

A Trip to Mars

Overview

Participants play a game that steps through a human mission to Mars, to learn about the variety of people on the ground supporting missions, and the factors that can affect a mission outcome.

Activity Time

10 minutes, although participants may opt to repeat the game multiple times

Intended Audience

Families or other mixed-age groups, including children as young as 4 years old *with assistance from an older child, teen, or adult*

School-aged children ages 5 and up

Tweens

What's the Point?

- 🔍 Each space mission is supported by a large team with different responsibilities.
- 🔍 Missions are influenced by many factors, including weather, solar storms, human health, and technological problems.

Materials

For the facilitator:

- 2 to 4 large dice constructed using:
 - 2-4 (6-12-inch-wide) cube-shaped boxes
 - 12-24 pieces of colorful paper
 - 1 thick, dark marker
 - Tape
- 7 (28" x 22") poster boards for the different mission stages
- A printout of the "Poster Scenarios" on thin cardstock or thick paper so that participants cannot see through it.
- An uploaded copy of the video "How Do You Get to Mars?" from <http://mars.nasa.gov/msl/multimedia/videos/index.cfm?v=32#>



For each participant:

- A copy of the Mission Instructions

Preparation

Before the event

- Prepare the posters:
 - Each Poster should have the step written at the top:
Step One: Launch, Step Two: Travel, Step Three A: Habitat, Step Three B: Greenhouse, Step Three C: Ice, Step Four: Return
 - Print and fold the poster scenarios, then tape each of the six (Flight Director, Space Communicator, Flight Activities Officer, Flight Surgeon, Weather Officer, and Public Affairs Officer) to the appropriate poster, so that lifting the flap will reveal the information.
 - Tape the posters in order on walls or prop them up on stands.
- Wrap or cover the faces of the boxes with the colorful paper, and write numbers 1 through 6 on the faces, to be used as dice.



Activity

1. Share ideas and knowledge.

- Introduce yourself. Help the participants learn each other's names (if they don't already).
- Show the participants the video "How Do You Get To Mars?" and frame the activity with the main message: each space mission has a large team with different responsibilities helping it to be successful.
- Ask the participants what they would like to explore on Mars.
 - What would they do on Mars?
 - What are some of the reasons that a trip to Mars is difficult?

As much as possible, encourage the participants to offer information and to respond to others' questions. This model can be used to answer questions such as:

- Why do they want to go to Mars?
- What are some of the jobs people could do on Mars?
- What help do astronauts need from people on Earth?

2. Explain the game.

Let the participants know that they will be using a mission sheet to follow the steps of a human mission to Mars and go to different posters.

- Each poster has different mission staff on it, with a number for written next to each one.
- At each poster, they will each roll a box with numbers on it (a die).
- Depending on what number they get, they will lift a flap on the poster and follow the directions.
- When they successfully complete a mission, they can start a new one, until everyone has finished at least one mission.

These are just a handful of the people that support NASA missions:

Flight Director (FD) leads the flight control team and is responsible for the overall mission; the Flight Director makes all decisions regarding a safe, expedient flight.

Space Communicator (CAPCOM) serves as primary communicator between flight control and astronauts.

Flight Activities Officer (FAO) plans and supports crew activities, checklists, procedures and schedules.

Flight Surgeon (Surgeon) monitors crew activities, coordinates the medical operations flight control team, provides crew consultation, and advises flight director of the crew's health status.

Weather Officer provides up-to-date information on the potential weather or space weather hazards near the spacecraft.

Public Affairs Officer (PAO) provides mission commentary to the news media and the public.

3. **Conclude.** Draw on the participants' observations and reflections:

- What are the different types of jobs for people helping with space missions?
- What are some of the problems that might come up during a mission?
- Do all missions always finish successfully?
- Aside from being an astronaut, what roles would they like to perform in a mission?



Mission Instructions: Your Trip to Mars

A large team of people on Earth make decisions to keep you and the other astronauts in your crew safe and help you explore Mars:

- **Flight Director** (FD) leads the flight control team and is responsible for the overall mission. The Flight Director makes all decisions regarding a safe flight.
- **Space Communicator** (CAPCOM) serves as primary communicator between the flight control team on Earth and the astronauts.
- **Flight Activities Officer** (FAO) plans and supports the astronauts' activities, procedures and schedules.
- **Flight Surgeon** (Surgeon) monitors the astronauts' activities to keep track of their health, and leads the medical operations flight control team to advise the astronauts on health concerns and issues.
- **Weather Officer** provides up-to-date information on the potential weather or space weather hazards near the spacecraft.
- **Public Affairs Officer** (PAO) provides information to the news media and the public.

Go to each poster and roll one of the dice. Lift the flap of the flight control team member with the number you rolled, then follow the directions. The directions may say to go back to an earlier poster, or move to the next poster.

If the directions say “roll again,” then stay at that poster and roll one of the dice again, and follow the new directions.

Step One Launch

Many factors are important in a launch—the equipment, the astronauts' health, and even the weather! Once your launch is successful, go to the “Travel to Mars” poster.

Go to the “Launch” poster and roll one of the dice to determine whether or not you and the rest of the crew are on your way to Mars!

Step Two Travel to Mars

You travel for eight months to reach Mars. Like on a long road trip, it is sometimes hard for you and your crew to get along in such a small space with little privacy. Thanks to years of practice working as a team, you are all keeping a positive attitude during the long journey, traveling far from your friends and family, and exercising daily to keep your bones and muscles in shape without Earth's gravity.

Go to the “Travel” poster and roll one of the dice to learn what types of issues your crew can face during your trip.

Step Three Start a colony

Once you have arrived at Mars, you need to choose between three activities on Mars. Go to one of the three posters:

Three A. Build a Mars crew habitat

Your habitat was delivered to the surface of Mars by robotic spacecraft, but it is still tightly packaged from the journey and not yet assembled. Are you successful at assembling it?

Go to the “Habitat” poster and roll one of the dice to determine whether or not you are successful at assembling the habitat.

OR

Three B. Grow crops

After surviving so long on freeze-dried packages of food that you brought with you from Earth, you and your crew are hungry for fresh fruits and vegetables! You must plant crops in a greenhouse and tend them for several weeks and months. Are you successful at growing and harvesting the first crops on Mars?

Go to the “Greenhouse” poster and roll one of the dice to determine whether or not you are successful at growing crops.

OR

Three C. Search for ice deposits

You and your crew — and your crops — need water to survive. Water can also be used to manufacture oxygen to breathe or to make rocket fuel. Take a trip to some nearby ice deposits and bring ice back to the colony to melt for water.

Go to the “Ice” poster and roll one of the dice to determine whether or not you are successful at collecting water.

Step Four Return to Earth

You and the rest of your crew have explored Mars and it’s time to return to Earth. It’s been a long trip, but you’re looking forward to being back home again!

Go to the “Return” poster and see how the team on Earth helps your capsule to splash down safely in the ocean.

You and your crew are home after a triumphant mission to Mars! Welcome home!