

# Discover Magazine: The Solar System

**Grade Level:** 9-12

**Subject:** Astronomy/Space

**Duration:** One or two class periods

## Objectives

Students will

- learn about NASA's options for its space program;
- research which option may be the most viable; and
- make a recommendation based on research.

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## Materials

- Paper and pencils
- Newsprint and markers
- Computer with Internet access
- *Discover Magazine: The Solar System* video and VCR

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## Procedures

1. Begin the lesson with a discussion about the space program, which is run by the National Aeronautics and Space Administration, also known as NASA. Ask students if they are familiar with any space missions. Ask if they are aware of any discoveries that have been made through the space program. Write the students' ideas on the board or a large sheet of newsprint. Students may suggest the following:

- The mission to walk on the moon
- The study of lunar (moon rock) samples
- The Hubble Space Telescope, which sends back high-resolution images of celestial bodies
- The International Space Station, where astronauts live to conduct experiments

Discuss the stages that the space program has undergone. Point out that since the space shuttle disasters, the space program has lost its momentum. Officials at NASA are working to set new priorities for the agency.

2. To learn more about space programs under consideration, show students the segment entitled "Up Close and Far Away." Focus on the researchers discussing traveling to Mars and further travel to the moon.
3. Tell students that the video is a starting point for forming their own ideas about what NASA should plan for the space program. Students will research NASA's ideas for space exploration and then develop their own opinions about options.
4. Divide students into groups of three or four. Have each group research the topic and choose the best option for NASA to pursue. Each group will present its ideas, which must be supported by evidence, including pictures.
5. Give students time in class to research the topic. The following Web sites have useful information:

<http://www.startribune.com/stories/1519/4872513.html>  
<http://slate.msn.com/id/2078157/>  
<http://www.martiansoil.com/archives/001073.php>  
<http://www.npr.org/features/feature.php?wfId=1407363>

[http://www.space.com/news/commentary\\_top10\\_030912.html](http://www.space.com/news/commentary_top10_030912.html)  
[http://www.nasa.gov/pdf/60736main\\_M2M\\_report\\_small.pdf](http://www.nasa.gov/pdf/60736main_M2M_report_small.pdf)  
[http://www.nasa.gov/vision/space/features/jfk\\_speech.html](http://www.nasa.gov/vision/space/features/jfk_speech.html)  
<http://spaceflight.nasa.gov>

6. After the groups have completed their research, have them prepare a statement identifying their lists of priorities for NASA.
7. Have each group present its ideas. Ask one student to take notes, recording each group's ideas.
8. Conclude the lesson by discussing the groups' ideas to arrive at a class consensus of a recommendation for NASA. Does the class suggest travel to the moon or Mars? Do students argue for the use of robot or human for exploration? Summarize the class's ideas on a sheet of newsprint and post it in the room for visitors to see.

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## Evaluation

Use the following three-point rubric to evaluate students' work during this lesson.

- **Three points:** Students participated actively in class discussions; worked effectively with their group in researching recommendations for NASA; prepared an informative report; and made a compelling presentation.
- **Two points:** Students participated in class discussions; worked somewhat effectively with their group in researching recommendations for NASA; prepared a competent report; and made an informative presentation.
- **One point:** Students did not participate in class discussions; had difficulty working with their group in researching recommendations for NASA; prepared a disorganized or incomplete report; and did not make a good presentation.

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## Vocabulary

### Mars

**Definition:** one of the four inner planets, or those closest to the sun; like all the inner planets, Mars has a rocky surface.

**Context:** NASA has identified exploring Mars as one of the future goals of the space program.

### moon

**Definition:** Earth's only natural satellite and closet neighbor in space

**Context:** Returning to the moon is under consideration as the next step for the space program.

### NASA

**Definition:** acronym for the National Aeronautics and Space Administration, a federal agency charged with managing the space program

**Context:** After many setbacks, NASA is working to determine the next steps of the space program.

### space shuttle

**Definition:** a program started by NASA in 1981 in which reusable spacecraft are sent into space, transporting astronauts and equipment

**Context:** NASA is working on the space shuttle *Discovery*, the first shuttle scheduled since the *Columbia* crashed on reentry to Earth on February 1, 2003.

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## Academic Standards

The National Academy of Sciences provides guidelines for teaching science and a coherent vision of what it means to be scientifically literate for students in grades K–12. To view the standards, visit this Web site:

<http://books.nap.edu/html/nse/html/overview.html#content>.

This lesson plan addresses the following national standards:

- Science as Inquiry: Understandings about scientific inquiry
- Science and Technology: Understandings about science and technology

- Science in Personal and Social Perspectives: Natural and human-induced hazards; Science and technology in local, national, and global challenges
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## **Credit**

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