

# FROM LOOKING AT STARS TO LIVING ON MARS



## HAZARD 5: HOSTILE OR CLOSED ENVIRONMENTS

### INTRODUCTION

A human journey to Mars, at first glance, offers an inexhaustible amount of complexities. To bring a mission to the Red Planet from fiction to fact, NASA's Human Research Program has organized hazards that astronauts will encounter on a continual basis into five classifications. Pooling the challenges into categories allows for an organized effort to overcome the obstacles that lay before such a mission.

For more information on the hazards of hostile or closed environments, watch the following video:

"Hazards of Human Spaceflight | Hazard 5: Hostile Closed Environments" (Length 3:05)

<https://safeYouTube.net/w/fMPX>

For students unable to access Safe YouTube links, the video is also available here:

<https://www.youtube.com/watch?v=LgGt03MjHfA&list=PLiuUQ9asub3RRA-BMh7wLsU7V6gUUSRwH&index=5>

### PROCEDURE

Read the description, in the first column below, of your group's assigned hazard. Then, brainstorm possible solutions to avoid or mitigate this hazard, and identify STEM skill sets that will likely be necessary to develop and implement these solutions. Record your ideas in the appropriate columns, and be prepared to share with the class.

Hazard Description	Possible Solutions	Necessary STEM Skill Sets
<p>A spacecraft is not only a home, it's also a machine. NASA understands that the ecosystem inside a vehicle plays a big role in everyday astronaut life. Important habitability factors include temperature, pressure, lighting, noise, and quantity of space. It's essential that astronauts are getting the requisite food, sleep and exercise needed to stay healthy and happy.</p>	<p><i>The quality of the air needs to be monitored constantly. Alarms should go off if any contaminants are detected.</i></p> <p><i>Since the astronauts will be in such close proximity, germs may be spread easily, so maintaining a clean environment is essential.</i></p>	<p><i>Math</i></p> <p><i>Biology</i></p> <p><i>Physiology</i></p> <p><i>Psychology</i></p>

	<p><i>Extensive recycling of resources we take for granted is also imperative: oxygen, water, carbon dioxide, even human waste.</i></p> <p><i>Providing a pleasant-looking environment is important. Astronauts should have plants and mood-enhancing lighting available to them.</i></p>	
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PROPRIETARY