Teacher's Resource Guide

MISSION TO MIR

AN IMAX® EXPERIENCE™

LOCKHEED MARTIN

Introduction for Teachers

Mission to Mir gives students the opportunity to soar into space and experience life aboard the Russian space station Mir. This fascinating giant-screen film is presented by Imax Corporation and Lockheed Martin Corporation in association with the Smithsonian Institution's National Air and Space Museum and with the cooperation of the National Aeronautics and Space Administration (NASA). On behalf of the film's sponsors, your local IMAX® theatre is proud to present a resource guide for use in conjunction with this unique film. The guide will help teachers prepare students to view the film and to follow up with discussions and activities. The guide is intended as a classroom supplement for elementary and middle school grades, and is consistent with U.S. National Science Standards published by the National Research Council.

The material is flexibly designed, and teachers may modify and duplicate the copyrighted materials to suit their students' needs. Activities have been set up as double-page spreads. Left-hand pages contain materials and suggestions for the teachers; right-hand pages have been designed as reproducible student worksheets. Teachers will find responses to questions in all four activities within the Facts In Brief section. Also included in that section are definitions of key terms and concepts.

We hope this information will enhance your viewing experience of *Mission to Mir*.

Film Synopsis

As the millennium approaches, a new partnership is being forged by former rivals. NASA astronauts and Russian cosmonauts are working and living together 200 miles above Earth on board the Russian space station Mir. In *Mission to Mir*, IMAX cameras have captured the excitement and emotion of such dramatic events as the breathtaking docking of space shuttle Atlantis with space station Mir.

Filmed in space and narrated in part by the astronauts, this unprecedented giant-screen tour of Mir gives viewers a unique look inside the weightless home in space that has been occupied by astronauts and cosmonauts since 1986. Blending historical footage with breathtaking live-action shots, the larger-than-life film illustrates the friendship forged by the former Cold War rivals as they begin working together in orbit. The film focuses on the success the two nations have found by cooperating rather than competing in the 'race to space'.

Mission to Mir takes viewers behind the scenes of the Russian space program, which, only a few years ago, was completely unknown to the outside world, and to Star City where Russians and Americans together are preparing for upcoming missions. Audiences thrill to a thunderous launch at Baikonur; experience the intensity of a Soyuz capsule's 'hard landing,' witness the in-orbit drama of the Mir-Shuttle rendezvous and take part in Shannon Lucid's triumphant return from Mir.

American astronauts Charlie Precourt, Bonnie Dunbar and Greg Harbaugh, along with Russian cosmonaut Gennady Strekalov, sing "Moscow Nights" on board space station Mir.

Table of Contents

The docked space shuttle Atlantis as viewed from the space station Mir.

Program Objectives

- To build appreciation for space exploration and related studies.
- To help students better understand the history of the space race and appreciate recent collaborative efforts among astronauts, engineers and scientists from Russia, America and other nations.
- To help students understand human physical needs related to space exploration.
- To help students practice written and oral communication skills and strengthen listening skills.

Target Audience

This program is designed for use with students aged 8-14.

Pre-Screening Discussion

1. Locate the former Soviet Union on a world map and compare its land mass to that of the United States. Ask students to share what they already know about the former Soviet Union and how Russian-American relations have changed in recent years. What was the Berlin Wall? What happened to it? Can students tell some ways in which this has affected world politics?

2. Ask students if they recognize the name Shannon Lucid. Explain that the film *Mission to Mir* shows scenes of this female astronaut during her record stay aboard that space station. Ask if students can name the first American woman astronaut. (Answer: Sally Ride.) Remind students that many astronauts and space scientists are women.

3. Ask students whether they would like to visit a space station. Explain that, although only astronauts are now allowed aboard space stations, it may one day be possible for civilians to visit and live on a station in space. Ask students to brainstorm a list of questions they would ask an astronaut returning from the space station if they were reporters.

Post-Screening Discussion

1. Compare students' reactions to the film with their pre-screening expectations. What new things did students observe about life in space? What surprised them? Were any of their questions from Pre-Screening Discussion Question 3 above answered in the film?

2. Ask students what qualities they think it would take to spend months in space with other astronauts—including astronauts from other countries. In addition to being healthy and good at one's particular science specialty, what other characteristics does it take to ensure a successful mission?

