Making a Space Colony: Exploring the Basics of Survival in Space

Student Name: _____

Class: _____

Due Date: _____

Introduction

Imagine you are part of a team that is going to create a thriving space colony. Your task is to design a colony that can provide air, water, and food for its inhabitants. In this project, you will learn about the fundamental needs of human survival in space and develop critical thinking and problem-solving skills.

Section 1: Understanding Basic Needs

What do humans need to survive in space?

- Air: What do we need air for? Why is it essential for human survival?
- Water: What do we use water for? Why is it crucial for human survival?
- Food: What do we need food for? Why is it vital for human survival?

Activity 1: Sorting Game

Sort the following pictures or words into categories: air, water, and food.

- Picture of a lung
- Picture of a water bottle
- Picture of a sandwich
- Word: oxygen
- Word: hydration
- Word: nutrition

Section 2: Designing a Space Colony

Foundation Level

Draw a simple diagram of a space colony, labeling the basic needs (air, water, food) and how they are met.

Write a short paragraph explaining why each of these needs is essential for human survival.

Core Level

Design a space colony, considering the basic needs. Include a short paragraph explaining the systems you've included for air, water, and food.

Calculate the amount of air, water, and food needed for a small group of colonists for a week. Consider how these resources can be recycled or replenished.

Section 2: Designing a Space Colony (Continued)

Extension Level

Research and design advanced systems for air, water, and food production in a space colony, such as hydroponics or air recycling units.

Assign costs to the resources and systems in your colony. Manage a budget to ensure your colony remains sustainable.

Section 3: Writing a Colony Report

Write a short report (about 150-200 words) describing your space colony, including how you plan to provide air, water, and food for the colonists.

Section 4: Problem-Solving

Imagine your space colony is facing a challenge (e.g., a water shortage). Write a short story about how you would overcome this challenge.

Conclusion

In this project, you have learned about the fundamental needs of human survival in space and developed critical thinking and problem-solving skills. You have designed a space colony and written a report about how you would provide air, water, and food for its inhabitants.

Additional Resources

Books: "The Magic School Bus Inside a Space Suit" by Joanna Cole and Bruce Degen, "National Geographic Kids Ultimate Space Atlas"

Websites: NASA Kids' Club, Space.com

Documentaries: "How to Survive in Space" (BBC), "Space's Deepest Secrets" (Netflix)

Assessment

Understanding of basic needs: Can you explain why air, water, and food are essential for human survival in space?

Colony design: Does your colony include systems for air, water, and food production?

Report writing: Is your report clear and informative?

Problem-solving: Can you think critically about challenges in a space colony and propose solutions?

Parent/Guardian Notes

Support your child in designing their space colony, asking open-ended questions to prompt critical thinking about how basic needs can be met in a space environment.

Encourage your child to use a variety of resources (books, internet, documentaries) to research space colonies and the challenges of living in space.

Help your child manage their time effectively to complete the project within the estimated 30-40 minutes, ensuring they have enough time for each activity.