



Peril on the Red Planet Study Guide

Open Dream Ensemble is a project of the Thomas S. Kenan Institute for the Arts, whose mission is to incubate projects that sustain artists at every point in their creative development through strategic partnerships that capitalize on visionary thinking in the arts.

Dear Educator,

The following study guide provides suggestions for classroom activities and lessons that tie into our original production, *The Red Planet*. It includes a character list, questions for pre- and post-*Red Planet* viewing, curriculum-based information and activities that are centered on *Red Planet* characters and adventures, and a bibliography.

If you are interested in pursuing further Mars-based learning and activities, our cooperating organization, Imagine Mars (<http://imaginemars.jpl.nasa.gov>) is an excellent resource.

Open Dream Ensemble Contact: info@opendreamensemble.com, 336-782-7837

A Word from the Director/ Writer Mollve Maxner

Peril on the Red Planet is a hero's journey. The central character, Diana, has to undergo a series of challenges that test her courage, problem solving, diligence, creativity, responsibility and capacity for sacrifice.

The staging is constantly moving as the characters seamlessly shift from one location to the next, using cloth and object-motion to evoke a sense of traveling. As the versatile set pieces transform from one shape to another, the characters make their way across the Martian landscape and finally climb the massive volcano, Olympus Mons.

In creating the set and costumes we researched how objects and landscapes on Mars differ from those on Earth. We found exciting ways to reference these differences, allowing the imagination of the audience to expound upon our discoveries. We utilized the same principle in terms of the science in the story: we weave actual scientific discoveries with the possibility of what technology might become in the future. The audience's imagination is heightened even further through the use of sound, light and shadow as we create the futuristic and dangerous machine, ZARTOK.

The central theme of *Peril* is the power to move into the future bravely and responsibly. Using sets, costumes, music and movement, we aim to spark the curiosity of the audience as they experience the journey with us and imagine what life may be when we make Mars our home.

Glad to have you along!
Mollve

Character List

DIANA. A thirteen-year-old girl born on Mars. DIANA is smart, confident and daring. She believes she knows what's best for Mars and takes a risk to put that belief into action.

ABEONA. A robot created by Diana's mother to protect Diana throughout her childhood. Abeona is Diana's best friend. The name Abeona comes from one of the minor gods of the Roman Pantheon, meaning "the protector of children leaving home".

TRISTAN. Diana's father and a brilliant agricultural scientist. He headed the scientific team that created the first ZARTOK.

DEMETER. The metallurgic scientist that built the first ZARTOK's body. Demeter is serious, determined and thoughtful. She has a robot that she has programmed to be her companion.

DR. EMBER. A robotics engineer that made the motions of the first ZARTOK possible. Dr. Ember uses video games to escape from his fears and responsibility.

THE MARTIAN COPS. The police force of Mars. These two characters are all bravado and no action.

ZARTOK. The machine created initially by Tristan, Demeter, Dr. Ember and Sophia (Diana's mother). The machine is robot-like and makes the Martian soil fit for agricultural development—a huge step in making Mars habitable for humans. The machine went horribly wrong, causing chaos and death until its makers destroyed it when Diana was still a young girl.

Questions and Discussion Points

Pre-Performance Questions

1. What is a play?
2. What is needed to create a play?
3. When have you seen dancing, acting and music together?
4. What is the difference between a movie and a play?

Post-Performance Questions

1. Who were the characters in the play?
2. How did the cast use movement, dance, sound, and props to tell the story?
3. How are acting, dancing, and music different when they are performed together than when they are performed alone?
4. How did the performers express how the characters felt (use of music, dance, gestures, facial expressions, language)?

Discussion points

1. Discuss communities. What makes communities? What are some of the necessary roles that have to be filled in every community? How will communities be different in the future? What changes would happen to communities if they were to develop on Mars in the future?
2. Through the course of *Peril on the Red Planet*, Diana learned a number of lessons. At the beginning of the play she was reluctant to accept advice or help. She would not accept full responsibility for recreating ZARTOK. She had to find the courage to do what was ethically correct. Discuss how Diana learned to accept help, recognize the need for teamwork, make sacrifices, and redefine her community.

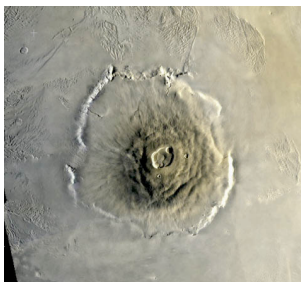
Things to look and listen for in the performance:

1. How the set shifts and moves to represent different locations and moods.
2. How do the costumes represent the characters?
3. Many instruments are used for different purposes and effects. Listen for which instruments are used when. Why would the composer make these choices for the soundscape? How does different music represent different characters?

