

Let's Plan to Make History



SHARESPACE
— EDUCATION —

Overview

Students will work together in teams to create a program concerning the first steps taken and words spoken on Mars. The class product will be a video, edited to show the first steps on Mars, a follow-up press conference with the crew, interviews with Flight Director and Deputy Flight Director, and interviews with each of the teams that created the lander, Mars set, EVA suits, and video.

The big idea of the project is for people to work together toward a goal of which they can be proud, but where the work of the many is primarily represented by the few. 400,000 people worked on Apollo 11 to make it possible for Neil Armstrong and Buzz Aldrin to walk on the Moon. We believe it is important for people to understand the selflessness associated with high performing teams.

Background Information

When humans first travel to Mars it is expected that crew may include anywhere between four to seven people but will represent the work of countless thousands of others. This crew will journey in relatively close proximity to one another for six to eight months to reach the planet. During the transit they will have time to thoughtfully consider how they will make history with their first steps on another planet. When Armstrong and Aldrin set foot on the Moon in 1969, NASA had carefully prepared a timeline of events that would take place upon arrival. About the only aspect NASA did not prepare was Neil Armstrong's first words.

Likewise, the actions and words chosen by the Mars crew will represent not only all the people who worked on the program, but also all the people on Earth. The idea behind this activity is to build a simulation where an entire class works towards a goal that is represented by the few that land on Mars and is reported to the world through a video, just like Apollo 11.

Developing communication and collaboration skills is hard work. This project asks that students work together toward a specific goal. It is not necessary that each group follows the same path. It is essential that each team works through the process in a way they find to be logical and fair. The teacher has an essential role in setting the ground rules for the classroom during the project and can use the management structure in place to help teams along. While it is easier to tell people what to do, it is much more valuable if you help the teams work through problems for themselves. Ultimately, kids learn to work together by working together.

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Student Teams and Job Descriptions

1. Executive Team (Exec): The Executive Team will oversee the progress of each team, ensuring the overall mission is on time and completed to required specifications.
 - a. Flight Director (Flight): This person oversees the operations of each team leader and reports to the teacher.
 - b. Deputy Flight Director (D-Flight): This person assists Flight in overseeing the operations of each team leader and reports to Flight. This person also coordinates daily with each Safety Officer and reports information to Flight and the teacher.
 - c. Public Affairs Officer (PAO): This person follows the progress of each team, maintains a public chart of progress and prepares a written report that is filed with Flight, D-Flight, and the teacher.
 - d. Deputy Public Affairs Office (DePAO pronounced DEE-pow): This person assists PAO in following the progress of each team, preparing the chart, and preparing and filing the daily report.
2. Mars Lander Crew (Crew): This team will script an arrival on Mars, act out the script upon arrival on the Mars surface, and be prepared to answer questions as to their process and the historic significance they portrayed. This team must collaborate with the Lander, Surface, EVA, and Video teams.
 - a. Commander (Commander): This person leads the Crew and reports to Executive Team.
 - b. Pilot (Pilot): This person is in charge of safety concerns for the Crew, coordinates safety concerns with the Safety Officers on team with which the crew is collaborating and reports to the Commander.
 - c. Mission Specialist 1 (MS1): This person is primary in writing the EVA script in close collaboration with other members of the crew and reports to the Commander.
 - d. Mission Specialist 2 (MS2): this person is primary in researching history to understand and communicate the significance of the mission. MS2 reports to the Commander.
3. Mars Lander Team (Lander): This team will design and construct a set piece to represent the Mars Lander. It must allow the crew to exit to the surface of the planet and be consistent with the planetary surface conditions. It must allow video to be captured remotely from locations determined in collaboration with the Video team. This team must coordinate with the Crew, Surface, EVA, and Video teams.
 - a. Lander Team Lead (Lander Lead): This person leads the team and reports to Executive team.
 - b. Lander Safety Officer (Lander Safety): This person is in charge of safety concerns for Lander Team and coordinates safety concerns with the Pilot and Safety Officers on teams with which the Lander is collaborating.

