Unlocking the Mysteries: Science on the Edge of Our Solar System

Educational Product	
Educators	Grades 5-8

Teacher Guide

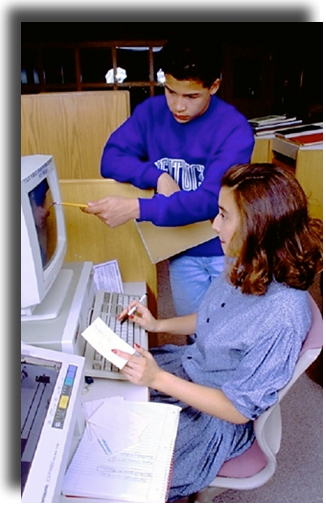
Content Background

The National Aeronautics and Space Administration (NASA) Discovery Program is a series of unmanned, robotic space missions that use the latest technology innovations to design exciting, lower-cost space science investigations. The Discovery mission teams of scientists, engineers, and support staff reach into the unknown and do what's never been done before, advancing knowledge that may also improve life on Earth. The current Discovery missions can be grouped into three categories: 1) probe comets and asteroids and return to Earth new information or samples of materials; 2) collect data and/or samples from the Sun, the Moon, and the planets; and 3) search for extra-solar planets that form solar systems around distant stars. All of these investigations will improve our understanding of the nature of our solar system, especially those objects closer to Earth.

NASA

The Discovery Program video, *Unlocking Mysteries of the Solar System*, serves as the springboard for this classroom investigation and highlights the exciting work of the people who develop, test, and launch this series of robotic spacecraft. Ten mission segments depict each mission's purpose, timeline, and unique aspects in the form of mission footage and visually engaging simulations.

Students can learn more about the Discovery Program on its Web site at < http://discovery.nasa.gov >. The site provides an overview of each mission, suggestions for educational activities, and additional resources. Each mission segment closes with the Internet address for that mission. Discovery mission Web sites provide access to extensive information about each mission, related educational activities, a description of the people involved, and detailed information about the science and technology of the mission.



What Students Do in this Activity

Students respond to a request from NASA to design a future robotic space science mission. They review the purpose and goals of the present round of missions that comprise the Discovery Program. Through in-depth research and experimentation, students become class experts about a single mission and present their findings to the class. Using their combined expertise, the class identifies the potential outcomes for the Discovery Program. Based upon their research, experimentation, and review of the Discovery Program, students develop detailed proposals for the next generation of robotic space missions.

Learning Goals

Students will:

- Identify and communicate to others the varied space science explorations carried out by the Discovery Program.
- Use research skills to gain expertise about an individual NASA mission.
- Use oral and visual communication techniques to present findings to peers.
- Identify and communicate the needs of future scientific investigations.
- Use process-writing skills to respond to a NASA Discovery Program Announcement of Opportunity (AO) to submit a proposal.
- Identify and express the importance of science as related to the needs of society.

National Standards Addressed
Grades 5-8
Science as Inquiry
Understandings about scientific inquiry
- Different kinds of questions suggest different kinds of investigations
- Current scientific knowledge and understanding guides scientific investigations
- Technology used to gather data enhances accuracy and allows scientists to analyze and quantify results of investigations
- Scientific investigations sometimes result in new ideas for study

Earth and Space Science
- Earth and the solar system

Science and Technology
Understandings about science and technology
- Scientific inquiry and technological design have similarities and differences
- Many different people and different cultures have made and continue to make contributions to science and technology
- Perfectly designed solutions do not exist
- Science and technology are reciprocal

Science in Personal and Social Perspectives
Science and technology in society
- Technology influences society through its products and processes
- Scientists and engineers work in many different settings

History and Nature of Science
- Science as a human endeavor
- Women and men of different backgrounds engage in activities of science
- Science requires different abilities

Nature of Science
- Scientists test their explanations of nature using observations, experiments and models
- It is part of scientific inquiry to evaluate the results of scientific investigations proposed by other scientists

View a full text of the National Science Education Standards.

Preparation and Materials
Estimated Preparation Time: 15 minutes per session
Estimated Class Time:
- Approximately 5 hours to complete full unit.
- Approximately 3-1/2 hours to complete the unit without the hands-on activity.

Materials
For the Teacher
- Video: *Unlocking Mysteries of the Solar System*
- TV and DVD player or computer with DVD player
- Chalkboard
- Poster paper
- Overhead transparencies of:
  - AO letter
  - Each student activity page (optional)

Internet access required.

