Grades K-12

To the Moon to Stay K-12 Challenge

25+ minutes (hands-on activity & challenge)

Mission Overview

The MIT To the Moon to Stay team challenges K-12 students to design a future lunar habitat or village. We encourage you to be creative! Show us what this habitat will look like, how it’s built, what technology it will require, and/or what everyday life will look like for the people who live there.

Through this activity, you’ll learn about what it takes to live on the Moon, and how close we are to sending humans to the Moon, to stay! A YouTube video will give a basic introduction to the topic, and we’ve provided lots of optional resources to support your brainstorming efforts. Use your creativity to create a zine (a 6-page booklet, instructions below) describing a lunar habitat or village and what it is like to live there.

We’ve provided some resources below to provide guidance for the K-12 Challenge, particularly for educators or parents to facilitate a virtual or at-home activity. The activity can be adapted to accommodate different age groups.

All entries can be submitted on our website before Saturday, April 18th. Please feel free to email us at tothemoon@mit.edu with any questions or requests for more resources.

Mission Summary

Getting started - 3-10 minutes
1. Introductory video

Activity: To the Moon to Stay - 20+ minutes
2. Create your zine template
3. Be creative!

Wrap-up - 5 minutes
4. Submit your zine to the To The Moon to Stay K-12 Challenge (optional)

Extensions: Learning more (optional resources)

Objectives

The student will:
✔ Learn about what it takes to live on the Moon and how close we are to sending humans to the Moon, to stay!
✔ Use their creativity to design a lunar habitat or village and describe what living on the Moon would be like.
Activity Guide

Materials, Resources and Prep

- An 8.5 x 11” piece of paper
- Scissors
- Writing utensils
- Optional: Any available craft supplies
  - Colored pencils, crayons, markers, etc.
  - Old magazines or other images for collages
  - Glue stick

Getting Started - 3-10 min

1. Introductory Video

   - (For older students), we recommend starting the activity by showing this video about why people are going back to the Moon: https://youtu.be/O7JtOokF0PU (~10 min)

   - (For younger students), we suggest this video instead: https://www.youtube.com/watch?v=TNrhADcTNBk (~3 min)

Activity: To the Moon to Stay Zines - 20+ min
2. Create your Zine Template

- A zine is a 6-page booklet created from a 8.5x11” piece of paper, which can include text, drawings, or collages.

- Instructions are included [here](#). Feel free to use other online resources and zine examples, but ensure that you follow the 6-page format.

3. Be creative!

- **Design a future lunar habitat or village** and create a zine to explain your idea.

- We encourage you to be creative! Show us what this habitat will look like, how it’s built, what technology it will require, and/or what everyday life will look like for the people who live there.

- *(For older students:) As you design your lunar habitat, consider the “when”. Is your habitat used by a small crew of astronauts arriving on the Moon in the next decade? Or are you imagining a lunar village with many inhabitants 100 years in the future? Or is it somewhere in between? All options are acceptable, but we want you to think critically about how this habitat could be different in each scenario!*

- If you want more information to assist in your brainstorming efforts, check out the resources provided in the “Extensions” section below

**Wrap-Up**

4. Submit your zine to the To The Moon to Stay K-12 Challenge (optional)

- Unfold your zine and scan or photograph it to create a digital copy. The result should be a printable 1-sided 8.5x11 page, which can be printed and refolded into a booklet.

- Submit your Zine here: [https://www.tothemoon.mit.edu/k12-challenge](https://www.tothemoon.mit.edu/k12-challenge)

- Selected winners will have their zines displayed on our website to inspire the MIT community and will receive a small “swag bag” prize from MIT. (While we will accept submissions from anywhere, please note that we are only able to ship prizes to students located in the U.S. Non-U.S. students may have the opportunity to be published on our website, but will not receive a swag bag.)

**Extensions: Learning More (optional resources)**

- More Activities

  - For more space-related activities, check out the [MIT Full STEAM Ahead](#) Week 3 Package on Space Exploration (scheduled for release on April 6th).
• **NASA’s Current Efforts to Return to the Moon**
  
  o With the Artemis Program, NASA plans to return to the Moon for the first time in almost 50 years (humans were last on the Moon during Apollo 17 in 1972). NASA’s Artemis Program aims to land astronauts on the moon by 2024, including the first woman on the Moon.
  
  o The Moon landing is a stepping stone to test our capabilities before sending astronauts to Mars in the 2030s. We can learn a lot from the Moon. We hope that this time, humanity will be going to the Moon to stay and to maintain a constant human presence on the lunar surface.
  
  o For kids ages 5-12, NASA has created a printable activity book: [Forward to the the Moon with Artemis: Explorer Activities](#)
  
  o For more information, see [NASA’s Artemis website](#)

• **The Human Body in Space**
  
  o During this time of social distancing, we are experiencing a taste of what it’s like for astronauts to be in isolated and confined environments in space! We can use our personal experiences in isolation to think about what villages on the Moon should look like. Astronauts on the Moon will likely be in confined spaces without many opportunities to go outside. In addition, for initial missions, crews will be kept to small groups, which means astronauts will mostly socialize with the same 4-5 people in their crew for the extended period of the mission. Some limited communication with Earth will be available, but there will be a time delay. Think about activities you’ve done during your at-home isolated and confined environment that might maintain astronauts’ mood and motivation during a mission on the Moon!
  
  o The Moon’s gravity is only 17% of the gravity that we experience on Earth. This can cause bone and muscle loss (among other effects), which can increase risks of fracture and injury, especially after returning to Earth. On the International Space Station, astronauts exercise regularly to mitigate the effects of reduced gravity.
  
  o For more information about the human body in space, see [this webpage](#) from NASA

• **Space Architecture**
  
  o For space architecture inspiration, take a look at these resources:
    - Living Underground on Other Worlds. Exploring Lava Tubes: [https://www.youtube.com/watch?v=tCcx93NIPWM](https://www.youtube.com/watch?v=tCcx93NIPWM)


- Lunar Habitation Study by Foster and Partners, who are part of a consortium established by the European Space Agency: [https://www.fosterandpartners.com/projects/lunar-habitation/](https://www.fosterandpartners.com/projects/lunar-habitation/) (click on “gallery”)

- 3D-Printed Mars Habitat Designed by AI SpaceFactory: [https://www.aispacefactory.com/marsha](https://www.aispacefactory.com/marsha)

- **Additional K-12 Activities from NASA**

  - If you are looking for more activities during school shutdowns, check out these at-home activities from NASA:
    - NASA STEM @ Home for Students Grades K-4
    - NASA Kids’ Club
    - 10+ Things to Do with NASA at Home (including an overview of the Moon)