Design Maker Challenge # 1 - Mission to Mars

Megan Roughley
James Halliday
Mike Forsyth

Maker Challenge	https://drive.google.com/file/d/1x11B86xE8aUhPSo-O7TA-Hoehw9C46Ip/view?usp=sharing
2-Minute Video	https://drive.google.com/file/d/1O4cU9X1d59lHUJ9bGv3KzqKAlFPO42am/view?usp=sharing
Supplementary Photos	https://drive.google.com/file/d/1qXestCBocRL6y21xK_IlwBOUPAVNdbU8/view?usp=sharing https://drive.google.com/file/d/1eiXFrS4n0VzrInC8C0qnfsZ0Fe7Um_Ti/view?usp=sharing

Critical Questions for Consideration

1. Why did you select the tools that you did to complete this challenge?

We chose to focus on no-tech and low-tech to design our ramp as we know a rover itself would be quite high-tech. The first problem we discussed was the accessibility requirements to get individuals on the rover itself. We wanted to create as little waste as possible while creating our prototype in order to promote sustainability and environmentally friendly practices. We chose cardboard as the main base for our ramp and entrance to our rover. It was easily manipulated to ensure we met commercial ramp requirements; a standard slope is 1:12 inches or about 5 degrees of incline. Ensuring we had good markers was another thing we had to consider so that the Ozobot was able to read the code clearly and consistently. We also had to do a lot of trial and error in terms of speed and direction and learned that you need about one inch of space between different variations of code for the Ozobot.

2. How will these tools best support your solution to support travel to Mars?

The Ozobot is a good analogy for persons who need the use of a wheelchair for mobility as it is wheeled and is designed to be used on low-slope smooth surfaces. The use of cardboard is easy to modify as needed and is low/no cost so errors or designs that need to be scrapped are not a financial strain.

3. What are some of the challenges you encountered with these tools/this task?

We struggled with the Ozobot in several ways. The first Ozobot had a low battery and would not operate, requiring a shift to a new Ozobot that was fully charged. Our Ozobot pathway was over multiple sheets of paper and several of the joints halted the bot. Several of our codes were initially too faint for the bot to recognize. We also needed to increase the speed/momentum of the bot to have it climb a steeper part of the ramp.

4. What problem(s) did you need to consider through your design?

The problems we needed to consider were what degree did the ramp need to be in order to promote inclusivity. Our goal was to allow for any individual who may be able bodied or not to enter the space rover safely. We looked to creating a ramp that met the public and commercial guidelines to the steepness it needed to be.

5. How did you rectify these problems?

We rectified this problem by looking up what the standard slope was for an accessibility ramp, followed by constructing our ramp to meet said requirements.

6. What is your plan of execution?

We built the ramp and mock rover out of cardboard, and then created our own Ozobot track using the pieces of paper to guide it through the hatch and have a short victory celebration.

7. How might you engage a younger audience in this challenge?

We might engage with a younger audience by prompting them to answer the challenge while we served as mentors for them. They may need greater guidance with the challenge to tackle the task.

8. How do you ensure that the means by which you support travel to Is Mars inclusive?

We wanted to address the privilege that able bodied individuals have when entering the rover to Mars and re-examine how one would enter it. By constructing a ramp to enter the rover, people who may have a difficulty walking/moving, it allows for anyone to enter the mission to populate and colonize Mars.

9. How might you showcase your design/prototype to a global Audience?

We are sharing our video and this reflection to our E-Portfolios housed on the internet making them public. We could also publish our video to a maker community discussion board.

10. What are your next steps?

Our next steps could be collaborating with other makers to use our ramp as an inspiration for a rover. Now that we have tackled the first problem, ensuring people with mobility issues are able to enter the rover, how can we ensure the interior of the rover is accessible?

11. How might you test your ideas?

We tested our idea by constructing a model using cardboard and other no-tech materials to simulate the ramp and rover, while we used the Ozobot to simulate someone using a wheelchair.

12. How did the information from the video and website impact your considerations and decisions in your design?

When reading the website, it lacked any information on entering the rover and there was a bias of people who are physically capable of entering are allowed to participate. From there, it was clear to our group that we needed to construct a ramp that made participation accessible to all.