Mission to Mars

*Will Your Team Get the Ticket?*

Your team is tasked with launching the first human mission to Mars.

* How will you get the colonists there, and how will you keep them alive?
* What is your purpose for this journey?
* How can your company win the rights to the mission with a persuasive pitch?
* ...And once on Mars, how will you respond when a crisis strikes?

*Logistics of the journey*: Your team will go on the initial Mars mission. After landing on Mars and setting up your colony, your team must also have a long-term vision for human life on Mars.

In the following pages, you will find 8 possible roles for this mission, and an application.

1. At the start of the project: Individually, you will choose your four top jobs, and fill out the application at the bottom of this document.
2. Throughout the project:, your team will contribute to a “brain dump” shared google doc, where you will put relevant notes from each course.
3. The last week of the project, you will have time in core to finalize your presentations, and fully rehearse your mission proposal.

**Presentation details:**

*Each team has 25 minutes to pitch to an international conglomerate of investors, eager to support a private company’s Mission to Mars. This investment group will be represented by select students, faculty, administrators, and outside experts. Only one group will win the investor’s support.*

* Part 1: Pitch (18-20 minutes): Present your general mission, including a video and a google slide presentation. That allows each student approximately 2-3 minutes to present your specific job plans. (Both video and slides should be embedded in your website)
* Part 2: Crisis Management (5-8 minutes): Problem solve a crisis scenario. All eight possible scenarios are provided in this doc, so that you can prep for each. You will not know which scenario you will get until you are on the stage. (Based on your team’s cumulative performance during the project, you may earn the ability to pass on your first assigned crisis scenario.)

**Colony Command Positions:**

**1.CAPTAIN**

*Responsibilities/Skills*: The official leader of the mission and the mission proposal process. Must be able to examine issues from multiple perspectives, earn the respect of others, be a good listener, and ultimately facilitate all the moving parts associated with the the proposal and the actual mission. Must work well with others and have an interest in cultural, legal, and strategic analysis. Must be able to communicate clearly. Strong conflict resolution skills. The captain is the pilot and also responsible for navigation control:

* How will we get from Earth to Mars?
* Can we leave at any time of year/month/day?
* Why are we colonizing Mars? And how is this linked to previous space exploration?

**2.ENGINEER**

*Responsibilities/Skills*: The Engineer is the mechanic who is responsible for all power generation, computer systems, and the ship’s propulsion and landing systems. Must have strong computer, engineering and robotics, and math skills; must be strong at problem-solving and analysis.

The engineer needs to determine processes for taking off and landing.

* How much fuel will be required, how will we land on Mars?
* Will we station a ship in orbit around Mars? etc.
* The engineer has strong knowledge of previous exploration attempts on Earth, various vessels launched, and mechanical problems faced. How will you use this knowledge to vision the Mars Mission?

**3.MEDIC**

*Responsibilities/Skills*: Responsible for wellness of the people and treating the injured. Also responsible for all future training of any medical staff. Good data entry skills, understanding of the biological sciences, and ability to monitor and analyze auditory and visual responses, respiration rates, heart rates and skin temperature. Must have knowledge of infectious and environmental disease control. The medic will need to address health issues related to challenge of space flight and Martian living.

* How does the human body deal with decompression or the vacuum of space?
* How will bodies deal with low Martian gravity? How to deal with g-forces of takeoff and landing?
* What medical problems may you face on Mars, based on historical data concerning colonization of new territories ?
* What hard decisions may you have to make) for the survival of most?

**4.COUNSELOR**

*Responsibilities/Skills*: Responsible for the psychological and interpersonal well being of the crew members. While the Medical Officer is responsible for the physical aspect of the crew; the counselor is responsible for the mental health of the crew. Need to understand of the effects and treatment of stress on human psychology. Must be a good listener and problem-solver. The counselor will need to study the mental health challenges associated with deep space travel.

* What are some of the issues the international space station inhabitants faced?
* How do personality profiles of the team match up the the rigor of space travel?
* How might a journey to a new planet influence the psyche of the colonists?

**5.ACADEMIC**

*Responsibilities/Skills*: Responsible for saving and maintaining libraries and records. Manage the structures that will raise the future generations of colonists. Plan ahead for supporting families with children, from preschool through high education. Establish daycares, schools, and universities. Skilled at both written and oral communication. Must be able to plan, organize, and write clearly. Must be a well-rounded academic. Must have solid people skills and connect well with youth.The academic will need to prepare the next generation and new colonists for Martian life. Look at how and why education systems were set up in the early US. Analyze the role of youth in the early colonies.