3. Discuss: Why is exercise so important aboard a space station?

Mission to Mir

Facts in Brief

Mir Through the Years

The Russian space station Mir was launched on February 20, 1986, by the Soviet Union. The name *mir* is a Russian word meaning 'peace'. The Mir space station is a modified version of the Salyut stations previously launched by the Soviet Union. The first space station, Salyut 1, was launched on April 19, 1971. Since then, Russians have lived and worked aboard seven different orbiting space stations, including Mir, the first crewed space station. Russia holds the endurance record for humans in space. In 1995, Valen Polyakov, a physician cosmonaut, set a new space record for 14 months onboard Mir.

Over the years, with the addition of several space modules, the size of Mir has greatly expanded. Mir includes a main living/working area, two private compartments and ports for docking arriving space vehicles (like Atlantis, which brought Astronaut Shannon Lucid to Mir) as well as additional modules designed for different purposes. The Mir Base Block is the control center for the entire space station. Spektr is an Earth-monitoring module. It has attached to it the European Space Exposure Facility, which is used to study particles in low Earth orbit. Kvant 1 is the astrophysics module and provides information for research into the physics of active galaxies, quasars and neutron stars. Kvant 2 supports Earth observations and biological research. Kristall is used for material processing research, while the Priroda module is used to monitor remote sensing experiments. Priroda also contains spectrometers for measuring ozone and aerosol concentrations in the atmosphere.

Before the break-up of the Soviet Union, Mir was visited by several teams of cosmonauts. Since then, the expense of maintaining the space station has partly been met by fees that other nations, including the United States, pay to fly their own astronauts aboard it.

The Challenge of Docking in Space

One of the things students will view in *Mission to Mir* is an actual space docking. Linking the 100-ton space shuttle to the 100-ton Russian Mir space station is a bit like "docking with a porcupine," according to one astronaut. Not only are there all sorts of modules, solar panels and vehicles to avoid, but the whole process must be carried out carefully and very, very slowly—at barely more than an inch per second during the final approach. The history of Mir is evident in the docking mechanisms used, which trace their ancestry to the Apollo/Soyuz missions of the 1970s. Today's astronauts spend hundreds of hours practicing in simulators before ever attempting a real docking in orbit.

A Woman's Place

One of the astronauts portrayed in *Mission to Mir* is Shannon Lucid, who set a record with her extended stay aboard the space station in 1996. Born in Shanghai, China, Shannon Lucid regards Bethany, Oklahoma, as her hometown. She attended the University of Oklahoma and obtained her doctorate in biochemistry there in 1973. She was selected as an astronaut in 1978. One of a number of women astronauts, Lucid's first mission was aboard the space shuttle Discovery in June 1985, followed by flights on Atlantis in 1989 and 1991, and a highly successful medical-research mission on Columbia in 1993. Shannon Lucid arrived on Mir on March 24, 1996, and did not return to Earth until September of that year. As a child, Lucid was discouraged by one of her teachers from dreaming of a career in space exploration because she was a girl. Today's young women can look to pioneers like Shannon Lucid and Sally Ride for inspiration as astronauts and space explorers.

Space station Mir as viewed from the space shuttle Atlantis just prior to docking.

Making the Film

Mission to Mir was filmed by the astronauts themselves during four trips to the space station. Imax Corporation trained eight astronauts to operate the special IMAX camera in order to obtain the footage. Students might be interested to know that the IMAX cargo bay camera (ICBC) used for shooting the exterior scenes of Mir weighs 176 pounds. The smaller, in-cabin camera weighs 85 pounds. Although weightlessness lightens the load for the camera operators, the in-cabin camera—about the size of a small microwave oven—is sometimes difficult to manipulate, given the cramped space and various items of equipment that crowd the limited working area of Mir.

