



FACILITATOR GUIDE

Mission to Space

Learning objectives

- A successful mission to space takes a lot of planning, research, and curiosity.
- Developing, planning, and completing a mission to space is a complex process with many steps.
- Missions to space are full of surprises and challenges.

Materials

- Game board
- 4 game pieces
- 1 dice
- 1 deck of Mission Boost cards
- 30-second timer
- Dry-erase whiteboard
- Dry-erase markers
- Microfiber cloth to erase whiteboard
- Activity and facilitator guides
- *Tips for Leading Hands-on Activities*

The Explore Science toolkit comes complete with all necessary materials for this activity. Materials are also readily available online or at local retail stores to create or restock activity kits. Graphic files can be downloaded from www.nisenet.org.

Notes to the presenter

This game encourages visitors to think about all the different aspects of completing a successful mission to space. The game board shows the more technical aspects of a mission, such as project planning, engineering, data collection, and data analysis. The Mission Boost cards supplement the board by providing a chance for visitors to ask questions, express creativity, and make Earth and space science connections to their everyday lives. These cards support the third learning objective, which is to be curious and ask questions.

As visitors move through the game, encourage them as they complete Mission Boost challenges, and celebrate their achievements and efforts along the way. At the end of their missions, many visitors may be excited to finish and forget to read about their mission's

discovery. If this happens, gently direct their attention back to the board. Whether they read it or you read it to them, learning the results of their mission is an excellent way for visitors to wrap up the game and reinforce the learning objectives.

Younger children may need to team up with a caregiver or older sibling or friend. You can also let them have more time to complete some of the challenges (for example, finding all of the rovers on the board).

Conversational prompts

Use the cards to facilitate back and forth conversation with players. Players may be curious to know more about the science trivia, or may want to share information that they already know. If a player seems engaged with the content, try asking what they think about the card or if the card reminds them of anything they've heard about before. Maybe they have some of their own space stories to share!

Many of the cards are exploratory in nature with no right or wrong answer. With these cards, encourage visitors to use their imagination and to think about what they already know. For example, one card asks visitors to draw the surface of an exoplanet. You could ask them if their planet would have features found on Earth, such as grass or mountains, and then ask them how those features might be different. Would the grass still be green? Would mountains have snow on the peaks? What color would the sky be? Using questions like these will create a memorable and engaging experience for participants.

Additionally, there is a challenge about drawing a model of the solar system. In this challenge, some visitors may worry that they don't know all the planets or cannot list them in the correct order. If this happens, you can guide them along as they draw. For example, if a younger player only knows the number of planets, they can draw a circle for each one. With each circle, you can name the planet or count along with them.

Difficult concepts

Not all NASA work takes place in big cities like Houston, TX, or Washington, D.C. Spacecraft team members are diverse, and so are the locations and facilities where the spacecraft are designed and built. Encourage players to think about who might be involved with a Mission to Space. Does anyone want to grow up to work on space exploration? NASA research centers are all over the United States. Many different companies and universities also partner with NASA to design, build, and test spacecraft as well as analyze the data from missions.

In addition to exploring our solar system and beyond, NASA teams plan missions to look back down toward Earth. Mission teams use satellites orbiting Earth, as well as other aircraft, to collect information so they can better understand and predict how our own planet is changing.

Staff training resources

Refer to the *Tips for Leading Hands-on Activities* sheet in your activity materials.

- Content Training Video: <https://vimeo.com/366778069>
- Activity Training Video: <https://vimeo.com/366777902>
- Edu-cathalon Facilitation Strategies Video: <https://vimeo.com/304241578>

The NISE Network has a curated list of programs, media, and professional development resources that directly relate to the toolkit. These resources can be viewed and downloaded from: www.nisenet.org/earthspacekitextensions

Credits and rights

This activity was adapted from the *Sun, Earth, Universe* exhibition, developed by the Science Museum of Minnesota. Graphics and illustrations courtesy Emily Maletz Graphic Design. More information can be found at: <https://www.nisenet.org/sunearthuniverse>.

Image of Jupiter courtesy of NASA/JPL-Caltech/SwRI/MSSS.

Artist's depiction of Mars Rover Opportunity courtesy of NASA/JPL/Cornell University.



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