* What are the skills that will be most useful for survival and success on Mars?
* What about the philosophies of the formation of government?

**6.COMMUNICATION OFFICER**

*Responsibilities/Skills*: Responsible for all verbal communication between the colony and Mission Control, and for maintaining communication throughout the colony. Proficiency in technology, as well as reading, writing, and oral communications; ability to work in high-stress situations; good time-management.

The communication officer will need to understand the logistics associated with interspace communication.

* What are the general modes of data transference?
* How long will messages take to send?
* How do we use satellites as relay stations?

**7. TACTICAL OFFICER**

*Responsibilities/Skills*: Responsible for defense of ship and security in the colony. Manages the security teams and writes Incident and Damage Reports. In the event of alien contact, Tactical will manage the interactions with aliens. Must be able to maintain order and write clearly. Must be a team player. Legal background is helpful. Mathematics skills a must. The tactical officer will need to defend the ship/colony.

* What types of security measures are appropriate for the ship and Martian colony?
* How do standard projectile weapons work in space… on Mars?
* How would you communicate with sentient alien life?
* What conflicts might emerge in the colony?
* How will you prepare for future potential conflicts once on Mars?

**8.OPERATIONS OFFICER**

*Responsibilities/Skills*: Responsible for sustaining life en route and once on Mars. Make a plan for the dwellings and food sources. Also responsible for performing water supply tests, oxygen levels, soil samples, conducting research on radioactivity levels and hazardous materials. Responsible for ordering, distributing, inspection of all supplies, including food. Must be able to multi-task and understand big picture. The operations officer will need to understand the life support logistics.

* How will you make oxygen while removing carbon?
* How will you keep food in a self sustaining cycle?
* How will you test your supply levels?

**CRISIS MANAGEMENT SCENARIOS:**

1. Alien Contact -- Within a month of arrival, your rover discovers an access tunnel leading to an alien subterranean habitat. No humans have attempted exploration as of yet. This habitat houses non-Martian aliens, who have been secretly observing Earth from their Martian outpost for some period of time. Their intentions are unclear. The aliens have not detected the rover. How do you navigate first contact, if at all?
2. Zombie Plague -- 10 years from now, there are five colony pods of 100 each. A bite from a Martian dust mite creates a Patient Zero (zombie) on Colony 1 -- the agricultural pod. Patient Zero attacked other colonists, was subdued and contained. Patient Zero was treated with a standard antibiotic and made a full recovery. Within a week, 80 have been infected, and 20 have holed up in the utility closet, separated from the food and medical facilities. Each pod has enough antibiotic to treat 10 people. What do you do?
3. Oxygen Failure -- Two years later, 100 colonists are on Mars, living in one large dome. The oxygen levels are lowering as carbon scrubbers are failing. These scrubbers seem to be reacting with a Martian molecule, *clogafiltertrine*, that can not be removed from the air filtration system. No amount of cleaning will fix the problem and new filters cannot be made with current technology on Mars. New scrubbers are being made on Earth that are non-reactive with *clogafiltertrine* and the earliest the filters can reach Mars is 3 months. There is enough air for 1 month for all 100 colonists, 2 months for 50 colonists, or 3 months for 10 colonists. What do you do?
4. Secret Colony -- Within a week of arrival, the colonists are contacted via radio by other Earthlings on Mars. The group, calling themselves the Iron Lion Zionists, claims a portion of the planet as their homeland. They state that they would like to be left alone and have their borders respected and will defend their territory with force if required. After this initial contact, all communication ends and they will not respond to being hailed on the radio. All Earth governments state that they have no knowledge of any other Mars mission/colonizing efforts. On Earth, there is a group known as Iron Lion Zionists, who are a fringe religious group led by the eccentric billionaire, Marley Jah Selassie. How do you proceed?
5. Separatists -- 20 years from now, there are 20 colony pods of 100 each. The colony has always utilized an elected council to govern day-to-day operations and to carry out the wishes of United Nations governing body. The latest elected council was elected under a populist platform. They are concerned with the amount of work and taxes required by the UN. The majority of colony council is pushing the colonists to cut off ties with Earth. They would like to form their own government and claim Mars as their own. Colonists are split on whether or not this is the right choice. What do you do?
6. Life Extension -- 80 years from now, there are 2,000 colonists living under two large domes. All of the the first colonists and their children are still alive, except for two that died from a rapid decompression accident in 2074. After the first 20 years on Mars it became evident that all of the animals brought from Earth were living at least double their normal life spans. Martian research later proved that Mars has life-extending effects on humans. The original governing council determined this to be a secret that would not be shared with Earth, for fear of a mass migration. Earthlings are still unaware of this situation, but there is a small but vocal group of Martians who feel that it is unethical to not share this. What to do?
7. Martian Children: 60 years from now, Martian settlers have built the launching technology to attempt bi-planetary travel. After launching the first Martian families back to Earth, tragedy strikes upon landing. Earth-born Martians suffered reacclimation pains, but eventually rebuild muscle, bone density, and connective tissue strength to live comfortably. Sadly, Martian-born children cannot survive on Earth, and die from immediate organ failure on Earth. How does this change humanity’s vision to become multi-planetary, if at all?
8. New World Overload: 100 years have passed. War has overtaken Earth since the Martian colony has taken root. WWIII is devastating and destabilizing multiple regions on Earth, and millions of Earthlings are desperate to move to Mars. Rogue organizations are launching their own missions, and sometimes hijack planned colonial transfers. Many of these groups, official and unofficial, are warring with each other. Mars *does* have the capacity for more colonists, and is currently terraforming into a fully habitable planet with no need for biodomes within 50 years. Do you as Martians close your boundaries? Welcome all immigrants and refugees? Accept some newcomers, but not all? Place certain people into refugee areas/pods? Wage war on Earth?