Technology Transfer

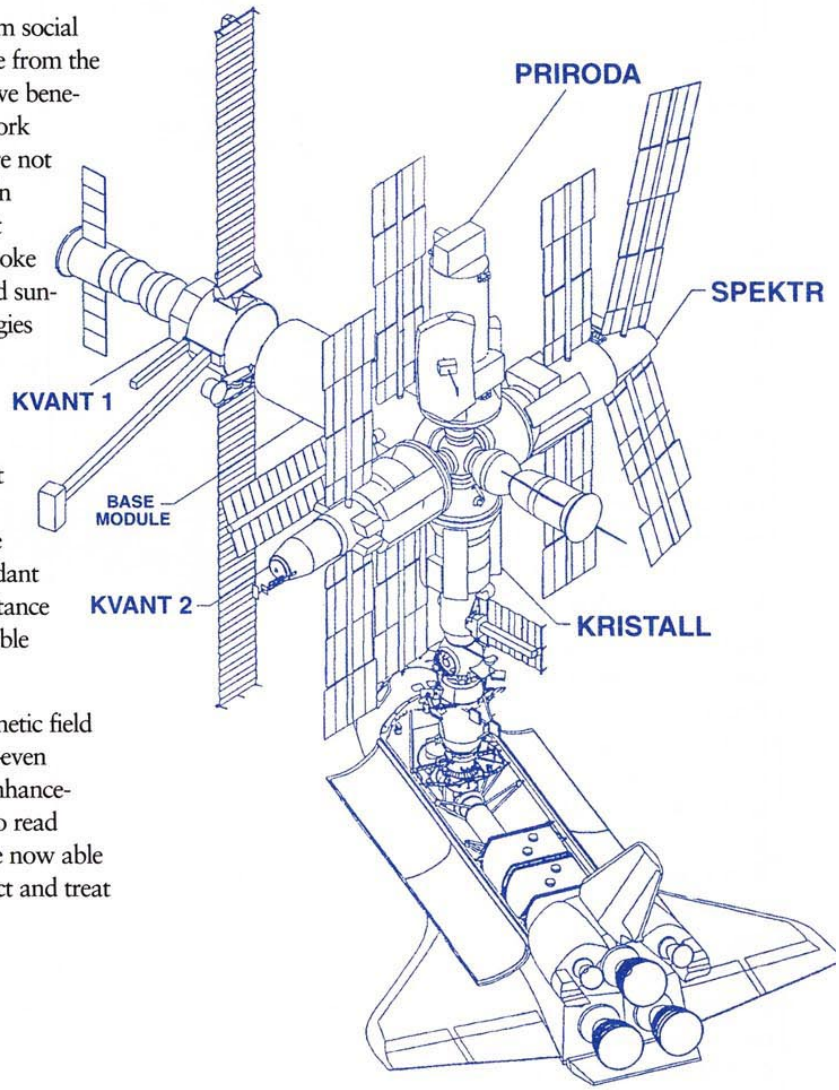
There are many benefits of space exploration–from social to technological and scientific achievements. Aside from the adventure of exploring the unknown, humans have benefitted from the vast satellite communication network which links the world. Although some of them are not as obvious as others, space research has resulted in many indirect breakthroughs, called spinoffs, that affect our everyday life. CAT scan equipment, smoke detectors, cordless power tools and even polarized sunglasses came about as a result of NASA technologies developed for the space program.

Aerospace technology has contributed to the development of a wide variety of products from wheelchairs to water recycling to scratch-resistant plastic. For instance, fire prevention is especially important onboard the Mir space station and the space shuttle. Research into developing fire-retardant materials has resulted in a new, lightweight substance that is extremely slow to ignite. Today it is available commercially.

Magnetic Resonance Imaging (MRI) uses a magnetic field and radio waves to see inside the human body—even inside bones. By applying computerized image enhancement technology that was originally developed to read Earth resources satellite photographs, experts are now able to create 'maps' of the human body to help detect and treat disease.

To create a better wheelchair, NASA Langley Research Center joined forces with the University of Virginia's Rehabilitation Engineering Center. Researchers used aerospace computerized structural analysis techniques and aerospace composite materials to arrive at a new design that weighs half as much as a traditional wheelchair, yet offers the same strength and durability.

For a number of years, the National Space Technology Laboratories have been conducting research on the use of aquatic plants known as water hyacinths for the treatment and recycling of waste water. The technique that has resulted from that research is now used as a means of purifying water by a number of American cities and towns.



Activity One

Countdown into History

Objectives: To provide an historical framework for understanding events that led to the establishment of the Mir space station and Russian-American cooperation.

I. Introduce the activity by asking students to share what they already know about the early years of space exploration. Do the names Sputnik, Apollo and Atlantis have meaning for them? As preparation for completing Part I, have students conduct library and on-line research to learn more about events leading up to the development of the Mir space station and cooperation between two former space rivals. Students can also gather information from older relatives and friends who recall these events. After students have found out more about early space history, distribute the activity sheet and have them complete Part I. Answers: 1. C, 2. F, 3. H, 4. D, 5. E, 6. I, 7. G, 8. J, 9. B, 10. A.

Cosmonaut Yuri Gagarin

Astronaut John Glenn

II. Use this activity to help students develop a chronological understanding of events leading up to the joint mission of Mir and as preparation for completing Part II of theactivity sheet.

