

Mission Instructions: Explore Shackleton

Shackleton Crater is near the Moon's South Pole. The bottom of the crater is in permanent shadow, at extremely cold temperatures. Shackleton is believed to have large stores of frozen water, possibly mixed with rock.

Your mission at Shackleton is to search for and mine ice samples to return to Gateway for study. If the quality is good enough, this water can be used for drinking, for producing oxygen, and as fuel for future spacecraft.



A large team of people on Earth and at Gateway make decisions to keep your crew safe and help you explore Shackleton Crater:

Flight Director leads the flight control team and is responsible for the overall mission.

Mission Engineer supervises critical hardware testing and handling.

Flight Activities Officer plans and supports your crew's mission activities.

Flight Surgeon monitors your crew's health.

Weather Officer provides information on weather and space weather hazards.

Electrical Engineer supervises electrical systems testing and handling.

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.

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 from Earth

Many factors are important in a launch—the equipment, the astronauts’ health, and even the weather! Once your launch is successful, go to the “Gateway Activities” 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 the Moon!

Step Two Gateway Activities

The Gateway is a space station for exploration around the Moon and beyond. This outpost will have research laboratories and will study sections of the Moon that have not been investigated by astronauts or robots. Gateway will serve as a hub to transition space crafts for deep space exploration.

At the Gateway, your crew will check the status of your equipment that was sent to Shackleton, including a module from which you will explore the crater. Your crew will have a final training at Gateway using their mining equipment before departing for the Moon.

Go to the “Gateway” poster and roll one of the dice to learn what types of issues your crew may face during your stay.

Step Three Mission Activity: Explore Shackleton

You and your crew need water to survive. Water can also be used to manufacture oxygen to breathe or to make rocket fuel. Once you have arrived at Shackleton, you need to search, find and mine the ice deposits to make water for future explorers to use.

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

Step Four Return to Earth

You and the rest of your crew have found multiple ice samples and stored them in thermos containers for further analysis. It’s time to return to the Gateway and home to Earth.

Go to the “Return” poster and see how your mission ends.

You and your crew are back after a triumphant mission to Shackleton Crater! It’s been a long trip, but you’re looking forward to learning whether the ice can be used for water, oxygen, and fuel for exploring the solar system!



Mission Instructions: Visit Aristarchus

Aristarchus plateau contains both the ancient cratered, light lunar highlands and the younger, dark volcanic basalt lunar lowlands. There are several volcanic features in the region, including ancient explosive volcanos, lava flows, and lava tubes, as well as impact craters.

Your mission is to compare volcanos at Aristarchus with those on Earth and build a picture of the history of the Moon, and to study the natural lava tubes that exist at the site.



A large team of people on Earth and at Gateway make decisions to keep your crew safe and help you explore Aristarchus Plateau:

Flight Director leads the flight control team and is responsible for the overall mission.

Mission Engineer supervises critical hardware testing and handling.

Flight Activities Officer plans and supports your crew's mission activities.

Flight Surgeon monitors your crew's health.

Weather Officer provides information on weather and space weather hazards.

Electrical Engineer supervises electrical systems testing and handling.

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.

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 from Earth

Many factors are important in a launch—the equipment, the astronauts’ health, and even the weather! Once your launch is successful, go to the “Gateway Activities” 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 the Gateway!

Step Two Gateway Activities

The Gateway is a space station for exploration around the Moon and beyond. This outpost will have research laboratories and will study sections of the Moon that have not been investigated by astronauts or robots. Gateway will serve as a hub to transition space crafts for deep space exploration.

At the Gateway, your crew will check the status of your equipment that was sent to Shackleton, including a lunar rover that you will use to travel throughout the region. Your crew will have a final training on monitoring temperature and radiation levels, before departing for the Moon.

Go to the “Gateway” poster and roll one of the dice to learn what types of issues your crew may face during your stay.

Step Three Mission Activity: Explore Aristarchus

Your crew will observe the volcanic features and take rock samples, as evidence of the types of volcanic activity on the Moon. The rocks will also be examined as resources that could be mined for building lunar outposts or future spacecraft.

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

Step Four Return from the Moon

You and the rest of your crew have been successful analyzing the ancient volcanic activity at Aristarchus. It’s time to return to the Gateway.

Go to the “Return” poster and see how your mission ends.

You and your crew are back after a triumphant mission to the Aristarchus Plateau! It’s been a long trip, but you’re looking forward to seeing the scientific results.



Mission Instructions: Explore Crisium

Mare Crisium is a lunar basin on the far eastern side of the Moon, near the Moon's equator. Surrounded by the lunar highlands but filled with thick, ancient basalt lava flows, Mare Crisium is an ideal site for a robotic factory, the Rocket Assembly Laboratory, from which to build and launch spacecraft into the solar system. The site already has some robotic machines assembling the laboratory. Your team's mission is to analyze the ongoing effort and to service and repair any robots that are malfunctioning.



A large team of people on Earth and at Gateway make decisions to keep your crew safe and help you explore Mare Crisium:

Flight Director leads the flight control team and is responsible for the overall mission.

Mission Engineer supervises critical hardware testing and handling.

Flight Activities Officer plans and supports your crew's mission activities.

Flight Surgeon monitors your crew's health.

Weather Officer provides information on weather and space weather hazards.

Electrical Engineer supervises electrical systems testing and handling.

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.

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 from Earth

Many factors are important in a launch—the equipment, the astronauts' health, and even the weather! Once your launch is successful, go to the “Gateway Activities” 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 the Moon!

Step Two Gateway Activities

The Gateway is a space station for exploration around the Moon and beyond. This outpost will have research laboratories and will study sections of the Moon that have not been investigated by astronauts or robots. Gateway will serve as a hub to transition space crafts for deep space exploration.

At the Gateway, your team will check the status of the laboratory that is preparing to build rockets. Your team will have a final training at Gateway, learning how to test and make minor adjustments to the robots.

Go to the “Gateway” poster and roll one of the dice to learn what types of issues your crew may face during your stay.

Step Three Mission Activity: Crisium Basin

Your team is examining the status of the Rocket Assembly Laboratory (RAL). The RAL includes the building, which has an airlock and atmosphere, as well as the robotic machines that are preparing to build rockets! The robots need maintenance and updates, and some may need repairs.

Go to the “Mission” poster and roll one of the dice to determine whether or not you are successful at servicing the robots in the RAL.

Step Four Return to Earth

You and the rest of your crew have reprogrammed two robots and provided updates and mechanical servicing to three others. It's time to return to the Gateway and home to Earth.

Go to the “Return” poster and see how your mission ends.

You and your crew are home after a triumphant mission to Crisium Basin! It's been a long trip, but you're looking forward to seeing the work proceed at the Rocket Assembly Laboratory.

