

Survival Scenario:

The year is 2025 and your team are a space crew travelling toward the moon in the Orion spacecraft. Orion is a gumbdrop-shaped spacecraft designed to carry humans from Earth to the moon. Attached, or docked, to Orion is the Lunar Surface Access Module (LSAM), which you will use to land on the moon.

As your spacecraft enters the moons (lunar) orbit, you spot the lunar landing site. It is located on a crater rim near the moons south pole, which is in near-constant sunlight, 24 hours a day. This location is not far from supplies of water ice that can be found in the cold, permanently shadowed part of the crater.

After transferring into the LSAM and separating from Orion, you prepare to descend to the moon's surface. Suddenly, you notice that there is a problem with the thrusters. You land safely, but off course, about 50 miles from the lunar landing site. As you look across the surface of the moon, you realize your survival depends on either reaching the landing site or finding a way to protect yourself until the rescue party arrives.

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 moons 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% of the moon is made up of heavily cratered land. 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, ability to navigate, need for food, shelter, water, and air.

You are challenged to choose items that will help you and your team survive. You will find a list of 15 items available to you. Individually or with your team, rank these items from 1 to 15 according to their importance to you and your crew. Place the number 1 by the most important item and continue ranking the items to number 15, the least important. Beside each choice, briefly explain why you gave each item the rank it received and how you plan to use the item to help you survive.

Scoring:

For each item, mark the number of points that your score differs from the NASA ranking, then add up all the points i.e. if you rank something as 1 and NASA ranks 11 then your score is 10 for that item. Disregard plus or minus differences. The lower the total, the better your score.

0 - 25 excellent – 100% chance of survival

26 - 32 good – 75% chance of survival

33 - 45 average – 50% chance of survival

46 - 55 fair - 35% chance of survival

56 - 70 poor -- suggests use of Earth-bound logic, 20% chance of survival

71 - 112 very poor – you're one of the casualties of the space program!

Survival on the moon – STEAM Activity


Find the list of items on the next two pages.

| Item | Your Ranking | Group Reasoning | Ranking | and | NASA Ranking | Your Ranking | Group Score |
|-----------------------------|---|-----------------|---------|-----|--------------|--------------|-------------|
| Box of matches |  | | | | | | |
| Food Concentrate |  | | | | | | |
| 50 feet of nylon rope |  | | | | | | |
| Parachute silk |  | | | | | | |
| Portable heating unit |  | | | | | | |
| Two .45 caliber pistols |  | | | | | | |
| One case of dehydrated milk |  | | | | | | |

Survival on the moon – STEAM Activity

| Item | Your Ranking | Group Reasoning | Ranking | and | NASA Ranking | Your Ranking | Group Score |
|---|---|-----------------|---------|-----|--------------|--------------|-------------|
| Two 100 lb. tanks of oxygen |  | | | | | | |
| Stellar map |  | | | | | | |
| Self-inflating life raft |  | | | | | | |
| Magnetic compass |  | | | | | | |
| 20 liters of water |  | | | | | | |
| Signal flares |  | | | | | | |
| First aid kit, including injection needle |  | | | | | | |

Survival on the moon – STEAM Activity

| Item | | Your Ranking | Group Ranking and Reasoning | NASA Ranking | Your Ranking | Group Score |
|---------------------------------------|---|--------------|-----------------------------|--------------|--------------|-------------|
| Solar-powered FM receiver-transmitter |  | | | | | |
| | | | | TOTAL | | |