Preparation: Make ten 8 1/2" x 11" cards from paper or poster board. Each card should have an event listed on one side and the date when it occurred on the other side. Use broad felt-tipped markers to label the cards as follows:

Card 1: Sputnik I launched/October 4, 1957
Card 2: Explorer I launched/January 31, 1958
Card 3: NASA formed/October 1, 1958
Card 4: Yuri Gagarin makes first manned earth orbit/ April 12, 1961
Card 5: JFK says U.S. will put a man on the moon/ May 25, 1961
Card 6: John Glenn becomes first American to orbit Earth/ February 20, 1962
Card 7: Neil Armstrong does first moon walk/ July 20, 1969
Card 8: Apollo-Soyuz has successful docking/July 17, 1975
Card 9: Mir space station launched/February 20, 1986
Card 10: Shannon Lucid returns from Mir/ September 26, 1996

1. Explain that students are going to take part in an activity that demonstrates when some early space exploration events took place. Ask 10 students to come to the front of the room. Give one card to each. Ask them to hold their cards so that the events are showing.

2. Ask seated students, one at a time, to verbally direct those who are standing to form a row with the earliest event at the far left, the most recent event at the far right, and the remaining events in order between the two. Allow several different arrangements of the row to be made.

3. See if the seated students can reach consensus on the order of the row. Then, ask the standing students to put themselves in the correct order by turning over their cards so that the dates show, and to arrange themselves accordingly. Have students demonstrate how much they recall from the activity by completing Part II of the activity sheet. Answers: 1. J, 2. A, 3. C, 4. B, 5. E, 6. D, 7. F, 8. H, 9. I, 10. G.

III. Have students name some 'firsts' in space history. (Examples include Yuri Gagarin—first man to orbit Earth, Sally Ride—first American woman to travel in space, and Neil Armstrong—first person to walk on the moon.) Then have students think about what space 'first' they would like to accomplish and complete Part III of the activity sheet.

Related Activity: As a student, young Shannon Lucid was discouraged from becoming a rocket scientist because she was female. This, however, did not stop her. Have students research the biographies of prominent women astronauts and scientists and share their findings with the rest of the class in an oral or written report. Possible subjects include: Sally Ride, Maria Mitchell, Rachel Carson, Jane Goodall or Marie Curie, among others.

I. The film *Mission to MIR* vividly demonstrates the results of the cooperation and dedication of many people. How did Mir become a reality? The path wasn't always easy. Look back at some key events in space history. Match up the name of each example with the correct description.

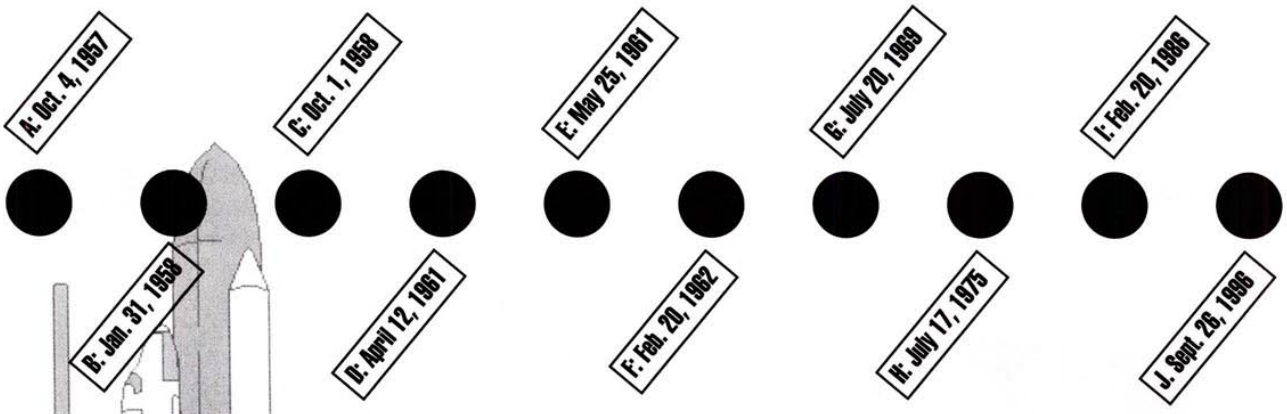
Examples

1. _____ Sputnik I
2. _____ NASA
3. _____ Yuri Gagarin
4. _____ John Glenn
5. _____ Apollo 11
6. _____ Neil Armstrong
7. _____ Apollo-Soyuz Test Project
8. _____ Mir
9. _____ Atlantis
10. _____ Sally Ride

Descriptions

A. First American woman astronaut
B. American space shuttle
C. First space satellite (Soviet Union)
D. First American to orbit the earth
E. First manned lunar landing mission
F. U.S. national space program
G. First joint space mission involving the U.S. and Russia
H. First man to orbit the earth (Soviet Union)
I. First man to walk on the moon
J. Russian space station

II. It is hard to imagine that the space program that led to the Mir mission is less than 50 years old! In front of each event below, write the letter that tells where the event should go on the time line.