For the Class
- Internet access
- Access to science laboratory and materials (optional)

For the Students
- Pencils
- AO letter

- Student Recording Sheets:
  - — Student Video Guide (optional)
  - — Graphic Organizer (optional)
  - — Mission Expert Research
- Mission Timeline
- Student Activity Sheet, "Presenting the Research and Experiment Results"
- Internet Resources

Unit at a Glance

Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7
Introducing the Discovery Program: Reading the AO Watching the Video	Assigning Mission Experts Beginning Mission Research	Continue Research of Missions Plan for Activities	Performing Activities	Presenting Results of Research & Activities	Reviewing and Responding to the Discovery AO	Sharing New Mission Concepts: Responding to the AO

Advanced Preparation

- Read and review lesson plans and content background
- Review the video: *Unlocking Mysteries of the Solar System*
- Arrange for Internet access
- Copy student pages (one per each individual)
- Review recommended activities (optional)
- Identify laboratory needs and access to materials and equipment
- Arrange classroom for discussion and viewing a video, Session 1
- Arrange classroom for research and experimentation, Sessions 2-4
- Arrange classroom for presentation and discussion, Sessions 5-7

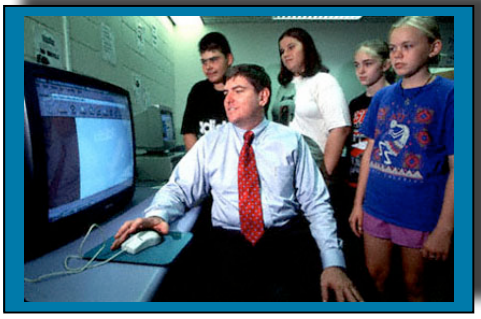
Teacher Tip
Throughout this unit, use a graphic organizer or other method to help students organize what they know, want to know, and have learned (K-W-L).

Teacher Tip
Use an active reading strategy, such as reading in pairs or small groups, to increase student involvement. For a selection of strategies, see the publications listed in the resource section of this document.

Classroom Activities

Session 1: Setting the Scene

Explain to students that they will study space science and the latest missions of NASA's Discovery Program. Ask them to share what they already know about NASA and the U.S. and international efforts to explore space through missions and Earth-based research. List the student responses on the board.



Session 1: Introducing the Discovery Program: Reading and Reviewing the AO

Explain to students that you have received a request from NASA for your class to participate in the development of future robotic space missions. Tell them that the form of the request is in a letter and that the professional term is called an "AO" or Announcement of Opportunity. Distribute a copy of the letter to each student. Ask for volunteers to read all or part of the letter aloud.

Following the reading, ask students to briefly explain or summarize the letter. Some questions to facilitate review of the letter include:

- What is it that NASA wants?
- What is a proposal?
- Why would NASA request suggestions from external individuals or groups?
- What individuals or organizations would likely respond to an AO?
- What are some things you need to do to meet the challenge from NASA?
- What do you think you need to learn about space exploration before you present your ideas to NASA?
- How will learning about present NASA Discovery missions help you prepare a proposal for a future mission?

Teacher Tip
Occasionally pause the video and help students review the various missions and their individual goals. If you want to provide students with time to take notes about each mission, have them record the name of the mission, what it is studying, and a description in their own words. Use the optional Student Video Guide to assist student note taking.

Session 1: Viewing *Unlocking Mysteries of the Solar System*
Explain to students that along with the AO, you also received a video that briefly explains about the missions that make up the Discovery Program. Also explain to students that they will form small groups and become the experts about one of the missions described in the video. As they watch the video, ask them to pay close attention to the goals of each mission as well as the goals of the program as a whole.

Session 2: Assigning and Beginning Mission Research
If necessary, begin class by reviewing the Discovery Program goals < http://discovery.nasa.gov > and what is expected of students. Review the video and AO as needed. If students took notes while watching the video, have them look them over briefly. Assign teams and topics. Use a method that you are comfortable with, such as assigning previously arranged teams, having students pick partners, or a random method.

Teacher Tip
Teams: Groups of two or three allow each student the opportunity to take responsibility for the work of becoming a mission expert. Based on your knowledge of the class, you may randomly assign students to groups or prepare the groups in advance.

Topics: It is critical that each mission is researched. You may want to let each team submit their top three mission choices, and then use a lottery system to assign one of these choices to each group.

Distribute and review the student activity sheet: Mission Expert Research. Make certain that students understand that as the "mission experts" it will be their responsibility to identify:

- The purpose of the mission.
- The uniqueness of the mission including the scientific information gained and any special technology used to perform the work.
- How the individual mission contributes to the overall knowledge gained by the Discovery Program.
- The individuals or groups of scientists, engineers, and other personnel that contribute to the development and success of the mission.
- Any special or unexpected results of the mission.

Teacher Tip
Specific Internet addresses have been provided for the research and experiment portion of this unit. If students are not familiar with gathering information from the Internet, you may want to demonstrate how to access an Internet browser and open a specific web site.

