



FACILITATOR GUIDE

Story Blocks

Learning objectives

- We imagine and tell stories—using images, characters, and emotions—to communicate our ideas and dreams.
- Just like you, scientists, engineers, and artists use their creativity and imagination to tell stories about space missions that might happen in the future.
- Future NASA missions will continue to explore the Moon in preparation for the return of humans to its surface.

Materials

- Space Mission 1 Block Set (Maple Landmark, SKU 73372)
- Wooden building blocks
- Moon board
- Dry-erase foam blocks
- Dry-erase markers
- Block cards
- Pencils
- Optional: _____'s Mission to the Moon take-home
- Optional: Moon-related picture books

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. You can substitute other Moon-themed building blocks, but you may need to modify the prompts or the block cards to match.

Advance preparation

Before starting this activity, read through the block cards for the Space Mission 1 Block Set. This will help prepare you to answer questions participants may have about the blocks and how they connect to real NASA missions.

Notes to the presenter

The goal of this activity is to allow for open-ended creative play while also guiding children and caregivers to develop a strong story about science and exploration. Some participants may be perfectly happy to just play with the blocks and use their imaginations, and that's okay! Other groups may seem eager for a bit more facilitation and interaction.

While children play with the blocks and build their imaginary worlds, they'll soon discover how complicated it is to plan a mission to the Moon. By telling a story, children will learn that astronauts visited the Moon in the past; they'll also explore the idea that NASA plans to go back to the Moon to make even more discoveries. The young learners will also do a little bit of what scientists do by considering new ideas and asking questions about the unknown.

Try introducing the dry-erase foam blocks once participants have had a chance to become familiar with the wooden blocks provided. These blocks are completely optional, but they can provide a nice prop to encourage creative conversation and discussion. What new ideas do participants have for items they might want to include in their story?

Conversational prompts

Every satisfying story is structured with a beginning, a middle, and an end. The following are some prompts that can help deepen learning and engagement during each stage of the story as children and caregivers work together to develop their narrative.

BEGINNING: Start by inviting children into the activity, and creating context for their story arc.

- Would you like to plan a trip to explore the Moon?
- What do you think the Moon is like?
- What do you think you'd find on the Moon? If you could send a rover to the Moon, what do you think it would find?
- What questions do you have about the Moon?
- Will your mission be searching for something? Building something? Collecting information?
- What tools would you need to explore the Moon and answer your questions?
- Who are the characters in your story? What or who will go on your trip to the Moon?

MIDDLE: Ask questions to guide their play and encourage them to act out scenes using building blocks.

- What do you think it would feel like to be on the Moon?
- What can you see? What do you observe on the ground?
- How could you move/get around on the Moon? How would you live and survive (thrive) on the Moon? What would you need to be happy?

- Does your mission encounter any problems?
 - What happens if you run out of fuel?
 - What happens if there's a moonquake?
 - If something breaks, how will you fix it using only the tools you already have on the Moon?

END: Every mission tells a story.

- What did you discover?
- Do you have any new questions?
- Do you want to plan another trip to the Moon?
- What future missions are necessary to answer your questions?
- How did you solve the problems your mission encountered, if any?

As participants develop and share their stories, you might also consider using some of these creativity-enhancing open-ended prompts and questions to keep the story going and draw out more detail.

- I wonder...
- Can you tell me more about...
- Do you have a favorite part...
- What was challenging...

Engaging adults and older participants

Caregivers can choose to use the _____'s Mission to the Moon booklet provided to write down story notes from the storyteller. This booklet becomes a nice take-home that can be illustrated later on to help reinforce learning and continue the conversation.

You may notice that some younger children become engrossed in playing with the blocks and building a world but are less willing to narrate the experience—that's fine. If young visitors are struggling to tell a story, try encouraging the caregivers to help out their young one(s) or to use the optional take-home booklets. That way both the caregiver and the child can work together to craft a fun story. Caregivers can also choose to take a blank booklet home with them to retell and co-author the story together later on.

The block cards provided with the activity can be used as cues to contribute background information, connections to NASA science, and storytelling prompts. You can model how to use these cards by noticing something a child is doing and choosing a matching card. Invite parents, caregivers, and even older siblings to use the cards too.

