ACTIVITY 3.1

AEROSPACE TEAM ACTIVITY: Survival on the Moon

If you were stranded on the Moon with a small amount of equipment, which items would matter most to you? This classic aerospace activity is included in the Great Start program to introduce new cadets to the Cadet Program's aerospace element and to show them that CAP members hold a common interest in aviation and space. Moreover, the activity challenges cadets to demonstrate the active listening and teamwork skills introduced to them earlier in Great Start.

Suggested Instructors

Lead Instructor. A cadet officer or NCO, or the unit aerospace officer can lead this exercise

Team Advisors. If possible, assign a cadet NCO to monitor each team

Duration

50 min

Objectives

1. Demonstrate problem-solving skills in prioritizing the equipment available in the scenario
2. Demonstrate principles of active listening when working with teammates
3. Demonstrate an ability to build a consensus and work together to present a joint solution

Equipment

Copies of the 2-page handout for "Survival on the Moon" (see following pages)

LESSON OUTLINE

1. Present the Scenario & Review the Instructions. (3 min)

Divide the class into small groups of 3-5 cadets. Assign a team advisor, preferably a cadet NCO, to each group. Read the scenario aloud, then read the activity instructions aloud.

2. Work the Problem. (15 min)

Allow the cadets 5 minutes to work the problem on their own. Then, allow the cadets 10 minutes to work the problem as a group.

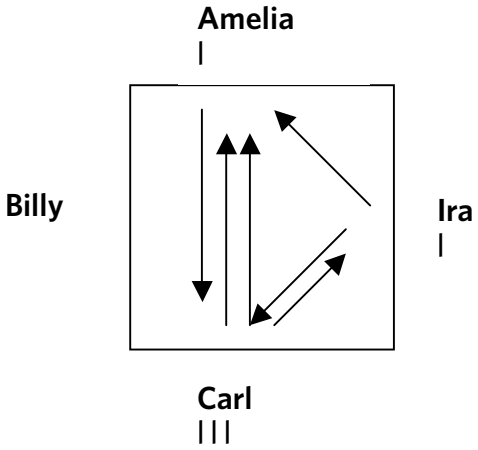
3. Share the Team's Solutions. (10 min)
Have each team share their rankings with the rest of the cadets. As they reveal how they ranked each item one at a time, have them also explain the rationale for their decisions.

4. Reveal the NASA Solution. (5 min)
Explain how and why NASA experts ranked each item. See page 65 for answers.

5. Reveal the Communications Matrix. (10 min)
Have each team advisor reveal their communication matrix, showing who talked to whom. Ask the cadets to analyze the matrix and draw conclusions about their sense of teamwork.

6. Tabulate Scores. (3 min)
Have the cadets tabulate their scores, as described in the cadets' handout. The Team with the lowest number of error points wins.

Special Instructions for Team Advisors
The team advisor has a clandestine purpose. They are to observe the team's discussion carefully, and as secretly as possible, make notes about who talked to whom. The diagram below, called a communications matrix, shows one possible way of tracking the group discussion. Arrows show individuals speaking to other individuals. Hash marks below an individual's name represent questions or statements that person directed to the group as a whole. The sample diagram below shows that Carl is doing most of the talking, and no one is interacting with Billy – a poor display of teamwork.



SURVIVAL ON THE MOON – Cadets' Handout

The year is 2025 and you are part of a small team traveling to the Moon. As your spacecraft enters lunar orbit, you spot the lunar outpost. This outpost has gown, having been built piece by piece during past missions. You are excited to see the outpost. It is located on a crater rim near the lunar south pole, in near-constant sunlight. This location is not far from supplies of water ice that can be found in the cold, permanently shadowed part of the crater. Suddenly, you notice that there is a problem with the thrusters. You land safely, but off course, about 80 kilometers (50 miles) from the lunar outpost. As you look across the charcoal-gray, dusty surface of the Moon, you realize your survival depends on reaching the outpost, finding a way to protect yourself until someone can reach you, or meeting a rescue party somewhere between your landing site and the outpost. You know the Moon has basically no atmosphere or magnetosphere to protect you from space radiation. The environment is unlike any found on Earth. The regolith, or lunar soil, is a mixture of materials that includes sharp, glassy particles. The gravity field on the Moon is only one-sixth as strong as Earth's. More than 80 percent of the Moon is made up of heavily cratered highlands. Temperatures vary widely on the Moon. It can be as cold as -193°C (-315°F) at night at its poles and as hot as 111°C (232°F) during the day at its equator. Survival will depend on your mode of transportation and ability to navigate. Your basic needs for food, shelter, water, and air must be considered. Your team has only the 15 items listed below. Which will be most important to you?

See reverse for instructions and scorecard.

INSTRUCTIONS

1. **Work Individually.** Rank the items below from 1 (most important) to 15 (least important). Record your answers in the "your ranking" column. Briefly note why you think each item is or is not important.

2. **Work as a Team.** You traveled to the Moon as part of small team. The team will need to reach a consensus on which equipment is most important to the team's survival. Listen well and work together. Record the team's answers in the "team ranking column."

3. **Listen** to how NASA experts ranked the equipment. Record their rankings in the NASA column.

4. **Compute Your Score.** Figure the difference between your rankings and the NASA rankings. Likewise, figure the difference between your team's rankings and the NASA rankings. (Example: Suppose you rank the matches as the #1 item and NASA ranks them #5. The difference is 4; put a "4" in the "error points" column.) Whichever team has the least number of error points wins.

Item	Notes	NASA Ranking	Your Ranking	Error Points	Team Ranking	Error Points
Box of matches						
Food concentrate						
50′ nylon rope						
Parachute silk						
Space blanket						
Signal mirror						
Lights with rechargeable solar-powered batteries						
Map of lunar surface						
Oxygen tanks (2)						
Self-inflating life raft						
Magnetic compass						
Purified water (5 gals)						
Spacesuit repair kit						
First aid kit						
Solar-powered, 2-way radio						
Totals						

SURVIVAL ON THE MOON – NASA EXPERTS' ANSWERS

FOR INSTRUCTOR USE ONLY

1. **Oxygen.** The Moon has no atmosphere. Without oxygen you will suffocate and die.

2. **Water.** Water is essential to all life. Astronauts need 3 gallons per day to function and survive.

3. **Food.** Of course you will need food, and this concentrate is lightweight and easy to carry.

4. **Radio.** The radio might allow you to talk with the Lunar Outpost and call for help.

5. **First Aid Kit.** Having a first aid kit handy is always a good idea.

6. **Map of the Moon.** This is your primary way to identify where you are and what you'll use to navigate.

7. **Spacesuit Repair Kit.** You can not afford to have any tears in your spacesuit.

8. **Life Raft.** Use the raft as a sled for carrying the bulky oxygen and water canisters.

9. **Space Blanket.** Temperatures vary widely on the Moon. A blanket can insulate the water and oxygen.

10. **Rope.** Use it to drag the life raft and to help you cross difficult terrain.

11. **Lights.** The lights will help you travel at night.

12. **Signal Mirror.** This can be used as a form of communication if the radio fails.

13. **Parachute Silk.** A parachute could be used to provide shade, or as a back-up sled to the life raft.

14. **Matches.** With little oxygen on the moon, the matches are useless.

15. **Compass.** There is no Moon-wide magnetic field, so the compass is useless.