

# MISSION X

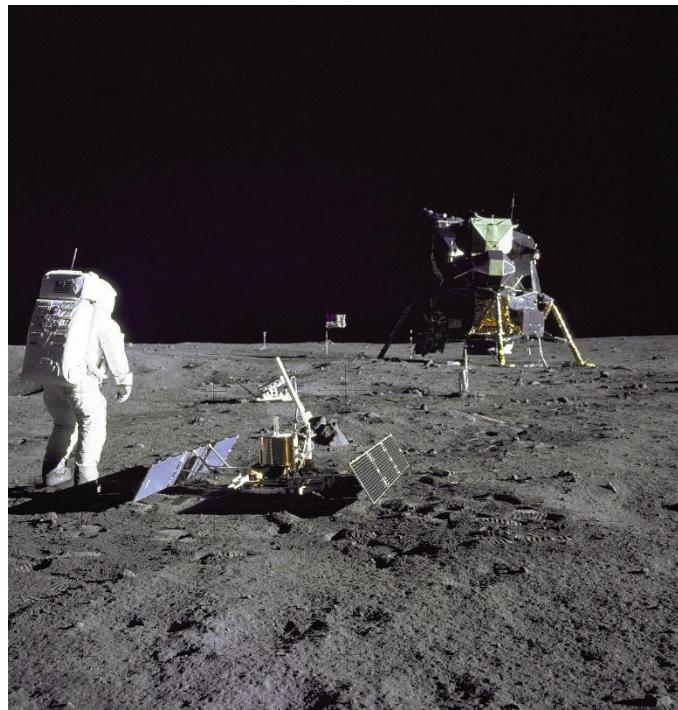
TRAIN LIKE AN ASTRONAUT

## LUNAR EXPLORATION



### MISSION DESCRIPTION

The students are on a mission aboard the new lunar base set up in a crater at the Moon's South Pole. However, the surface of our natural satellite is a very hostile environment and oxygen and water resources are limited. So you need to be quick to collect samples during exploration trips. The crew will have to think on their feet and help each other to complete their mission.



### SUMMARY

**Theme:** Physical Education & Sports

**Age:** 3-6

**Session duration:** 60 min

**Venue:** outdoors or indoor gymnasium

### Learning objectives:

- Improving coordination and speed;
- Thinking things through;
- Making individual progress for the benefit of the team.



## MISSION CONTEXT

**Though impossible in the last century, is the hypothesis of a future lunar base still so far-fetched today?**

3D printing of buildings using lunar soil, a fold-out lunar base, a virtual assistant – some members of the scientific community are actively working on settling humans on the Moon!

### IN SPACE

- Because there is no atmosphere, and because of solar radiation and extreme temperature changes or even due to the journey itself, lunar expeditions have always been a challenge. With limited space and resources, human lunar exploration missions have never exceeded four days. The record goes to astronauts Eugene Cernan and Harrison Schmitt, who stayed on the surface of the Moon for 74 hours 59 minutes and 40 seconds during the Apollo 17 mission.
- So far, only the United States has managed to land humans on the Moon, with a total of 12 astronauts setting foot on our satellite. During the various Apollo missions, the astronauts wore very cumbersome suits, weighing up to 70 kg, which made it very difficult for them to move around. The Moon's low gravity (1/6 that of Earth) also makes exploration more difficult. With limited time to achieve the different objectives of each mission, astronauts need excellent coordination and analytical skills, as well as the ability to work as part of a team, in order to be as effective as possible during the missions.
- The various astronauts have already been able to explore five different sites on the visible side of the Moon. They were able to collect and bring back to Earth 382 kg of lunar rock. While the astronauts on the first three missions had to travel on foot, a rover was added to the equipment on the next three missions to make it easier to get around.



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### ON EARTH

After more than 50 years without humans on the Moon, the launch of the Chinese Chang'e programme and above all the Artemis programme led by the United States has rekindled the interest of the space world in our satellite. The Artemis programme even plans to send a crew back to the Moon before the end of the decade, with the Artemis III mission.

Against this backdrop, a number of international projects are being set up to develop technologies that will make it easier to explore our satellite. A lunar space station, called Gateway, was even due to be launched for the Artemis III mission to serve as a relay between the Earth and the Moon, but its launch has been postponed due to time and cost constraints. Several lunar base projects are also being developed, particularly at the European Space Agency. In France, the French space agency, CNES, is developing tools within its Spaceship FR department to specify the requirements for the space bases of tomorrow. A rover assistant and a cabin assistant are already being developed.



*Artist's view of the Gateway lunar space station © Nasa*

For more information:

- [Rendezvous with the Moon](#)
- [Thomas Pesquet's training](#)
- [Preparing the crew of Artemis II](#)

## **MISSION PREPARATION**

### **For the facilitator**

- Choose a large area with hiding places.
- Hide equipment or bags of "lunar" samples on the playground.



### **Organising the activity with the students**

- Class divided into teams of 3 or 4 students.



### **Options if you need to adapt**

- The students can help make the equipment or samples before the activity
- To increase the difficulty, you can vary the weight and shape of the parts
- You can adapt the difficulty of the hiding places according to the students

## **MISSION SEQUENCE**

Suggested step-by-step instructions for carrying out the activity

### **Explanation of the reference situation**

Class divided into teams of 3 or 4 students. Each team is grouped together in an area marked out by markers. The students take it in turns to fetch the equipment. For each student, the teacher shows a picture or gives a description of the object to be retrieved (a specific search area can be set aside for each team). Each student must recover between 3 and 5 objects, and the mission ends when all the equipment and samples have been brought back to the zone.

*Bonus: To make the exercise more immersive, you can make the objects with your students in class and decorate the areas to make them look like a lunar base.*

### **Contextualisation of the situation to be given to the students**

The new astronaut crew has arrived on the Moon and settled into the lunar base. They will now have to set off on an exploration mission to recover lunar samples and the experiments carried out by the previous crew. Be careful, oxygen resources are limited! So, they're going to have to be quick to recover all the equipment before they run out of air.

### **Organisation**

The students remain in their (lunar) base and take it in turns to explore the area to recover a sample. All the students have from 3 to 5 turns in the game, which ends when all the objects have been returned to the base.

Please note that the student groups do not compete. The teacher triggers the start of the mission for all the teams simultaneously. You can repeat the exercise, while changing the teams and adapting them according to the abilities or difficulties of the students.

## **ADAPTING THE MISSION**

### **Increase Difficulty/Intensity**

- Increase the number of objects to be retrieved.
- Vary the size, shape and weight of the objects to be retrieved.
- Increase the size of the search zone.
- Working against the clock, have them get the job done as quickly as possible.
- Increase the difficulty of the hiding places.

### **Reduce Difficulty/Intensity**

- Reduce the number of objects to be retrieved.
- Use objects that don't weigh too much.
- Reduce the size of the search zone.
- Don't hide the objects.

### **Increase accessibility**

- Mix the groups so that the most confident students help the others.
- Place objects at heights that are easy to reach for any students with disabilities.
- We'd love to hear your suggestions!

### **Possible extension**

- Discover the Moon. Ask the students what they know about the Moon.
- Observe the Moon with the naked eye in the morning, when it is visible.
- Discover numbers and shapes using the objects in the box.

## **LEARNING AREAS**

- Making full use of language
- Acting, expressing themselves and understanding through physical activity
- Acquiring the first mathematical tools
- Exploring the world
- Bonus: Acting, expressing themselves and understanding through artistic activity

