of landing a person on the moon and returning him safely to Earth before the end of the 1960s decade, there was much to learn in order to be able to accomplish that goal. Many missions failed to meet their goals, some with a loss of equipment and others with more tragic results. No matter the outcome, each mission contributed to eventual success and meeting the President's goal. The following activity focuses on the necessity of failure in order to learn from mistakes and ultimately succeed.

This project is conceived as a team project where groups of students work together to research, report, design, construct and explain a memorial to commemorate a failed mission. Please consider asking students in each group to come to consensus on roles for each group member to include:

1. *Project Director* serves as spokesperson for the group, point of contact for group
2. *Research Scientist* maintains records for the group
3. *Materials Engineer* leads collection, management and use of supplies
4. *Life Support Engineer* assures that the group works well together by encouraging one another, contributing, and helping one another
5. *Social Scientist* assures that the group maintains focus on pertinent objectives

The big idea of this project is to combine all the elements of STEAM (science, technology, engineering, the arts, and mathematics) into a single project that requires people to work together in specific roles as a part of a team.

Engagement

When failure results in tragedy, there are often memorials that are created to honor those who lost their lives. Many of these memorials are built across the country. Their purpose is to help us remember people or events that were significant. Brainstorm a list of memorials with which students are familiar, then discuss what is known about each of them. Include what the memorial honors, what the memorial includes (such as sculptures, names, designs), and the materials of which these memorials are made.



Exploration

Walk along the timeline portion of the Giant Moon Map. Read through the missions that have been sent to the Moon. Each mission was the result of much work by many people. The failed missions took a toll on the people who worked on them. After conducting initial research:

- Choose a failed mission
- Research the goals of the mission and the people who worked on the mission
- Find out what caused the mission to fail
- Identify what was lost in the mission
- Understand the historic and scientific significance of the mission

Explanation

Prepare a report to be orally presented to the other groups and teacher to identify the mission the group has selected, describe what the group has discovered concerning the mission and tell any stories the group has gathered related to the failed mission.

Extension

Design and build a memorial to the failed mission. The memorial should in some way tell the story of its historic significance and remember the people that were involved. Determine a location that the memorial could best be located. Be prepared to explain the design and location. The memorial may be in the form of a diagram, flat artwork, video, 3-D computer drawings, model, or diorama of your proposed Visitor Complex.

Evaluation

A rubric has been prepared to assist the teacher in evaluating the project. We suggest that evaluation of each individual's learning resulting from this project is the result of an interview of each student by the teacher using the following rubric for guidance.



Failure is an (essential) Option

Concept	9-10	7-8	5-6	3-4	1-2
Big idea behind the project	Adequate description of how the project is intended to build understanding of how people contribute in different and essential ways in projects.		Describes how he/she contributed to the program with minimal mention of the contributions of other team members.		Describes facts learned during the project.
Architecture and Design	Describes the design and explains how the team arrived at the solution.		Describes the design and significance.		Offers few details of design or significance of the design.
Historic Significance	Describes the mission in detail related to the work of the team.		Describes the historic significance.		Offers few details of historic significance.
Scientific Significance	Describes the scientific purpose of the mission in detail related to the work of the team.		Describes the mission's scientific significance.		Offers few details of scientific significance.
Teamwork	Offers evidence of effectively working as a team member to meet goals.		Describes inconsistent attempts at collaboration		Offers minimal evidence of teamwork.