

Women In Space

H50

Teachers's Guide

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WHAT IS IT LIKE TO BE AN ASTRONAUT?

Competition works a driving force to reach goals also, as demonstrated by the space race and the successful landing on the moon. The competition of the space race cost a lot of money. However, it accomplished the largest feat in the history of mankind: man landed on the moon. By international cooperation with the Russians on the Shuttle-Mir docking missions, we had access to medical information that helped us. By international cooperation with a number of countries on the International Space Station, we saved money. It is good to keep in mind that there are different options to attacking goals.

1. Your personal life would be much busier. You would have to prioritize your time.

2. Potential answers. Learning how to fly the space shuttle.

Learning the various systems of the space shuttle. Preparing for unexpected problems that could occur. Understanding the payloads. Understanding the experiments. Learning about the space station. Training underwater to simulate weightlessness.

3. There is a lot of noise and vibration. Once space is reached, there is weightlessness. Launch is nervous and scary because thousands of parts have to hold together.

4. Potential answers. Weightlessness. Floating. Jumping. Acrobatics. View of Earth and stars. New adventure. Being in the news.

5. Potential answers. Fun. Like floating or flying.

Note. Astronauts train in large swimming pools, but obviously there's a big difference between a swimming pool and weightlessness. NASA also has a "vomit comet", which is a plane that simulates weightlessness by going into free fall for a few seconds. Of course, there's a big difference between a "vomit comet" and floating in space.

6. Dr. Kathryn Sullivan raised the interesting point that she had to be so focused on what she was doing, there was not much time to look at the sights, or worry about the dangers. She also mentioned that "up" and "down" are arbitrary in space. If you look at your feet, your whole perspective could change, and "down" can become "up", and vice-versa.

7. The blood rushes to your head, and fills out the wrinkles.

8. Dr. Mary Cleave likened it to camping. Astronauts take sponge baths so that the water doesn't go all over the place.

4. Yes.

Comment. There is a lesson to be learned here. People can use personal accomplishments to increase self confidence and reduce shyness.

5. Yes.

6. Good health, intelligence, decision-making skills, and attention to detail.

7. Answers are personal, and will vary based on personal opinion. Good discussion item.

8. Answers will vary, depending on the desire to be an astronaut.

Comment. This is an opportunity to discuss the value of money versus other things in life. Money isn't everything. Dr. Rhea Seddon has more prestige as an astronaut with a smaller pay check, than a doctor with a larger pay check. People often measure themselves with money, and if they focus too much on money, they can miss some of the more important things in life.

9. Answers will vary depending on opinion. As Challenger proves, there are risks to flying in space, so maybe for safety reasons, NASA should not allow civilians to fly in the Space Shuttle.

10. Potential answers:
A) During re-entry, if the tiles fall off, the heat of re-entry could burn through the bottom of the space shuttle.
B) There could be a Challenger like explosion.

11. Answers are personal, and will vary based on personal opinion. Good discussion item. Obviously, the astronauts are willing to face the risk, or they wouldn't be there.

12. Answers are personal, and will vary based on personal opinion. Good discussion item.

13. Potential answers: fear, nervousness and pride.

14. The space program has demonstrated that both cooperation and competition are useful ways of achieving goals.

Comment. The use of the space program of both cooperation and competition has lessons on how we can approach our goals in life. We can compete or we can cooperate. Sometimes, through cooperation, we can reach goals through our combined efforts.

QUESTIONS FOR ESSAYS OR DISCUSSION

On some of these questions, there are no real right or wrong answers. Different people will have different opinions. The value is in discussing the subject, and stimulating thought.

THE FUTURE

1. What do space flights promise mankind?
2. Do you think there is a potential for space tourism?
3. Do you think we will ever colonize the Moon or Mars?
4. What do you think a space colony would look like?

SCIENCE

1. When you look at the earth from space, can you see national boundary lines?
2. What is the future of medical research in outer space?
3. Dr. Bonnie Dunbar spent 13 months in Russia training as a back-up crew member to Norm Thagard, the first American to fly aboard the Russian Soyuz rocket and live on the Russian space station Mir. Dr. Bonnie Dunbar was on the first and eighth Shuttle-Mir docking missions. What is the purpose of the Russian-US joint Shuttle-Mir docking missions?

4. After being an astronaut, Dr. Kathryn Sullivan did a stint as chief scientist at NOAA. What is NOAA and what does NOAA do?

