

### NASA Answers

A group of NASA scientists from the Astromaterials Research and Exploration Science (ARES) Acquisition and Curation Office were asked to answer these questions using their professional judgement and an average of their results has been taken. It is important to note that there is not one correct ranking and that justifications and explanations are more important. Survival on the moon depends most crucially on good teamwork and where a team who have argued, disagreed and wasted time on the moon, they are most likely to perish. The rankings and scientists' explanations for this activity have been presented below:

Item	Ranking	Expert Explanation
Two 100 lb. tanks of oxygen	1	With basically no atmosphere on the moon, oxygen (O <sub>2</sub> ) to breathe is the most pressing survival need. The average person needs about 0.84 kilograms (a little less than 2 pounds) of O <sub>2</sub> per day.
38 litres (10 gallons) of water	2	Though we believe there is some water in the form of ice on the moon, there is no liquid water. Water is essential to all life. Currently, each astronaut aboard the International Space Station (ISS) uses about 11 litres (3 gallons) of water daily.
Stellar map	3	With no other directional tools available, a map of the moon's surface is the most important means of finding your way from one location to another.
Food Concentrate	4	Although the food concentrate must have water added to be useful, it is lightweight and easy to carry, meeting a third basic need for survival.
Solar-powered radio receiver / transmitter	5	Hopefully people from the lunar outpost are looking for you while you are trying to reach them. A solar powered radio receiver-transmitter is important to maintain this communication.
50 feet of nylon rope	6	The nylon rope is useful in scaling cliffs or craters you may have to cross. To prevent injury or in case you cannot walk, rope is helpful for tying you to others.
First aid kit including injection needle	7	No matter where you are, a first aid kit is a good idea. Be sure you carry pain medication and medicine for infections.
Self-inflating life raft	8	The life raft makes a great sled for carrying the oxygen and water. CO <sub>2</sub> bottle in military raft may be used for propulsion.
Parachute silk	9	Parachute silk comes in handy as a backup sled to the life raft, or as shade.

Answer Key for Survival on the moon – STEAM Activity

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Item	Ranking	Expert Explanation
Signal flares	10	Use as distress signal when the mother ship is sighted or when near the outpost.
Two .45 calibre pistols	11	Possible means of self-propulsion.
One case of dehydrated milk	12	Bulkier duplication of food concentrate.
Portable heating unit	13	Not needed on the light side of the moon.
Magnetic compass	14	The moon has no global magnetic field, which makes a magnetic compass virtually useless.
Box of matches	15	Matches are virtually useless on the moon because there is little oxygen.