

# Mission:

# Staying Safe in Space

## Mission Briefing

Think about hazards that we face on Earth like storms such as tornadoes and hurricanes. We are lucky to have alert systems that warn us when these dangers are coming. While astronauts don't face these dangers, they do face dangers like radiation from solar energy particle storms.

In your Engineering Design Notebook, think about:

- How can you solve a problem you cannot see?
- What protections are needed when exploring space?

## Learn More

Check out this article

[5 Hazards of Human Spaceflight](#)

Watch these videos

[Hazard 1: Space Radiation](#)

[Orion Backstage: Evaluating Radiation Protection Plans for Astronauts](#)



## Career Connection

Meet Leo, the LEGO® Space Team Safety Officer. Leo works to ensure the health and safety of the public, the workforce, facilities and property during the launch, flight, landing, and testing of spacecrafts.

At NASA, safety is a top priority. Safety Officers assure safety and enhance the success of all NASA activities through the development, implementation and oversight of agency wide policies and procedures.



### Let's meet a NASA Safety Officer

Pedro Lopez is the Safety Lead for Human Rating, Crew Survival, and Enterprise Verification and Validation, Exploration Systems Development Safety and Mission Assurance! Pedro's job is to make sure all Exploration Systems Development Programs like Orion, Space Launch Systems, and Exploration Ground Systems as well as Gateway meet the certification requirements for transporting and housing human beings to space.

For more about Pedro Lopez check out this article:

[Meet Pedro Lopez](#)

### Your Mission

Now it's your turn to create a prototype model that will alert astronauts that there is danger. Consider what type of device will best alert the astronauts to ensure their safety. Think about other types of alarms that you have seen. What do you think is the most important information your device should include for the astronauts?

Will your alert system:

- Include sounds or lights?
- Throw a ball?
- Have a waving mechanism?

Brainstorm and sketch out your ideas. Be sure to explain what task you are trying to complete with your device. Build, test, and iterate on your model. Don't be afraid to try different ideas. If it doesn't work, that's ok try something new!

# Mission:

## The Right Tool for the Job

### Mission Briefing

Think about tools you use to complete different jobs. For example, you might use a shovel to dig a hole or a pencil to write a letter. Astronauts use specialized tools too, such as tools needed to repair a spacecraft. Think about what types of tools might be used when in a spacecraft or when exploring the surface of the Moon or Mars.

In your Engineering Design Notebook, think about:

- What factors in space change the way we use our tools?
- What tasks need to be completed in space that we might need tools for?
- How do scientists help design tools that astronauts will use in space?

### Learn More

Check out these articles

[Dust: An Out-of-This World Problem](#)

[JSC's Preparations for the Next Moon Walk are Underway \(Underwater\)](#)

Watch this video

[NASA Prepares to Explore the Moon: Spacesuits and Tools](#)



### Career Connection

Meet Sofie, Scientist for the LEGO® Space Team. Sofie is focused on studies relevant to mission success, safety, and benefits for humanity. This includes fields like solar radiation, human research, physical science, biology and biotechnology, and earth and space science.

Conducting science experiments while in space requires the development of many specialty tools. These tools are created to ensure ease of use for the astronauts. By studying places on Earth that are similar to places on the Moon, for example, scientists can better design tools that will be used in space.



### Let's meet a NASA Scientist

Kelsey Young is a Planetary Geologist at NASA. That means she studies how other planets (and moons and asteroids and comets and whatever else is floating out there) form and evolve over time. She works in different field sites all over the world and in the ocean. Kelsey uses sites on earth that resemble other planets, to study how planetary surfaces form and evolve and to also determine how astronauts will explore other planets in the future. She is part of multiple teams who work to simulate specific aspects of spaceflight, including the NASA Johnson Space Center led NASA Extreme Environment Mission Operations (NEEMO) team which conducts underwater missions to simulate space flight.

### For more about Kelsey Young:

[Kelsey Young Dives Into Fieldwork With Aplomb](#)

[Meet Former NASA Intern Kelsey Young](#)

### Your Mission

Now it's time for you to create a tool that astronauts can use in space. Design a tool you could use in space to complete a task. Think about what task you are designing for and what the tool needs to do. What features does the tool need in order to accomplish this task? What features will you include in your tool?

Brainstorm and sketch out your ideas. Be sure to explain what task you are trying to complete with your tool. Build, test, and iterate on your model. Don't be afraid to try different ideas. If it doesn't work, you can try something new!