

FROM LOOKING AT STARS TO LIVING ON MARS



HAZARD 2: ISOLATION AND CONFINEMENT

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 hazard of isolation and confinement, watch the following video:

"Hazards of Human Spaceflight | Hazard 2: Isolation & Confinement" (Length 2:54)

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

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

https://www.youtube.com/watch?v=FPinASEKA_I&list=PLiuUQ9asub3RRA-BMh7wLsU7V6gUUSRwH&index=2

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
Behavioral issues among groups of people crammed in a small space over a long period of time, no matter how well trained they are, are inevitable. Crews will be carefully chosen, trained and supported to ensure they can work effectively as a team for months or years in space.	<i>To address this hazard, methods for monitoring behavioral health and adapting/refining various tools and technologies for use in the spaceflight environment will likely be necessary. Another solution could be to provide opportunities for virtual social interaction, allowing astronauts to communicate with friends or family on Earth. Also, providing ample entertainment for the astronauts would help to promote engagement and social interaction on board the spacecraft.</i>	Biology Physiology Psychology

<p>On Earth we have the luxury of picking up our cell phones and instantly being connected with nearly everything and everyone around us. On a trip to Mars, astronauts will be more isolated and confined than we can imagine. Sleep loss, circadian desynchronization, and work overload compound this issue and may lead to performance decrements, adverse health outcomes, and compromised mission objectives.</p>	<p><i>NOTE: Research is also being conducted in workload and performance, light therapy for circadian alignment, phase shifting, and alertness.</i></p>	
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PROPRIETARY