Facts about Mars

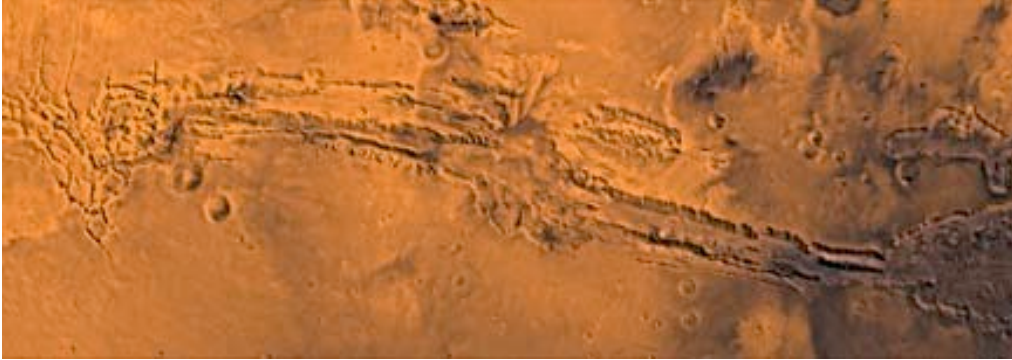
- Martian gravity is 1/3 the strength of Earth's. This means you could jump three times higher on Mars.
- The diameter of Mars is 4,220 miles. Earth's diameter is 7,926 miles.
- The average temperature of Mars is -81 degrees Fahrenheit.
- A Martian day, or sol, is 24 hours and 40 minutes. There are 669 sols in a Martian year.
- Mars has two irregularly shaped moons, Deimos (Panic) and Phobos (Fear). Deimos completes its orbit around Mars every 30.3 hours. Phobos orbits Mars three times in one sol.
- The distance to Mars varies from 35 million to 249 million miles because of the elliptical orbit it makes around the sun.
- A trip to Mars would take about 7 months and 100 million miles to complete.
- If you stood on the Martian equator, it would be about 70 degrees Fahrenheit at your feet and 32 degrees Fahrenheit at your head.
- Because the surface pressure on Mars is 1/100 of Earth's, your internal organs would push out of your body unless you wore a pressurized space suit.
- The atmosphere on Mars is very thin and 95.3% carbon dioxide.
- Although Mars is much smaller than Earth, its surface area is about the same as the land surface area of Earth because it does not have bodies of water on its' surface.

Locations on Mars that appear in *Peril on the Red Planet*



Olympus Mons is the largest known volcano in the solar system. It is 374 miles in diameter and 16 miles high. Olympus Mons is so large it covers an area the size of the entire state of Arizona.

Valles Marineris is a system of canyons 4000 km long and from 2 to 11 km deep. if on earth it would reach from Washington DC to California.



Cydonia Mensae is the “face on Mars” first photographed in 1976 by the Viking Orbiter I. It is located in Mars’s northern hemisphere in an area that lies between smooth and heavily cratered zones. The “face” is comprised of mesa-like topographical landforms.



Science, Social Studies

Research the differences between Earth and Mars with particular regard to how human life can be sustained in a Martian environment.

Answer the following questions:

- What is necessary for human survival?
- What resources are found on Mars? What kinds of inventions are required to make them useable?
- What would have to be transported to Mars?
- Are there some things that could initially be transported that could later be produced on Mars?
- What personal and professional characteristics would people in early Martian communities need?
- What form of government would work best on Mars? Why?
- What economic activities would have to occur on Mars? Would they impact Earth? How?
- How would religion, ethics, and values be impacted if Earth were to create a community on Mars?
- How would Earthling inhabitants of Mars deal with:
 - o Climate
 - o Food, water, and air
 - o Transportation and shelter
 - o Medical needs
 - o Research
 - o Sound / sound waves
 - o Energy
 - o Waste Disposal

English Language Arts, Theater, Music

Divide into groups of 3 – 5. Write a 5-minute script of a dinner conversation on Mars. It should include some details of daily living, some scientific facts, and reference to what is eaten for dinner and from where it came. Rehearse and stage the conversation.

Divide into groups of 2 – 3. Each group will create a 3-minute commercial for a product necessary on Mars. Include created music / soundtracks. Perform the commercials.

The great debate! Create teams to research and debate on the:

- Reasons for having or not having a community on Mars.
- Selection criteria for the members of the community
- Will Earth have a community on Mars by 2100 or not? What would permit a community to happen or not?

Haiku

Demeter speaks in Haiku. Haiku are a form of Japanese poetry consisting of three phrases. The first phrase has five syllables, the second has seven and the third has five. Haiku tend to have nature as the topic.

What elements in nature or science are you currently learning about? Write a fact-based haiku and read it for the class.

The Hero's Journey

Diana must go on a hero's journey in order to save Mars. What are some of the lessons she learns along the way? What are some things she has to come to understand about herself? Write an essay about a hero and the journey they had to take in order to accomplish something meaningful.

Bibliography

<http://imagine-mars.jpl.nasa.gov/index2.html>

<http://marsprohttp://marsprogram.jpl.nasa.gov/science/life/>

<http://www.nasa.gov/>

http://www.nasa.gov/worldbook/mars_worldbook.html

<http://marsrover.nasa.gov/home/>

<http://www.solarviews.com/eng/mars.htm>

<http://phoenix.lpl.arizona.edu/>

http://www.nineplanets.org/mars.html#gram.jpl.nasa.gov/funzone_flash.html

Bell, Jim. *Postcards from Mars: The First Photographer on the Red Planet*. New York: Dutton, 2006.

Bell, Jim. *Mars 3-D: A Rover's-Eye View of the Red Planet*. New York: Sterling Publishers, 2008.

Forget, François, Costard, François, and Lognonné, Philippe. *Planet Mars: Story of Another World*. Germany: Springer Praxis Books, 2008.

Getz, David and McCarty, Peter (illustrator). *Life on Mars*. New York: Henry Holt and Company, LLC, 1997.

Hartmann, William K. *A Traveler's Guide to Mars*. New York: Workman Publishing, 2003.

Murray, Stuart. *Mars (DK Eyewitness Books)*. New York: DK Publishing, Inc, 2004.

Squyres, Steve. *Roving Mars: Spirit, Opportunity, and the Exploration of the Red Planet*. New York: Hyperion, 2005.

Zubrin, Robert. *How to live on Mars: a trusty guidebook to surviving and thriving on the Red Planet*. New York: Three Rivers Press, 2008.