1. _____ Astronaut Shannon Lucid returns after 188 days in space.
2. _____ Sputnik I launched
3. _____ NASA formed
4. _____ Explorer I launched
5. _____ President John F. Kennedy announces U.S. will put man on the moon.
6. _____ Yuri Gagarin makes first manned earth orbit
7. _____ John Glenn becomes first American to orbit Earth.
8. _____ Apollo-Soyuz Test Project: successful docking
9. _____ Mir space station launched
10. _____ Neil Armstrong walks on the moon.

III. There are plenty of 'firsts' in the history of space exploration: the first person to orbit the earth, first person to walk on the moon, first American woman astronaut! If you could explore space, what 'first' would you like to go down in history as being? On the lines below, write your choice and the reason for it.

_____

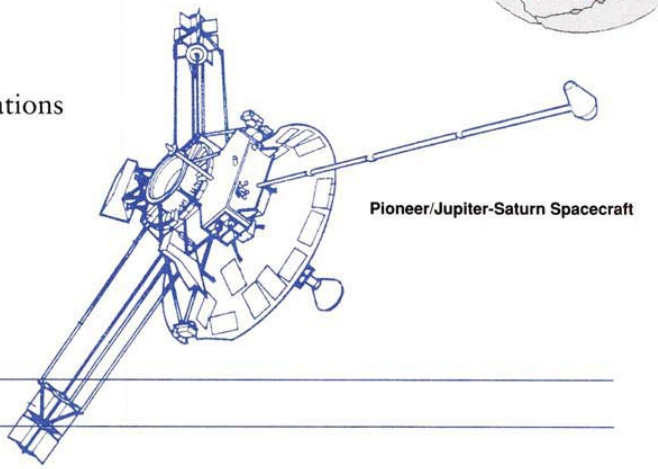
_____

_____

Activity 2: A Race that Everybody Wins

I. You don't have to live on a space station to see the rewards of cooperation. When nations work together toward a goal like exploring space, there are plenty of benefits. From the list below, choose one benefit of space cooperation and tell how it helps people.

- Sharing the results of research/experiments
- Pooling money for research/exploration
- Sharing technology–such as satellite communications
- Developing new products
- Discovering/sharing new resources
- Understanding how people from different countries work together



Pioneer/Jupiter-Saturn Spacecraft

Everyone benefits from:

_____

_____

because: _____

_____

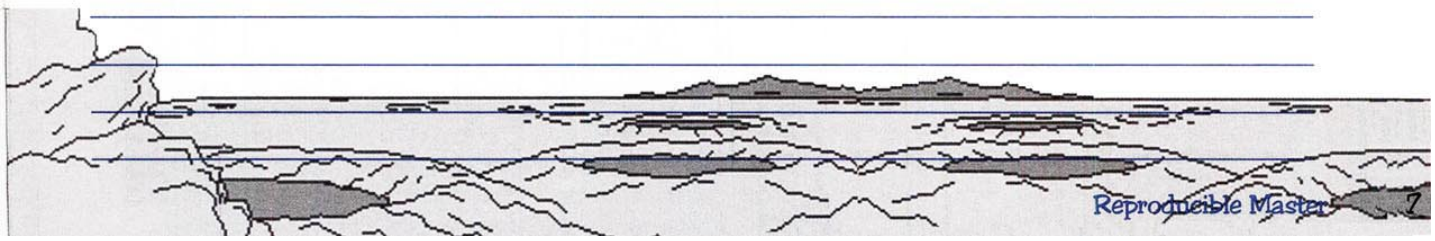
II. Space technology isn't just for astronauts. People here on Earth have benefited from technology that is used to help astronauts live in space. For each space-age item listed below, tell how the item is used in space, why it is useful there (because of the lack of gravity, for instance) and one way that it is used here on Earth.

	Used in Space to:	Used on Earth to:
1. Dehydrated food		
2. Velcro™		
3. Solar panels		
4. Microphones		
5. Drinking straw		
6. Fiberglass		
7. Teflon		

III. What if our space adventure had been a cooperative effort right from the start? On the lines below, describe at least three ways space exploration might be different today if everyone had worked together from the beginning.

