

# Mission Survival

Challenger Center for Space Science Education



## **Background Information:**

To survive in a hostile environment, basic human requirements must be met. Earth's atmosphere provides the air we need to breathe, atmospheric pressure that the human body requires to function, and protection from much of the harmful radiation from the Sun. On Earth, some basic human needs include food, water, shelter, and clothing. The body can go without food longer than it can go without water. Shelter provides protection from the elements such as extreme temperatures and inclement weather. Likewise, proper clothing allows humans to live and function in comfort. Usually, these needs are easily met. However, in extreme situations, humans must prioritize their needs in order to survive. Tools, resources, and skills may be necessary to obtain food and water or to construct proper shelter and make clothing. Communication can be key to survival as well. In a hostile environment, successful teamwork may be all that stands between the life and death of individuals.

## **Objectives:**

Students will:

- Discuss and reach consensus on items to include in a survival kit in an emergency situation.
- Decide, evaluate, and formulate problem solving skills to plan a course of action.
- Establish criteria for the contents of a survival kit.
- Identify hostile environmental elements to be overcome in Antarctica.
- Compare and contrast the hostile environment of Antarctica to other places on Earth or in the Solar System.

## **Overview:**

This activity is a classic way to generate discussion, problem solving, and consensus building around survival issues in a hazardous environment in the event of a hypothetical emergency situation. Students are asked what to do in the event they are stranded in Antarctica several days walking distance from base camp. The class must make a plan and prioritize those items needed for a survival kit.



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## **Management:**

This activity should take one class period to complete. You can break the class into small groups of five to six students (or whatever works for your class) and have teams share their solutions with the class, or do the activity as an entire class. The teacher should focus less on “the answer” than on promoting critical thinking and consensus building skills. Pay attention to the leadership that will emerge in the group work. It may provide you with some surprising insight into your students and impact how you assign them to roles for the Learning Center mission.

## **Reflection & Discussion:** (choose how you would like to further the discussion)

1. What do humans need for survival in a hostile environment?
2. What items are “nice to have,” but not essential?
3. Why is it important to have emergency plans in place?
4. What kind of emergency plans do you know in case of a fire, earthquake, or power outage?
5. What kind of emergency measures are on airplanes, cars, or in homes?
6. What was difficult about reaching consensus? What would make it easier next time?
7. Compare and contrast survival in Antarctica to planning to live on the Moon, Mars, or a long duration space mission.

The student work is on the following 5 pages→

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## **Scenario:**

Life in a hostile environment requires careful thinking and planning to meet human survival requirements. In many respects, Antarctica is an excellent training ground for a long duration, human mission on Mars. Like Mars, Antarctica is barren and typically very cold. Unlike Mars, Antarctica has air, atmospheric conditions fit for humans, and access to water. You are part of six-person crew on its way to Antarctica to collect meteorites, which are easily found in the white snow. Just short of base camp, the plane develops electrical problems and crashes. Miraculously nobody is seriously injured, but all radio communication has been permanently damaged. The pilot estimates that the team is approximately a five-day walk from base camp. Another plane with a second crew will be flying out to camp in two weeks.

## **Group Problem-Solving:**

**1.** Based on the scenario above, plan what you would do. Should you stay near the plane or head for the base camp? You must reach a complete consensus (you all must agree) on your answer. Write which you decide to do as a group, and why.

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2. The items below survived the crash. If you decide to head for base camp, you can only take what you can carry with you to survive until you can get help or be rescued. What items are essential for your survival kit? What *essential* items can the members of your group carry to base? As a group, decide which are really essential. Put an "x" next to each item.

- |  |   |
|--|---|
| <input type="checkbox"/> Parachutes (2)                                | <input type="checkbox"/> Batteries                                  |
| <input type="checkbox"/> Matches (1book)                               | <input type="checkbox"/> Can opener                                 |
| <input type="checkbox"/> Sleeping bags (2)                             | <input type="checkbox"/> Toothbrush and toothpaste                  |
| <input type="checkbox"/> Long underwear                                | <input type="checkbox"/> Backpack (1for each member)                |
| <input type="checkbox"/> Water (2 gallons)                             | <input type="checkbox"/> Kerosene (1gallon)                         |
| <input type="checkbox"/> Pick axe                                      | <input type="checkbox"/> First aid kit                              |
| <input type="checkbox"/> Flashlight                                    | <input type="checkbox"/> Wool blankets                              |
| <input type="checkbox"/> Candy bars (1box of 24)                       | <input type="checkbox"/> Sunglasses (1for each member)              |
| <input type="checkbox"/> Fruit (1crate of bananas)                     | <input type="checkbox"/> Chapstick                                  |
| <input type="checkbox"/> Campstove                                     | <input type="checkbox"/> Sunscreen                                  |
| <input type="checkbox"/> Dehydrated food (2 boxes of 4 dozen packages) | <input type="checkbox"/> Cassette tapes                             |
| <input type="checkbox"/> Scissors                                      | <input type="checkbox"/> Pocket video games                         |
| <input type="checkbox"/> Twine   | <input type="checkbox"/> Journal                                    |
| <input type="checkbox"/> Canned chili (2 boxes of 48 cans)             | <input type="checkbox"/> Pen  |
| <input type="checkbox"/> Mess kits (6)                                 | <input type="checkbox"/> Pocket knife                               |
| <input type="checkbox"/> Make-up compact with mirror                   | <input type="checkbox"/> Thermal jackets                            |
| <input type="checkbox"/> Flare gun                                     | <input type="checkbox"/> Compass                                    |
| <input type="checkbox"/> Portable radio                                | <input type="checkbox"/> Thermal gloves                             |
| <input type="checkbox"/> Thermal boots                                 | <input type="checkbox"/> Map  |
| <input type="checkbox"/> Hammer  | <input type="checkbox"/> Gun  |
| <input type="checkbox"/> Screwdriver                                   | <input type="checkbox"/> Thermal hats                               |
| <input type="checkbox"/> Nails & screws                                | <input type="checkbox"/> Ammunition                                 |
| <input type="checkbox"/> Duct tape                                     | <input type="checkbox"/> Tents (2 two-person tents, 10 pounds each) |
| <input type="checkbox"/> Collection bags                               | <input type="checkbox"/> Toilet paper (2 rolls)                     |
| <input type="checkbox"/> Shovel  | <input type="checkbox"/> Jewelry                                    |
| <input type="checkbox"/> Garbage bags                                  | <input type="checkbox"/> Magnifying glass                           |
| <input type="checkbox"/> Canteens                                      | <input type="checkbox"/> Paper plates                               |
| <input type="checkbox"/> Soap  | <input type="checkbox"/> Napkins                                    |
| <input type="checkbox"/> Washcloth                                     | <input type="checkbox"/> Cooler                                     |
|  | <input type="checkbox"/> Soft drinks (1case)                        |

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## Reflection & Discussion:

3. What items will you leave behind? Choose 5 to explain why you decided to leave them.

Item	Why You Left It

4. What items don't belong in the survival kit, but you would be willing to carry on a five-day walk to the base camp? Choose 3 and explain why.

Item	Why You Are Willing to Bring It



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5. Compare and contrast surviving in a hostile environment like Antarctica to surviving in other places on Earth or in the Solar System, such as the Moon, Mars, a space station, or on an extended mission (two year, roundtrip) to Mars.

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6. What was difficult about reaching a consensus? What would make it easier next time?

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7. Fill out the Venn Diagram below to compare and contrast survival in Antarctica to surviving on the Moon, Mars, or a long-duration space mission.