**Mission to Mars: Job Application**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Group No.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Please review all of the available positions and list your top four choices.

1st Choice \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2nd Choice \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3rd Choice \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4th Choice \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Relevant Skills and Experience

What experiences and skills make you the best candidate for these positions? (Include any relevant organizations or clubs to which you belong, or any honors, awards, publications, or personal achievements that you have received.)

Personal Statement

Describe the world you come from — for example, your family, community or school — and tell us how your world has shaped your dream to journey to Mars.

*(Your personal statement should be exactly that — personal. This is your opportunity to tell us about yourself — your hopes, ambitions, life experiences, inspirations. Be open. Be reflective. Find your individual voice and express it honestly.)*

*TIES Q1 - MISSION TO MARS RUBRIC NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

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| **SUBJECT** | **CATEGORY** | **TOTAL** |
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| **English** | Quest Quality Writing + Website:: Ideas: Content is engaging, focused, and developed.  Organization: Clear organization and transitions provide solid flow of argument.  Voice: personality, sense of audience, and command of language.  Word Choice: precision, effectiveness, and imagery make this a compelling piece.  Sentence Fluency: rhythm, flow, and variety.  Conventions: grammar, spelling, punctuation, and formatting. | /10 |
| **English** | Public Speaking: Utilized pathos, ethos and logos to make a strong persuasive pitch.  Incorporated *VIBES* into your presentation and your crisis scenario presentation: (Voice and Visuals, Informed and Interesting, Body Language and Breath, Eye Contact and Emotion, Slow and Sign Post.) Make sure your speech incorporates both team motifs! | /10 |
|  | ***ENGLISH TOTAL:*** | **/20** |
| **Science** | **Group**: Did the group produce a coherent science vision that would actually deal with the challenges and realities of a Mission to Mars? Did the scientific contributions for all group members contribution to a thoughtful shared vision? Was the science of crisis scenario addressed appropriately? | /10 |
| **Science** | **Individual**: Did you address all of the individual responsibilities associated with your position? Was the science valid and was it elegant in its usage? Was the scientific aspect of your position included in your team’s crisis scenario response? | /10 |
|  | ***SCIENCE TOTAL:*** | **/20** |
| **GROUP**  **WORK** | 5% teachers assessing ind. google doc effort; Clearly and diligently took useful notes throughout the quarter in your google docs that linked to specific Mission to Mars content.  5% teachers assessing individual contributions to group work;  5% peer assessment  Students will score each other for group overall effort  Students will score themselves and will be incentivized to match their peer score with a bonus  5% teachers assessing overall group dynamics and performance | **/20** |
| **CLASS x2** | ***CLASS x2*** | **/20** |
| **FINAL GRADE** | **TIES GRADE FOR \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ CLASS:** | **/100** |

*COMMENTS:*

*MISSION TO MARS - PEER REVIEW RUBRIC Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

