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| **Activity 2.1 Living in Space** |

Introduction

The International Space Station (ISS) is a little “city in space” orbiting 250 miles above the Earth. About the size of two football fields, the space station is a place where people from around the world can live and study in space over long periods of time. Sixteen countries are spending billions of dollars, many years, and risking the dangers of space to experience a world without gravity so we can better understand gravity’s effects on plants, animals, and humans. The many modules of the station – from its laboratories to living quarters to power sources – will be constructed in space.

Living in Space is an online game which explores the idea of living in space. What do humans need in order to live in a space station? What is necessary for humans to work and thrive in space? By designing a space station, you examine a series of problems: How will you breathe? What will you eat? How will you produce power? While choosing the best solution for each problem, you learn how NASA and the Russian space agency have designed life support systems for their spacecraft. You will gain an appreciation for the Earth's environment and the many ways that it provides the things that we need to survive.

In this activity you will complete three levels of the simulation and print a certificate of accomplishment for each level. In Level 1 you will create a habitable space station so that your astronauts can survive in space. In Level 2 you will expand your space station’s facilities so your astronauts can work in space. In Level 3 you will explore self-sufficiency in space.

Equipment

* Engineering notebook
* Computer with Internet access

Procedure

As you play the Living in Space game, write the answers to the questions below as you learn them. The game can be found at: <https://www.childrensmuseum.org/legacy-games/cosmicquest/living.html>

1. What are the five basic requirements to make a space station habitable?

1. What do astronauts bring into space to breathe? Why is this the best choice?

1. How much water is necessary for an astronaut to drink while in space each day?
2. From the food list provided, list the foods you found that best fulfill the meal requirements.

1. Explain the method astronauts use to go to the bathroom in space.

1. What provides the best source of power to sustain life support systems in space? Why?

1. Who was the first American to fly in space?

1. How are astronauts able to provide enough water while on their missions?

1. List three ways astronauts exercise in weightlessness.

1. How do astronauts bathe?

1. What was the original mission of Skylab?
2. How do astronauts get a supply of fresh air over a long period of time? What are the requirements for one astronaut?
3. How do astronauts produce food while in space? List three reasons why this is a good method.

1. Give two examples of emergencies that can occur while in outer space.
2. Enter the Spacecraft section in the Field Guide to the Universe. Since the early 1960’s, dozens of robot spacecraft have explored the solar system, discovering much of what we currently know about our space neighbors. Fill in the chart below to describe ten of these missions.

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| Probe name | Probe location | Dates of mission | Purpose of mission |
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Conclusion

1. What information did you find most interesting while completing this activity? What would you like to know more about?