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- c. Lander Technicians (Lander Tech): These people are a part of the research, design and construction of the physical lander.
4. Mars Surface Team (Surface): This team will design and construct a set to represent the Mars surface. This team will report their surface conditions to the Lander, EVA, Crew and Video teams.
 - a. Surface Team Lead (Surface Lead): This person leads the team and reports to Executive team.
 - b. Surface Safety Officer (SSO): This person is in charge of safety concerns for Surface Team and coordinates safety concerns with the Pilot and Safety Officers on teams with which the Surface is collaborating.
 - c. Surface Technicians (Surface Tech): These people are a part of the research, design and construction of the physical Mars surface.
5. Mars EVA Suit Team (EVA): This team will design and construct the EVA suits to be worn by the crew for their descent to the surface of Mars. This team will coordinate with the Crew, Lander, Surface, and Video teams.
 - a. EVA Team Lead (EVA Lead): This person leads the team and reports to Executive team.
 - b. EVA Safety Officer (EVA Safety): This person is in charge of safety concerns for EVA Team and coordinates safety concerns with the Pilot and Safety Officers on teams with which the EVA is collaborating.
 - c. EVA Technicians (EVA Tech): These people are a part of the research, design and construction of the Mars EVA Surface space suits.
6. Video Team (VITS): This team will create the final product from video and audio they have captured during the project process, the remote surface EVA, the press conference, and interviews with each of the teams. This team will interact with all of the other teams and each other. This team must capture video from of the EVA remotely. Team members must share responsibilities while taking the lead in their assigned area. The final product must be no longer than 75% of a class period.
 - a. Video Team Lead (VITS Lead): This person leads the VITS team and reports to Executive team.
 - b. Video Team Interviewer (Talent): This person is primary in preparing for and conducting interviews.
 - c. Video Script Writer (Writer): This person works closely with Talent in preparing questions for interviews and with the VITS team in preparing a program outline.
 - d. Video Editing Technician (Editor): This person is primary in capturing video and editing the video into a program.

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Teacher Preparation

Each student needs to be assigned to a position. An application form and list of job descriptions has been provided in the Appendix. Consider using the application process to fill each of the jobs to match student interests to the greatest possible degree. Communicating the difficulty of getting everyone in the perfect position and being transparent in the selection process will go a long way in helping students be on board with your decisions. Recruiting another teacher or an administrator to help is also worthwhile. Ultimately, “hiring” a good staff is the key to running a great project.

Each team has an important job to do and each team depends upon the other teams to complete their work. The big idea here is to create a need to collaborate and communicate. Each team needs direction as to what they are doing. The teacher can explain how everyone works together but a description of the work of each team has been created that you can print and be distributed by the management team.

Sometimes students are reluctant to take part in a project of this nature. One strategy is to offer an alternative assignment. A research paper that discusses the first moon landing, the infrastructure that was created to build and support the equipment, a discussion of how a Mars lander will be different than the 1969 Lunar Lander, an overview of the differences between the Lunar and Martian surfaces, a discussion of how space suit technology has changed and a comparison of the historic significance of the lunar landings and a future Mars landing just about sums up the information that each person will encounter during the project.

The role of a teacher in a project of this type is to assure the safety of the people in the room and be a management process consultant. You may also help point people to content by working through the management structure but resist the urge to become a director. Be prepared to be tested. Students will immediately look to you for direction. You are probably used to the director role and it may take time to get used to working through the management team you have put in place. You are empowering kids to become adults. It is not easy, but it is ultimately worth the effort. You can trust kids to learn.

A big theme of the project is that many people work very hard to create a space mission. A mission to Mars will be the most complex ever done. All of this will support a relatively small number of people who will actually experience the trip first hand. When you debrief after the project is over, please cultivate this understanding in your students as they discuss it.

Throughout the project there is a strong social theme that you, as the teacher, can nurture. Everyone has an important job. The higher you perceive yourself to be in terms of importance, the more people you need to serve and the more responsibility you accept.

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Class Product

The final class product will be a video, no longer than 75% of a class period, that contains the following:

1. Video of the Mars arrival and the associated press conference by the crew
2. Interview with Mars Lander construction team
3. Interview with Mars EVA team
4. Interview with the VITS team
5. Interview with the Executive team

How can the product be displayed?

This video can be displayed and distributed consistent with district rules. Students deserve an audience for their products. Consider sharing the video with another teacher doing the same project at another location and collaborating with them to discuss what each class has learned.

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Handout - Executive Team Tasks (EXEC)

The Executive Team has an essential function that will be critical to the success of the project. This team leads the project, watches for problems, helps teams deal with issues, promotes cooperation among teams, and maintains contact between all team members. It is easy to think of yourselves as the bosses of the project. A better way of thinking about your role is to be the servant to every team. Your primary function is to make it so that each team can accomplish their goals. You can step in and help, but the teams do the work. You have the power to make decisions and have your own way, but a wise executive works to empower their teams. It is your responsibility that work gets done.