_____

_____



Activity Three

A Day in Space

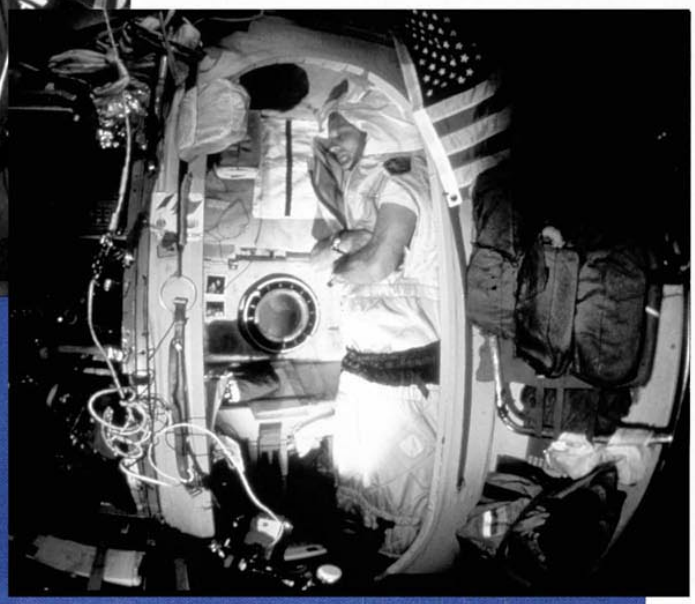
Objectives: To help students understand some of the human physical needs and issues related to life on board the Mir space station.

I. Introduce the activity by discussing what the film reveals about day-to-day life on board a space station. Ask: What activities are similar to things you do here on earth? Which ones are different? What does the film suggest about the importance of exercise, how the astronauts and cosmonauts spend their limited free time, the need to conserve water, the effects of weightlessness, and dealing with feelings of loneliness? Then, write these three headings across the top of the blackboard: Science, Station and Crew, and Personal. Ask students to brainstorm activities they might undertake on Mir and tell which heading each would come under. For instance, "do routine maintenance tasks" would come under the heading Station and Crew. Under Personal might fall "listen to music." Then, ask students to complete Part I of the activity sheet, filling in their own daily schedule of what they would do as a Youth Representative aboard the Mir space station. On the back of the activity sheet, have students list the items they would need to bring on board Mir in order to undertake the activities.

II. Explain that all water used on Mir is brought aboard the space station. Indicate that water is needed for more activities than just drinking. To illustrate how much water is needed for drinking alone, have students complete Part II of the activity. You might want to follow up by having students track and estimate the amount of water used for all their daily activities.

Related Activity: Share the dimensions of the main section of Mir with students: 17 meters (56 feet) long and 4 meters (13 feet) wide. Make a chalk drawing on the asphalt outside the school building. Or, tape together strips of wide packaging paper to represent an area the size of the main section of Mir and place it in the school gym. Have students walk and sit within this area. Ask: Is it a large area? What if you had to stay here continuously for weeks? Would it seem large then?

Astronaut Shannon Lucid checks a hydroponics experiment aboard Mir.



Astronaut Norm Thagard in sleep compartment aboard Mir.

I. Congratulations! You've been asked to serve as the Youth Representative aboard a space station for five days. What will you do there? In addition to survival basics (eating, sleeping, exercising), you might conduct an experiment, observe the stars, or make a new friend. Plan your own week in space using the chart below and what you learned from watching *Mission to Mir*.

	Monday	Tuesday	Wednesday	Thursday	Friday
6am					
7am					
8am					
9am					
10am					
11am					
12pm					
1pm					
2pm					
3pm					
4pm					
5pm					
6pm					
7pm					
8pm					
9pm					

What would you need to bring to do the activities listed above? Write your answers on the back of this sheet.

II. As astronaut Shannon Lucid points out in *Mission to Mir*, water is precious on a space station. To see how much water you use for drinking in a single day, try this experiment. Fill a plastic bottle with water. Carry it with you all day. Only drink water from the bottle. Or, if you drink another liquid, pour out an equal amount of water from the bottle. Fill the bottle as often as you like and keep track of how many times you fill it using the chart below.

Write the amount of water the bottle holds here:	Write the number of times you filled the bottle here:	Write how much water you used for drinking in one day here:	Write how much drinking water you would need during your 5-day stay aboard the space station:

Activity Four

A Look to the Future

Objectives: To help students develop written and oral communication skills as they imagine what the future might hold for space exploration as we work toward building an international space station.

I. Point out that plans for an international space station, currently called Alpha, are underway. Beyond that, the goal is to explore other planets. Ask students to hypothesize what technological advances future space stations might feature. Astronauts on longer space missions would probably need a way to grow and store their own food, produce their own water and generate more energy for power.) Explain that right now, solar panels provide some of the energy aboard Mir. Then have students conduct the following experiment to get a better idea of how solar energy works.