THE RIGHT STUFF

1. Do you agree with Dr. Sally Ride that there are few doors closed to women? Can women really pursue doing what they want to do? Are there really opportunities for women in all fields? Is there equality of women in the work force? What about the stereotypes? Are there certain types of work for men only? Are there certain types of work for women only? Do women also have the right stuff? Can women do most jobs that men do?
2. What is the value of integrating women into the astronaut program?
3. What does it take to become an astronaut, whether male or female?
4. Astronaut Dr. Anna Fisher said being an astronaut gave her

more self confidence. She is less shy. Do you think that personal accomplishment is a way of getting self confidence and reducing shyness?

5. Dr. Mary Cleave likes science fiction and likes to read. Some people are over-achievers. Some are extroverts. Some are introverts. Some are technical oriented. Some like working with people. Are these good qualities for being an astronaut?
6. What are other good qualities for an astronaut to have?
7. Do you think NASA should allow civilians to fly in the Space Shuttle? Would you go?
8. Dr. Margaret Rhea Seddon took a pay cut to be an astronaut. Would you take a pay cut to be an astronaut?
9. Astronauts are out in a hostile environment where their survival depends on hardware functioning properly. What are some of the dangers of space?
10. Dr. Judith Resnik was the second American woman astronaut. Unfortunately, she was lost in the Challenger accident, along with the first U.S. civilian in space, teacher Christa McAuliffe. Would the dangers keep you from going into space?
11. What do you think about the idea of a teacher in space?
12. How would you feel if one of your parents was an astronaut?
13. There is a recent trend towards international cooperation in space, as opposed to the competitive space race which landed men on the moon. What are your feelings about competition vs. cooperation in reaching goals in life?

WHAT IS IT LIKE TO BE AN ASTRONAUT?

1. How would being an astronaut affect your personal life?
2. What do you think training would be like?
3. What is launch like?
4. What do you think would be fun about flying in space?
5. What do you think the experience of weightlessness is like?
6. Dr. Kathryn Sullivan was the first woman to do a space walk. What do you think a space walk would be like?

7. Why do you tend not to have wrinkles in space?
8. How do astronauts meet personal needs when up in the space shuttle? How do astronauts do things like brushing their hair, washing, eating?

ANSWERS

2. Research long term adaptation to weightlessness to support manned flight for long times, such as a trip to Mars. This would include researching calcium loss in bones, and researching the ability of the heart to recover from long times at weightlessness.
1. No.

SCIENCE

4. Answers are limited by the imagination.
Comment. This might be the basis of an art contest.
3. It is possible if we ever decide to do it, and decide to spend the large sums of money it would take to do it.

2. The market is there. As Dr. Bonnie Dunbar points out, space flight will become safer and more affordable. When space flight is safer, and more affordable, there will be space tourism.
3. It is possible if we ever decide to do it, and decide to spend the large sums of money it would take to do it.

THE FUTURE

1. Dr. Mary Cleave said that space flights promise mankind the future. Space flight is our future. It is part of the human race to want to push back the limits and move forward. The Mission to Earth program of satellites helps us understand our planet. Space flights help medical research, and they help technology.

On some of these answers, there are no real right or wrong answers. Different people will have different opinions. The value is in discussing the subject, and stimulating students to realize they have more options than they realized.

3. 1) Education, especially in math and sciences. Most women astronauts have education in the sciences, and many have PhDs.
2) Being a pilot helps. Many astronauts were pilots before becoming astronauts.
3) Dedication. Perseverance. Courage. Desire. Drive.
4) Contact the NASA web site to get information on how to become an astronaut. Read astronaut biographies on the NASA JSC website to see what backgrounds were successful in getting into the astronaut program.
2. A) Fairness: women can do the same job, so give them the same chances. It would be discriminatory not to. Competent women exist; they should be given the same chance as men.
B) Women astronauts are a good role model for women. Women have proven that they have what it takes to be astronauts. If women can become astronauts, there is no reason they couldn't be in any other field also.

Education helps realize some of these options. are more options than getting married and having babies. you doing what you want to do with your life. Certainly there want. There are few closed doors. Stereotypes should not limit what they should explore doing what they

THE RIGHT STUFF

4. NOAA studies the ocean, earth's atmosphere, space atmosphere, and makes weather predictions.
3. A) There is a large body of Mir scientific data about the human body. This data includes calcium loss in bones, the immune system, the blood system, and psychology. This data helps understand diseases on the ground.
B) The international cooperation also helped the United States prepare for the International Space Station.

Note. Dr. Sally Ride was the first American woman to go into space in 1983. The first woman in space of any nationality to go into space was a female Russian cosmonaut, named Valentina Tereshkova. She went into space June 16, 1963. However, the Russians did not put another woman into space until 1982, 19 years later.

1) How to become an astronaut is at: <http://spaceflight.nasa.gov/outreach/jobsinfo/astronaut.html>
2) Astronaut biographies are at: <http://www.jsc.nasa.gov/Bios/>