Composition of the Team (Please note that these roles can be adjusted based on the size of your classroom. Several tasks can be combined and/or eliminated based on need.)

1. Flight Director (Flight)
 - a. Supervise the operations of each team leader
 - b. Report to the teacher
2. Deputy Flight Director (D-Flight)
 - a. Supervise the operations of each team leader
 - b. Reports to Flight
 - c. Coordinate daily with each Safety Officer
 - d. Report safety information to Flight and the teacher
3. Public Affairs Officer (PAO)
 - a. Follow the progress of each team
 - b. Maintain a public chart of team progress
 - c. Prepare a daily written status report that is filed with Flight, D-Flight, and the teacher
4. Deputy Public Affairs Office (DePAO pronounced DEE-pow)
 - a. Assist PAO in following the progress of each team
 - b. Assist PAO in preparing the progress chart
 - c. Assist PAO in preparing and filing the daily status report.

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Handout - Crew Tasks (CREW)

The role of the Crew of the Mars Lander is essential to the success of the project. The crew is the most visible team in the project. It will be easy to get the idea that you are also the most important. This is not the case. While you are the public face of the project, if this were in fact a mission to Mars, everything you do and accomplish will be because of the work of others. The astronauts literally place their lives in the hands of all the people who develop the mission. Each member of the crew should know as much as possible about every facet of the work being done by other teams. It is important that you remain humble, work closely with the teams as they accomplish their tasks, thank the members of each of the other teams for the work they are doing to allow you to represent them as we make history, and represent all of us proudly when you touch the surface and talk about it in the press conference. The Crew Team will do the following:

1. Work with the Lander team on lander design and construction
2. Work with the EVA team as they develop space suits for your stay on the Mars surface
3. Learn from the Surface team as they create the surface on which you will walk
4. Script an arrival on Mars
5. Act out the script upon arrival on the Mars surface
6. Participate in a post-landing press conference to answer questions as to the process and the historic significance you have portrayed
7. Collaborate with the Lander, Surface, EVA, and Video teams.

8. Composition of the Team
 - a. Commander (Commander)
 - i. Lead the Crew
 - ii. Reports to Executive Team
 - b. Pilot (Pilot)
 - i. In charge of safety concerns for the Crew
 - ii. Coordinates safety concerns with the Safety Officers on team with which the crew is collaborating
 - iii. Assists in Crew tasks
 - iv. Reports to the Commander
 - c. Mission Specialist 1 (MS1)
 - i. Primary in writing the EVA script in close collaboration with other members of the crew
 - ii. Reports to the Commander
 - d. Mission Specialist 2 (MS2)
 - i. Primary in researching history to understand and communicate the significance of the mission and Reports to the Commander

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Handout - Mars Lander Team (Lander)

Mars Lander Team (Lander) is essential to the success of the project. This team will design and construct a set piece to represent the Mars Lander. A good place to start is to research the Apollo Lunar Landers. Information is also available concerning new ideas for landers. There are many ways to go about creating the Lander. It may be just a front with a ladder. It may be a box at the top of a stairway. You may create a literal model or something that is representative of your thinking. You may come up with an entirely different idea. You will work as a team with input from the Exec Team and interactions from Crew, Surface, EVA and VITS. Whatever you design must be tested by the Crew, EVA and VITS teams. The Lander has some specific functions.

1. The Lander must allow the crew to exit to the surface of the planet
2. The Lander must be consistent with the planetary surface conditions
3. The Lander must allow video to be captured remotely from locations determined in collaboration with the Video team
4. The Lander team must coordinate with the Crew, Surface, EVA, and Video teams.

5. Composition of the Team
 - a. Lander Team Lead (Lander Lead)
 - i. Leads the team
 - ii. Reports to Executive team
 - b. Lander Safety Officer (Lander Safety)
 - i. In charge of safety concerns for Lander Team
 - ii. Coordinates safety concerns with the Pilot and Safety Officers on teams with which the Lander is collaborating
 - iii. Assists in Lander Team tasks
 - iv. Reports to Lander Lead
 - c. Lander Technicians (Lander Tech)
 - i. Conduct the research, design and construction of the physical lander
 - ii. Reports to Lander Leader

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Handout - Mars Surface Team (Surface)

Mars Surface Team (Surface) is essential to the success of the project. You are the team who needs to learn about where we are going and what it will be like. You are responsible to help everyone understand the characteristics of Mars. You will determine the landing location with help from the Exec Team and Crew. You will help the Lander Team and EVA Team understand the conditions for which they are designing. The surface you build may not be perfect, but your understanding of the place you are modeling needs to be outstanding. You are the Mars experts.

