

Chapter 12

CRITICAL THINKING

• Exploring Space

Students and the Space Program

Have you ever heard of Todd Nelson? He made news in 1982 when he was a high school student from Minnesota. He became the first student to have an experiment carried into space by a space shuttle. He had devised an experiment to determine the effect of space travel on the behavior of bees, moths, and houseflies.

On March 22, 1982, when *Columbia* was launched for the third time, it carried the bees, moths, and houseflies for Todd's experiment. When the shuttle returned to Earth, Todd and professional scientists studied moving pictures of the insects. The bees seemed to have been most affected by the weightlessness of space. Some frantically flapped their wings but were unable to fly. The moths adapted better, and the houseflies seemed almost totally unaffected.

Astronauts on the third *Skylab* mission were accompanied by pets Anita and Arabella. Judith Miles, a student from Massachusetts, was responsible for these pet spiders joining the crew. Judith Miles's experiment was designed to study the effect of space on the spiders' ability to make webs. Anita and Arabella performed well in space. At first, their webs were poorly woven. Soon, however, the spiders adapted to space travel and were weaving webs that were almost perfect.



Todd and Judith were just two of many students who developed experiments that were conducted in space. Other experiments included the growth of crystals, the effect of space travel on plants, the reaction of liquids in space, and the coordination of astronauts in space. Some

student experiments were so successful that professional scientists developed follow-up work for later missions.

Today, students are participating in the space programs in other ways, too. Some students interested in learning about space projects or becoming astronauts spend part of their summer vacations in space camps. Other students have learned about space programs through the Challenger Center for Space Science Education. At the center and the camps, students spend several days learning about how the space shuttle works. They learn about spacecraft operation and design, the jobs available in the space industry, and the need

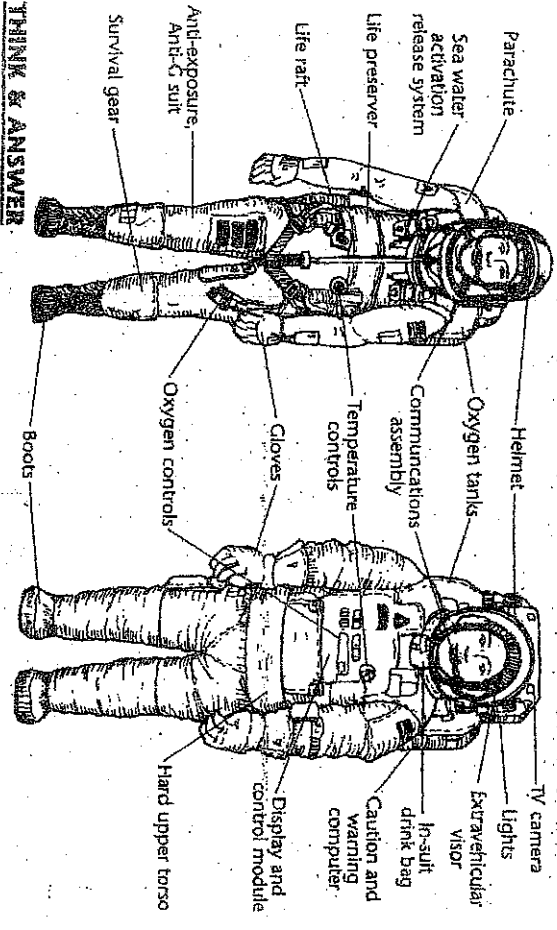
for teamwork in the space program. The students also have the opportunity to undergo some of the training that astronauts experience. They eat space meals, and they take control at flight simulators. The students participate in discussions of future space programs, including the development of a new space station and a Mars mission.

Applying Critical Thinking Skills

1. Why might NASA be willing to perform student-developed experiments in space?
2. Could there have been any danger to the astronauts if Todd Mitchell's bees had escaped from their containers?
3. Space camp training can include rigorous physical and intellectual exercises. Why might a student want to spend part of his or her summer at one of the camps?

A Suitable Suit

Launch Entry Suit (LES) Extravehicular Mobility Unit (EMU)



THINK & ANSWER

- 1. What are some things both suits have? _____
- 2. What are some things the LES has that the EMU doesn't? Why? _____
- 3. What are some things the EMU has that the LES doesn't? Why? _____
- 4. Why does the LES have a parachute or a life raft, but not the EMU? _____
- 5. Why does the EMU have a TV camera, but not the LES? _____
- 6. Which suit looks stronger? _____ More complicated? _____
- 7. More comfortable? (Which could you sit down in?) _____

Name _____

The Perfect Astronaut

Before men and women fly in space, they spend years in training and are very thoroughly interviewed to make certain they are well-equipped for the challenges and dangers of space travel. Think carefully about what makes a person well-suited for this unusual profession. Is it their knowledge, training, certain personality traits, or some combination of these?

- A. In your opinion, what are the top ten characteristics/qualifications of the perfect astronaut?
 1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____
 10. _____
- B. If you were interviewing prospective candidates, what ten questions would you most like to ask them?
 1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____
 10. _____