Astronaut Norm Thagard (r), on board Space Shuttle Atlantis (STS71), welcomes Cosmonaut Vladimir Dezhurov from Mir.

Preparation: You will need four thermometers, four same-size boxes (about the size of a shoe box), black paper, white paper, aluminum foil, see-through plastic wrap, glue, tape and scissors. Divide students into four groups. Have each group prepare one box for the experient by following these steps:

1. Cut away the top of the box and cover the inside with a covering—black paper, white paper, aluminum foil or clear plastic. Glue the covering in place.

2. Place a thermometer in the box with the numbers facing up so it can be read by looking inside the box.

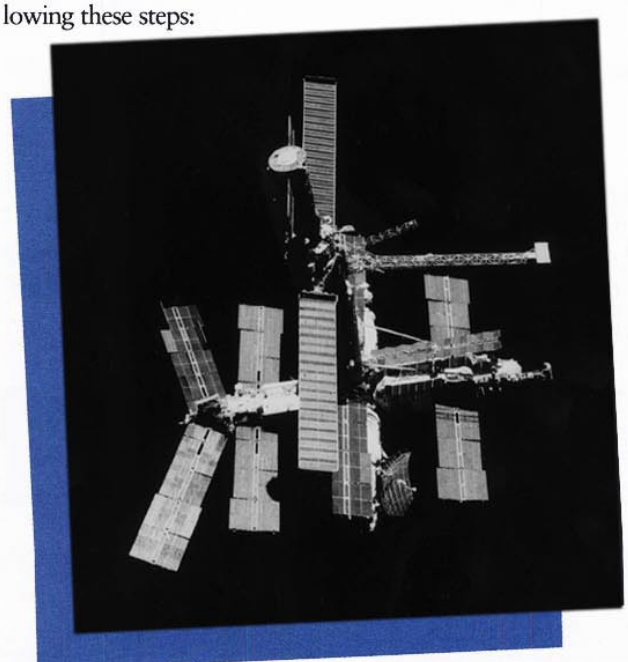
3. Cover the top opening of the box with a single sheet of plastic wrap, securing it in place with tape.

Have students place their boxes in a sunny area for 24 hours. At the end of that time, have each group report on the temperature of their box. Have students record the different temperatures on their activity sheets under Part I and indicate the box that worked best for heating. Discuss: Which box worked best and why?

II. Ask students to imagine how space exploration might be different 100 years from now. Discuss: Will people be exploring other planets? Other solar systems? What might they discover there? To complete Part II of the activity sheet, have students imagine that they are living in the future and looking back in history. Have them choose one aspect of space technology and tell how it 'developed.'

III. What does the future hold? Have students compile a list of momentous changes that have taken place in the world in the past decade. Then, invite students to write about what technological or other advances they would like to see accomplished in their lifetime and why on Part III of the activity sheet. Allow time for sharing of answers.

Related Activity: Have students gain additional experience in using and understanding solar energy by making and using a simple solar cooker. Write to the nonprofit organization Solar Cookers International, 1919 21st Street, Sacramento, California 95814 for information on how to receive a set of plans for building a working solar cooker from a cardboard box and other easy-to-find materials. Using only sunlight, students will be fascinated to find that they can actually cook a meal using 'throw-away' objects.



The sun reflects off the solar arrays of space station Mir, as seen from space shuttle Atlantis.

I. What's next after Mir? Plans are in the works for an international space station named Alpha. What will it need? It will need more room and more energy, among other things. Right now, solar panels provide some of the energy on Mir. To get an idea of how solar energy works, try a solar experiment. Your teacher will tell you what materials you need. Do the experiment. Then fill in the temperature for each box below.

Black Paper	White Paper	Aluminum Foil	Clear Plastic

The box that worked best for heating was:_____

II. It's time for history class. Only, the time is 100 years from now! Imagine you are a student living at the end of the twenty-first century. You are looking back on early space exploration. Choose one aspect of space technology below. On the lines, describe how it 'developed' in the early days of the space program and how it has changed during the twenty-first century.

• Spacesuits • Rocket boosters • Space station module • Space probes • Communication • Space food

_____

_____

_____

_____

_____

_____

III. What technological or other advance would you like to see happen in your lifetime? On the lines below, explain why you would like this to become a reality.

_____

_____

_____

_____

_____

Additional Resources

For Ages 8-10

1,000 Facts About Space, by Pam Beasant. London: Kingfisher Books, 1992.