1. Research the conditions and opportunities for research on Mars
2. Determine a landing location on Mars
3. Research this location
4. Design a set that represents the location
5. Brief the entire class on the chosen location
6. Construct the Mars surface set while the Lander team is constructing the Lander This team will report their surface conditions to the Lander, EVA, Crew and Video teams.

7. Composition of the team
 - a. Surface Team Lead (Surface Lead)
 - i. Leads the team
 - ii. Leads the presentation of Mars surface conditions
 - iii. Reports to Executive team
 - b. Surface Safety Officer (SSO)
 - i. In charge of safety concerns for Surface Team
 - ii. Coordinates safety concerns with the Pilot and Safety Officers on teams with which the Surface is collaborating
 - iii. Assists in Surface Team tasks
 - iv. Reports to Surface Lead
 - c. Surface Technicians (Surface Tech)
 - i. Conduct the research leading to selecting a landing site
 - ii. Works as a part of the team to design and construct the physical Mars surface.
 - iii. Reports to Surface Lead

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Handout - Mars EVA Suit Team (EVA)

Mars EVA Suit Team (EVA) is essential to the success of the project. Will research, design, and fabricate the EVA suits to be worn by the crew while they walk on Mars. You need to become experts in the function of a space suit. You need to design to meet the special needs of Mars. The people who make the EVA suits literally hold the lives of the astronauts in their hands. The team will:

1. Research the function of EVA space suits
2. Learn about the Apollo era suits and how suit design has changed
3. Collaborate with the Surface Team to understand surface conditions
4. Design and fabricate suits to fit each member of the crew.
5. Brief the class on the background, function and design of the EVA suit
6. Coordinate with the Crew, Lander, Surface, and Video teams

7. Composition of the Team
 - a. EVA Team Lead (EVA Lead)
 - i. Leads the team
 - ii. Leads class briefing
 - iii. Reports to Executive team
 - b. EVA Safety Officer (EVA Safety)
 - i. In charge of safety concerns for EVA Team
 - ii. Coordinates safety concerns with the Pilot and Safety Officers on teams with which the EVA is collaborating
 - iii. Assists in EVA Team tasks
 - iv. Reports to EVA Lead
 - c. EVA Technicians (EVA Tech)
 - i. Conduct research related to suit history, function, and current technology
 - ii. Creates design for EVA suit
 - iii. Accomplishes fabrication of the Mars EVA Surface space suits

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Handout - Video Team (VITS)

The Video Team (VITS) is essential to the success of this project. You will provide the product upon which success will be judged by people outside your classroom. This team will interact with all of the other teams and each other. This team must capture video of the EVA remotely. Team members must share responsibilities while taking the lead in their assigned area. Your classmates will want copies of this video. Chances are good that it will be played at graduation parties when that day arrives. The project will be remembered through your work. The team will:

1. Create a plan for the final product video
2. Capture video related to the process throughout the process
3. Capture video of the Mars first steps remotely
4. Capture video of the Crew Press Conference
5. Capture video of each team briefing to the class
6. Create the final product from video and audio they have captured during the project process
7. Submit a video product that is no longer than 75% of a class period

Composition of the Team

- a. Video Team Lead (VITS Lead): This person leads the VITS team and reports to the Executive team.
- b. Video Team Interviewer (Talent): This person is primary in preparing for and conducting interviews.
- c. Video Script Writer (Writer): This person works closely with Talent in preparing questions for interviews and with the VITS team in preparing a program outline.
- d. Video Editing Technician (Editor): This person is primary in capturing video and editing the video into a program.

