

Chapter 12

ENRICHMENT

Use with Section 3

Recent and Future Space Missions

Planning Space Colonies

Some scientists are planning colonies in space. In this activity you will analyze their ideas and consider the answer to a related problem. Read each idea carefully and then answer the questions.

1. One group has decided that a satellite colony should include 10 000 people. Thirty percent of the colony's population will produce materials and perform services for the colony's needs. Forty-four percent of the colony's population will produce materials for export to Earth.

- a. How many people are to produce materials and perform services for the colony? _____
- b. How many people are to produce materials for export to Earth? _____

Problem: Why do you suppose 26 percent of the colony's population is unaccounted for in the production of materials and their performance of services? _____

2. One design for a space colony is a large doughnut-shaped structure. The "doughnut" would be spun to give people inside a sense of gravity like that on Earth.

- a. If 60 percent of the inside volume of the structure can be inhabited and the total volume of the structure is 29 000 000 cubic meters, what is the actual volume that can be inhabited?

- b. What would be the average volume of living space for each of the 10 000 people? _____

Problem: Think of necessary human activities. Describe one way designers might use space in the colony very efficiently for one or more human activities. _____

3. It's suggested that each person in the colony will need 1.7 tons of material from Earth each year. Also, it's thought that to help people avoid boredom, half of the people in the colony will return to Earth each year.

- a. How much material would be needed by 10 000 people in one year? _____

- b. How many of the 10 000 people would be rotated with people from Earth each year? _____

Problem: If you were permitted only 50 kilograms for your personal belongings (excluding food, furniture, and your space suit), what would you take with you to spend a year as a space colonist? _____