Difficult concepts

Robotic missions

NASA is responsible for many types of space missions. The human exploration of space is thrilling and has captivated our imagination for decades. With many movies, TV shows, and books on this subject, participants of this activity may believe that all space missions include astronauts. In fact, NASA has completed many robotic space missions. These missions have launched space telescopes to look out toward the edge of the known universe, sent robotic rovers to the surfaces of planets and moons in our solar system, and navigated orbiting satellites to capture breathtaking images of Earth from space. This activity is about imagination and storytelling, so don't feel the need to steer participants' ideas toward any particular subject matter. However, reminding participants about the diversity of NASA space missions may inspire them to create their own unique pathway toward discovery.

The search for life

With this activity, it may be important to gently remind participants that we haven't found life or signs of life anywhere else in the universe, including the Moon. Some people have had experiences, heard about events, or seen popular media that suggest extraterrestrial creatures exist and have even visited Earth. Scientists have not validated any of these accounts, so the current scientific opinion is that no "aliens" have been found or have been in contact with people or planet Earth.

However, scientists do expect that life exists beyond Earth and that one day we may encounter it. There are many research programs looking for evidence of life in other parts of the universe. If we find living organisms on other planets, they are likely to look very different from us, from other life on Earth, and from the "little green men" of popular culture.

If participants bring up things they've experienced or have heard of, you might say something like, "Yes, we hear lots of stories and see movies about aliens, and that makes them seem real to us. But right now, scientists haven't been able to verify any alien encounters, so we're still looking for good evidence of life beyond Earth." Or, "Yes, sometimes we experience things we can't explain, and we wonder if extraterrestrials could be involved. But right now, scientists haven't been able to verify any alien encounters, so we're still looking for good evidence of life beyond Earth."

Earthrise image

Some participants, especially younger children, may have trouble understanding the Earth hemisphere block. This block is a reference to the famous image, often referred to as Earthrise, captured by astronauts on NASA's Apollo 8 mission while orbiting the Moon in 1968. This image provided a new perspective of our fragile home planet for those of us on Earth and renewed interest in protecting the environment. Try asking some questions specifically about that block:

- What do you think this block represents? What would it feel like to look back at the Earth?
- How is the sky you see on the Moon different from the sky we see on Earth?
- What would you miss about Earth on a long trip away from home?

Looking back and seeing Earth so small and far away can help us all appreciate many of the special attributes of our home planet.

Types of telescopes

Telescopes come in all shapes and sizes—from the classical model that looks like a long tube with lenses on each end to giant radar dishes that can observe “invisible” light.

Gravity in Space

Many participants are likely to think that there is no gravity in space. However, gravity does exist in space and is the most important force involved in how objects move throughout the Universe! The notion of no gravity in space likely originates from seeing astronauts floating in the International Space Station or in movies where artificial gravity is created by spinning spacecraft. In fact, as a spacecraft falls around Earth (orbits Earth) the people and objects in the spacecraft also fall around Earth (orbit Earth) in the same way. Because the acceleration of an object by gravity’s pull is the same for the spacecraft, people, and other objects on board, it can *seem* as though there is no gravity to the people traveling in the spacecraft, but in reality it is still an active force.

We feel gravity on Earth and on the Moon because Earth and the Moon surfaces push back to keep us from falling more. The greater distance one is from a planet, the weaker gravitational pull from that planet. When we send spacecraft off Earth to the moon, gravity’s pull from Earth decreases as the spacecraft leaves Earth. As a spacecraft moves from Earth to the Moon, there is a point in which the moon’s gravity becomes stronger than Earth’s gravity due to the spacecraft being so much closer in distance to the Moon than Earth. The Moon’s gravity pulls both spacecraft and astronauts to the moon in the same way again making it seem there is no gravity until the spacecraft slows down to land. Then the people in the spacecraft will feel a push on them from the spacecraft as it lands on the Moon.

Staff training resources

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

- Content Training Video: <https://vimeo.com/441410273>
- Activity Training Video: <https://vimeo.com/441410204>
- Edu-Cathalon Facilitation Training 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 inspired by the existing Space Mission 1 Blocks from Maple Landmark. Block illustrations used with permission.

Image of rover lab courtesy NASA/Bridget Caswell, Alcyon Technical Services.

Image of Cabeus crater courtesy NASA/GSFC/ASU.

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