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Handout - Job Descriptions for Applications

1. **Flight Director (Flight):** This person oversees the operations of each team leader and reports to the teacher.
2. **Deputy Flight Director (D-Flight):** This person assists Flight in overseeing the operations of each team leader and reports to Flight. This person also coordinates daily with each Safety Officer and reports information to Flight and the teacher.
3. **Public Affairs Officer (PAO):** This person follows the progress of each team, maintains a public chart of progress and prepares a written report that is filed with Flight, D-Flight, and the teacher.
4. **Deputy Public Affairs Office (DePAO pronounced DEE-pow):** This person assists PAO in following the progress of each team, preparing the chart, and preparing and filing the daily report.
5. **Crew of the Mars Lander:** This team will script an arrival on Mars, act out the script upon arrival on the Mars surface, and be prepared to answer questions as to their process and the historic significance they portrayed. This team must collaborate with the Lander, Surface, EVA, and Video teams.
 - a. **Commander (Commander):** This person leads the Crew and reports to Executive Team.
 - b. **Pilot (Pilot):** This person is in charge of safety concerns for the Crew, coordinates safety concerns with the Safety Officers on team with which the crew is collaborating and reports to the Commander.
 - c. **Mission Specialist 1 (MS1):** This person is primary in writing the EVA script in close collaboration with other members of the crew and reports to the Commander.
 - d. **Mission Specialist 2 (MS2):** this person is primary in researching history to understand and communicate the significance of the mission. MS2 reports to the Commander.
6. **Mars Lander Team (Lander):** This team will design and construct a set piece to represent the Mars Lander. It must allow the crew to exit to the surface of the planet and be consistent with the planetary surface conditions. It must allow video to be captured remotely from locations determined in collaboration with the Video team. This team must coordinate with the Crew, Surface, EVA, and Video teams.
 - a. **Lander Team Lead (Lander Lead):** This person leads the team and reports to the Executive team.
 - b. **Lander Safety Officer (Lander Safety):** This person is in charge of safety concerns for Lander Team and coordinates safety concerns with the Pilot and Safety Officers on teams with which the Lander is collaborating.

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- c. Lander Technicians (Lander Tech): These people are a part of the research, design and construction of the physical lander.
7. Mars Surface Team (Surface): This team will design and construct a set to represent the Mars surface. This team will report their surface conditions to the Lander, EVA, Crew and Video teams.
 - a. Surface Team Lead (Surface Lead): This person leads the team and reports to the Executive team.
 - b. Surface Safety Officer (SSO): This person is in charge of safety concerns for Surface Team and coordinates safety concerns with the Pilot and Safety Officers on teams with which the Surface is collaborating.
 - c. Surface Technicians (Surface Tech): These people are a part of the research, design and construction of the physical Mars surface.
8. Mars EVA Suit Team (EVA): This team will design and construct the EVA suits to be worn by the crew for their descent to the surface of Mars. This team will coordinate with the Crew, Lander, Surface, and Video teams.
 - a. EVA Team Lead (EVA Lead): This person leads the team and reports to the Executive team.
 - b. EVA Safety Officer (EVA Safety): This person is in charge of safety concerns for EVA Team and coordinates safety concerns with the Pilot and Safety Officers on teams with which the EVA is collaborating.
 - c. EVA Technicians (EVA Tech): These people are a part of the research, design and construction of the Mars EVA Surface space suits.
9. Video Team (VITS): This team will create the final product from video and audio they have captured during the project process, the remote surface EVA, the press conference, and interviews with each of the teams. This team will interact with all of the other teams and each other. This team must capture video from of the EVA remotely. Team members must share responsibilities while taking the lead in their assigned area. The final product must be no longer than 75% of a class period.
 - a. Video Team Lead (VITS Lead): This person leads the VITS team and reports to the Executive team.
 - b. Video Team Interviewer (Talent): This person is primary in preparing for and conducting interviews.
 - c. Video Script Writer (Writer): This person works closely with Talent in preparing questions for interviews and with the VITS team in preparing a program outline.
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Handout - Let's Plan to Make History Job Application

Name _____

Date _____

Official Use

First choice _____

Date received _____

Position assigned

Second choice _____

Third choice _____

What personal traits do you exhibit that make you a good choice for your first choice job?

Please describe an action you have taken while at school that provides evidence that you are a good candidate for the job for which you are applying.

Please describe your ability to work with other people.

Please describe a time you have worked with another person on a project.

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Evaluation

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.

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 big programs.		Describes how he/she contributed to the program and the work of only his/her team.		Describes facts learned during the project.
Characteristics of Mars	Describes the Mars environment in detail related to the work of multiple teams.		Describes the Mars environment from only the viewpoint of his/her team.		Describes few details concerning the Mars environment.
Requirements for life support	Describes life support in detail related to the work of multiple teams.		Describes life support from only the viewpoint of his/her team.		Describes few details concerning the requirements for supporting life on Mars.
Working as part of a team	Offers evidence of effectively working as a team member to meet goals.		Describes inconsistent attempts at collaboration		Offers minimal evidence of teamwork.

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