



# SURVIVOR: MOON



TEAMWORK AND COMMUNICATION

## MISSION DESCRIPTION

Divide participants into teams. Each team represents a crew of astronauts who were forced to make an emergency landing 50 km away from their lunar base. The crew is safe but must survive the trek to the base. They can only carry a few supplies with them on their journey. The most critical items must be chosen from a list of 15 items that could help the crew survive until they reach the lunar base. Each team must analyze and then rank the items in order of importance for allowing them to safely get to the base. Each team will also write the survival benefit of each item and then present their results to the other teams. Each item has a numerical value. The team with the lowest score at the end of the activity wins. (See appendix for answers.)

Difficulty: **MODERATE**

Duration: **90 MINUTES**

Materials: **MINIMAL**

## MISSION PREPARATION

### TIMELINE

Breakdown	Duration
Introduction to lunar survival scenario & assign teams	15 minutes
Team discussion, ranking and reasoning	30 minutes
Present ranked list reached by consensus	15 minutes
Educator presents NASA's ranking with explanations	20 minutes
Each team compares their list with NASA's list and totals up the difference in scores	10 minutes
<b>Total</b>	<b>90 minutes</b>

### MATERIALS

- List of items that remained intact during an emergency landing on the Moon, 50 km away from the lunar base (see appendix)
- NASA's ranked list of items from the most important to the least important for survival on the Moon, including a brief explanation as to the importance of each item (see appendix)

## GOALS

Participants will need to come to a group consensus on the most critical items that will help them survive.

## OBJECTIVES

By the end of the activity, teams will be able to:

- Create and communicate arguments for a ranked list of items critical for lunar survival
- Collaborate with peers, including coming to agreements and trade-offs
- Think critically and prepare written arguments for their choices
- Present their choices and reasoning to their peers

# BACKGROUND

Countries from around the world are getting ready to send humans farther into our solar system, beyond the International Space Station. Nearly 400,000 km away from our planet, the Moon represents a crucial stepping stone in humanity's quest to travel onwards to Mars. Because the Moon is so far away, astronaut crews will have to act with more independence and autonomy than ever before.

# MISSION INSTRUCTIONS

1. Divide participants into teams of 4. Each team will represent a different space crew.
2. Provide background scenario to all the participants as described in the lesson description above.
3. Provide each team with a copy of Table 1: Compare Team Ranking with NASA's Ranking.
4. The teams will discuss and rank the items from the most important to the least important for survival. The team will also write an explanation in the second column of Table 1 as to why each item is important for survival.
5. After 30 minutes when all teams have completed their ranked list of all 15 items, groups present their list with the rationale for their selections. After all the teams have presented their results, provide copies of Table 2: NASA's Answers to each team.
6. Each team can write down NASA's rankings in the fourth column of Table 1.
7. Provide scoring to class:

For each item, mark the number of points that your score differs from the NASA ranking in the fifth column of Table 1, then add up the numbers in the fifth column. **The lower the total, the better your score.**

- — — — —
- 0–25:** excellent
  - 26–32:** good
  - 33–45:** average
  - 46–55:** fair
  - 56–70:** poor — suggests use of Earth-bound logic
  - 71–112:** very poor — better luck next time!
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Adapted from published article in July 1999 issue of NightTimes

<https://www.humber.ca/centreforteachingandlearning/assets/files/pdfs/MoonExercise.pdf>

[https://www.nasa.gov/pdf/166504main\\_Survival.pdf](https://www.nasa.gov/pdf/166504main_Survival.pdf)

**Table 1. Compare Team Ranking with NASA's Ranking**

<b>Team Ranking</b>	<b>Team Reasoning</b>	<b>Items</b>	<b>NASA's Ranking</b>	<b>Difference* (Team Ranking - NASA's Ranking)</b>
		Box of matches		
		Food concentrate		
		15 metres of nylon rope		
		Parachute silk		
		Portable heating unit		
		Small fire extinguisher		
		One case of dehydrated milk		
		Two 45-kg tanks of oxygen		

**Table 1. Compare Team Ranking with NASA's Ranking**

Team Ranking	Team Reasoning	Items	NASA's Ranking	Difference* (Team Ranking - NASA's Ranking)
		Stellar map		
		Self-inflating life raft		
		Magnetic compass		
		20 litres of water		
		Signal flares		
		First aid kit, including injection needle		
		Solar-powered FM receiver-transmitter		
<b>Total the difference column (disregard plus or minus differences)</b>				

\* Note: disregard plus or minus differences

**Table 2. NASA's Answers**

Item	NASA's Ranking	NASA's Reasoning
Box of matches	15	Completely worthless – there's no oxygen on the Moon to sustain combustion
Food concentrate	4	Efficient means of supplying energy requirements
15 metres of nylon rope	6	Useful in scaling Moon craters and tying injured together
Parachute silk	8	Protection from the Sun's rays
Portable heating unit	13	Not needed unless on the dark side
Small fire extinguisher	11	Possible means of self-propulsion
One case of dehydrated milk	12	Bulkier duplication of food concentrate
Two 45-kg tanks of oxygen	1	Most pressing survival need (weight is not a factor since gravity is one-sixth of Earth's – each tank would weigh only about 7.5 kg on the Moon)
Stellar map	3	Primary means of navigation – star patterns appear essentially identical on the Moon as on Earth
Self-inflating life raft	9	CO2 bottle in military raft may be used for propulsion
Magnetic compass	14	The magnetic field on the Moon is not polarized, so it's worthless for navigation
20 litres of water	2	Needed for replacement of tremendous liquid loss on the light side
Signal flares	10	Use as distress signal when the lunar base is sighted
First aid kit, including injection needle	7	Needles connected to vials of vitamins, medicines, etc. will fit special aperture in NASA spacesuit
Solar-powered FM receiver-transmitter	5	For communication with lunar base (but FM requires line-of-sight transmission and can only be used over short ranges)