

FROM LOOKING AT STARS TO LIVING ON MARS



HAZARD 4: LACK OF GRAVITY

Name _____

Class _____

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 a lack of gravity, watch the following video:

"Hazards of Human Spaceflight | Hazard 4: Gravity Fields" (Length 3:05)

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

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

<https://www.youtube.com/watch?v=f3-96ZbY5NA&list=PLiuUQ9asub3RRA-BMh7wLsU7V6gUUSRwH&index=4>

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>The variance of gravity that astronauts will encounter is the fourth hazard of a human mission. On Mars, astronauts would need to live and work in three-eighths of Earth's gravitational pull for up to two years. Additionally, on the six-month trek between the planets, explorers will experience total weightlessness.</p> | | |

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| <p>Besides Mars and deep space there is a third gravity field that must be considered. When astronauts finally return home they will need to readapt many of the systems in their bodies to Earth's gravity. Bones, muscles, cardiovascular system have all been impacted by years without standard gravity. To further complicate the problem, when astronauts transition from one gravity field to another, it's usually quite an intense experience. Blasting off from the surface of a planet or a hurdling descent through an atmosphere is many times the force of gravity.</p> | | |
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PROPRIETARY