The Children's Space Atlas: A Voyage of Discovery for Young Astronauts, by Robin Kerrod. Brookfield, Connecticut: Millbrook Press, 1992.

Could You Ever Fly to the Stars?, by David Darling. New York: Dillon Press, 1990.

Just a Look at Living in Space, by Robin Kerrod. Vero Beach, Florida: Rourke Publishing Group, 1984.

Living in Space, by Don Berliner. Minneapolis: Lerner Publications, 1993.

Living In Space, by Larry Kettlekamp. Fairfield, New Jersey: William Morrow and Company, 1993.

Look to the Sky, by Jerry Debruin. Columbus, Ohio: Good Apple Books, 1988.

One Giant Leap for Mankind, by Carter Smith. Columbus, Ohio: Silver Burdett, 1989.

See Inside a Space Station, by Robin Kerrod and R. J. Unstead. New York: Franklin Watts, 1988.

Space Station, by Necia H. Apfel. New York: Franklin Watts, 1987.

The Twenty-first Century in Space, by Isaac Asimov, Robert Giraud and Greg Walz-Chojnacki. Milwaukee, Wisconsin: Gareth Stevens, 1996.

For Ages 11-14

2001, A Space Odyssey, by Arthur C. Clarke. Bergenfield, New Jersey, 1993.

Amazing Space Facts, by Susan Goodman. New York: Peter Bedrick Books, 1993.

NASA—Visions of Space: Capturing the History of NASA, by Robin Kerrod. Philadelphia, Pennsylvania: Courage Books, 1990.

Space Exploration Projects for Young Scientists, by Gregory Vogt. New York: Franklin Watts, 1995.

Space History, by Tony Osman. New York: St. Martins Press, 1988.

Space Science Projects for Young Scientists, by David E. McKay, and Bruce G. Smith. New York: Franklin Watts, 1986.

Space station Mir as it crosses the Earth's limb.

Space Station: Living and Working in Space, by Amanda Davis. New York: Rosen Publishing Group, 1997.

Think About Space, by Isaac Asimov and Frank White. New York: Walker and Company, 1989.

Women Astronauts: Aboard the Space Shuttle, by Mary Virginia Fox. Englewood Cliffs, New Jersey: Messner, 1987.

Web Sites

http://www.mission2mir.com
Find out more about the film *Mission to Mir*.

http://www.imax.com
This web site offers a worldwide map of IMAX theatres and show times.

http://shuttle-mir.nasa.gov
Students will enjoy visiting the Shuttle/Mir Information Center, providing up-to-date information about current missions.

http://osf.hq.nasa.gov/mir/welcome.html
See what's new at the Space Station Mir web site.

http://www.sti.nasa.gov
Use this web site to access background information for adults about ongoing space missions.

http://quest.arc.nasa.gov/women/WON.html
This web site lets you find out more about the women of NASA, including astronaut Shannon Lucid.

http://fits.cv.nrao.edu
The AstroWeb Consortium has lots of information for anyone interested in space exploration.

http://issa-www.jsc.nasa.gov
Take a peek at what the Alpha space station will look like.

http://ksc.nasa.gov
Find out more about the Kennedy Space Center at this web site.

http://learn.jpl.nasa.gov
Teachers will appreciate this site for its space science lessons.

http://shuttle.nasa.gov/index.html
Learn about space shuttle Columbia's next mission and try 'flying' through the payload bay.

http://spacelink.msfc.nasa.gov
Check out this collection of educational NASA materials and sites.

http://sln.fi.edu/tfi/hotlists/space.html
Check out the Space Science Hotlist for exciting new topics.

http://www.npac.syr.edu/textbook/kidsweb.astronomy.html
This web site lets students learn about space topics like the history of space exploration and how to become an astronaut.

http://Lockheed.com
Find out more about Lockheed Martin Corporation.

http://spaceday.com
This web site offers ideas for a celebration of space. Students can even experience what it might be like to steer Mir.

http://nasm.edu
Visit the National Air and Space Museum via this web.

http://www.nauts.com
See this web site for a timeline of space events and space trivia game.

Acknowledgments

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Roberta Nusim, president; Jane Fieberts, editor;
Willow Ann Sirch, writer; Leslie B. Cullinan,
art director.

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Director (Russia) Ivan Galin
Director of Photography James Neihouse
Music by Micky Erbe and Maribeth Solomon
Executive Producers Andrew Gellis and Jonathan Barker
Producers Toni Myers and Graeme Ferguson

Space image photographs ©NASA. Yuri Gagarin photograph courtesy of The Smithsonian Institution.
John Glenn photograph courtesy of NASA.