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| **CLASS** | **CATEGORY** | **Exp.**  **Echo** | **Flight**  **14** | **MET** | **MED** | **Path 8** | **Vesta 8** |
| **History** | Content: Incorporates links to history content throughout the main presentation. Demonstrates a deep grasp of concepts from US History and how they link with a Mars mission. Has a thorough, specific, and convincing reason for colonizing Mars. Shows a sophisticated vision for how to build a successful colony once there. | /10 | /10 | /10 | /10 | /10 | /10 |
| **History** | Presentation: Able to convey historical understanding while on stage. Confident, nuanced ability to answer questions and think on your feet when tasked with the crisis scenario. In your solution, you seamlessly incorporate an example from US history that informs your resolution of the situation. | /10 | /10 | /10 | /10 | /10 | /10 |
| **English** | Written Work on Slides + Website: Content: engaging, clear, and focused. Organization: Clear organization and transitions provide solid flow. Voice: personality, sense of audience, and command of language. Word Choice: precision, effectiveness, and imagery. Sentence Fluency: rhythm, flow, and variety. Conventions: grammar, spelling, punctuation, and formatting. | /10 | /10 | /10 | /10 | /10 | /10 |
| **English** | Public Speaking: Utilized pathos, ethos and logos to make a strong persuasive pitch. Incorporated VIBES into your presentation and your crisis scenario presentation: (Voice + Visuals, Informed + Interesting, Body Language + Breath, Eye Contact + Emotion, Slow + Sign Post.) | /10 | /10 | /10 | /10 | /10 | /10 |
| **Science** | **Group**: Did the group produce a coherent science vision that would actually deal with the challenges and realities of a Mission to Mars? Did the scientific contributions for all group members contribution to a thoughtful shared vision? Was the science of crisis scenario addressed appropriately? | /10 | /10 | /10 | /10 | /10 | /10 |
| **Science** | **Individual**: Did each team member address all of the individual responsibilities associated with their position? Was the science valid and was it elegant in its usage? Was the scientific aspect of each position included in the team’s crisis scenario response? | /10 | /10 | /10 | /10 | /10 | /10 |
| **FINAL GRADE** | **Peer review overall grade =>** | **/60** | **/60** | **/60** | **/60** | **/60** | **/60** |

*Extra Credit: Match your teachers’ final rankings, and earn 2% extra credit to individual grade.*

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| ***Ranking*** | *1st* | *2nd* | *3rd* | *4th* | *5th* | *6th* |
| ***Team*** |  |  |  |  |  |  |

*MISSION TO MARS - PANELISTS Name(s):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

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| **CLASS** | **CATEGORY** | **Exp.**  **Echo** | **Flight**  **14** | **MET** | **MED** | **Path 8** | **Vesta 8** |
| **History** | Content: Incorporates links to history content throughout the main presentation. Demonstrates a deep grasp of concepts from US History and how they link with a Mars mission. Has a thorough, specific, and convincing reason for colonizing Mars. Shows a sophisticated vision for how to build a successful colony once there. | /10 | /10 | /10 | /10 | /10 | /10 |
| **History** | Presentation: Able to convey historical understanding while on stage. Confident, nuanced ability to answer questions and think on your feet when tasked with the crisis scenario. In your solution, you seamlessly incorporate an example from US history that informs your resolution of the situation. | /10 | /10 | /10 | /10 | /10 | /10 |
| **English** | Written Work on Slides + Website: *Content*: engaging, clear, and focused. *Organization*: Clear organization and transitions provide solid flow. *Voice*: personality, sense of audience, and command of language. *Word Choice*: precision, effectiveness, and imagery. *Sentence Fluency*: rhythm, flow, and variety. *Conventions*: grammar, spelling, punctuation, and formatting. | /10 | /10 | /10 | /10 | /10 | /10 |
| **English** | Public Speaking: Utilized pathos, ethos and logos to make a strong persuasive pitch. Incorporated *VIBES* into your presentation and your crisis scenario presentation: (Voice + Visuals, Informed + Interesting, Body Language + Breath, Eye Contact + Emotion, Slow + Sign Post.) | /10 | /10 | /10 | /10 | /10 | /10 |
| **Science** | **Group**: Did the group produce a coherent science vision that would actually deal with the challenges and realities of a Mission to Mars? Did the scientific contributions for all group members contribution to a thoughtful shared vision? Was the science of crisis scenario addressed appropriately? | /10 | /10 | /10 | /10 | /10 | /10 |
| **Science** | **Individual**: Did each team member address all of the individual responsibilities associated with their position? Was the science valid and was it elegant in its usage? Was the scientific aspect of each position included in the team’s crisis scenario response? | /10 | /10 | /10 | /10 | /10 | /10 |
| **FINAL GRADE** | **overall grade =>** | **/60** | **/60** | **/60** | **/60** | **/60** | **/60** |