

Category Name:

Beyond Earth

Unique Challenge ID: SCL1472

Challenge:

Explore

At an average distance of 140 million miles, Mars is one of Earth's closest habitable neighbors. Earth and Mars are the only terrestrial planets in the inner solar system that have moons.

Exploring Mars and its moons is the road to making humanity multiplanetary. Mars's Moons - Phobos and Deimos can provide vital information about Mars' formation and evolution.

While preparing for space explorations, various iterations, tests and virtual simulations are done for the smooth conduct of the mission. In this challenge, using the SpaceFlight Simulator, you're required to launch a rocket to Phobos, orbit it around Phobos at a height of 30KM, and efficiently return back to Earth.

Background

Space agencies, international (US, Russia, China, Japan, EU, India) and private (SpaceX, Blue Origin, Boeing) both, have shown an urgency in finding a new home for humanity. When it comes to the worlds beyond Earth in our Solar System, it's only natural to wonder whether our planet was alone in being home to native life. The fourth planet from the Sun, Mars, is a particularly interesting candidate, as there's overwhelming evidence that its surface once possessed large amounts of liquid water, pooling in lakes, rivers, and even oceans.

While Mars itself is vast, and any life that was once present has likely been extinct for billions of years, there's a simple place to go to look for evidence of ancient processes that are easy to access: its innermost moon, Phobos.

This isn't a pipe dream, nor is it science fiction, but an actual mission approved and planned for launch in 2024: Martian Moons eXploration (MMX) by Japan Aerospace Exploration Agency (JAXA). Link : <u>https://www.mmx.jaxa.jp/en/mission/</u> This challenge invites participants to plan and virtually simulate the entire mission on SpaceFlight Simulator.

Android App Link : <u>https://play.google.com/store/apps/details?id=com.StefMorojna.SpaceflightSim</u>ulator iOS App Link : <u>https://apps.apple.com/us/app/spaceflight-simulator/id1308057272</u> SpaceFlight Simulator App can be installed on your PC too by using Bluestacks. Bluestacks Link : https://www.bluestacks.com/download.html

You have to design and build your very own rocket taking into account the requirements of the mission that are as follows:

- 1. Launch the rocket to Phobos
- 2. Orbit around Phobos at a height of 30KM
- 3. Travel back to Earth
- 4. Land safely on Earth

The entire mission, along with building the rocket, needs to be screen recorded. Also, an audio narration of the entire mission should be recorded. The Video file of the entire mission and Audio file of the narration of the mission will be taken as the final submission.

Evaluation Pointer

Efficiency

- How many engines were used?
- How many separation stages does the rocket have?
- What was the total time taken to complete the mission?
- What amount of fuel was saved after completing the mission?

Checkpoints

- Did the rocket cross the Karman Line?
- Was the appropriate transfer window taken?
- Did the rocket cross Mars?
- Did the rocket get inserted into Phobos Orbit?

Did the rocket get inserted into Earth's Orbit? • Did the rocket land back on Earth safely?

Submission Explanation

Sample Submission

Video of the simulation (From building the rocket to landing back on Earth) Audio or Script having detailed narration of the entire mission