Explain any policies or expectations you have with respect to use of the Internet. Arrange the computer room seating so teams of students are near each other. Introduce students to the Discovery Program home page < http://discovery.nasa.gov > and bar at the top that links to the missions. Post the mission Web site addresses where students can see them. These addresses are found on the Internet Resources document. Circulate around the room as teams research the mission for which they are responsible. Assist students in finding and recording the information requested on the Mission Expert Research page.

NEXT STEP
The next two sessions include planning for and carrying out hands-on activities with your students. We encourage students to complete activities or build models to familiarize themselves with the missions and science associated with the Discovery Program. Many of the Discovery Program missions have Web sites that recommend experiments and activities for students to perform. The list of Internet addresses and recommended activities can be found on the Internet Resources document. If you lack laboratory space or time, it is possible to respond to the NASA AO without doing the hands-on portion of this unit.

Depending on student ability and classroom resources, there are several ways to organize the class for the next phase of this unit. See suggestions listed below.

- Student teams perform one or more activities that relate to their selected mission.
- Identify one experiment or activity and arrange the classroom and supplies so that every student in the class performs the identical experiment.
- Use several of the experiments or activities to create a station-based laboratory class.

Teacher Tip
Review the requirements for the recommended experiments and activities. Attempt one or more yourself to identify challenges, prior to working with students in the laboratory or classroom setting.

Session 4: Performing Activities
Depending on your approach, student teams may perform a unique activity or one that other students have also performed.

As students work, check that they:

- Understand the purpose of the activity.
- Explain what they have learned as a result of performing the experiment or activity and how this will help them to respond to the NASA AO.

Teacher Tip
The Council of State Science Supervisors (CSSS) has safety information and a publication (PDF), *Science and Safety, Making the Connection*, at:
< http://www.csss-science.org/safety.shtml >

If students perform unique activities, explain that they will report their results at the same time they share all of the information regarding their selected mission. If students perform identical activities, consider reviewing the results of the experiment separate from the mission reporting activities.

Session 5: Presenting Results of Research and Activities
In this session, students serve in the role as mission experts and present their work. Allow them time to review their notes and plan for the presentation. Clearly post the important topics and questions that you expect students to address during their presentations.

The following list recommends some (but not all) of the possible issues students should cover in their presentation:

- The name of mission.
- The dates of mission.
- The purpose of the mission.
- The uniqueness of the mission, including the scientific information gained and any special technology used to perform the work.
- How the individual mission contributes to the overall knowledge gained by the Discovery Program.
- The individuals or groups of scientists, engineers, and other personnel that contributed to the development and success of the mission.
- Any special or unexpected results of the mission.
- A brief description of the experiment students performed and results. (optional)

Teacher Tip
Student presentations should provide the class with more details about each mission and a better understanding of the Discovery Program. If you choose not to have student oral presentations, then consider the following methods:

- poster sessions
- student-produced video (rather than live)
- discussion of the Discovery Program with teams leading a review of their mission

Younger students may prefer to write a song or poem about the mission.

Guidelines for Oral Presentations

Remind students that oral presentations provide an opportunity for them to practice important communication skills. Strong presentations and presenters:

- Are organized and have an obvious beginning, middle, and end.
- Engage the audience.
- Use visual aids.
- Include occasional and appropriate humor.
- Make eye contact with the audience.
- Appear relaxed.
- Speak clearly and explain technical terms.
- Dress appropriately for the setting.

Teacher Tip

Depending on available time and your expectations, the presentations may be formal or informal. For more formal events, enlist the support of other teachers, such as the language arts and special education teachers, to help students write and practice their presentations.

Remind the class that as an audience they need to listen carefully and be prepared to ask questions of the presenters.

When discussing the CONTOUR mission, remind the students that failure provides a learning opportunity and talk about how to turn a negative situation into a positive one.

Once all the presentations have been completed, ask students to provide a written summary and to reflect on the overall outcomes of the Discovery Program. Use a graphic organizer, such as a web, to list each of the major areas of studies (comets and asteroids, near Earth objects, and planets around distant stars).

Reintroduce the AO letter and remind students that NASA encourages that next-generation proposals expand upon and advance the work done by the original Discovery Program missions.

Teacher Tip

To support writing projects, develop or use a familiar graphic organizer. If students have saved their notes from the video, their research, their presentations, and their review of the Discovery Program web, use these to support the writing process. Remember to enlist the support of the language arts and special education teachers on your team should you need additional time with the writing aspect of this lesson.

Session 6: Reviewing and Responding to the Discovery AO

Explain to students that it is their turn to design a NASA mission. Ask them what they think NASA should concentrate on learning more about in the future and how the next generation of robotic missions can help scientists reach their goals. If necessary, refer students to their summary statements that they developed at the end of the presentations. Help the class brainstorm as many ideas as possible for areas of future scientific investigation of space. Remind students that during a brainstorming session all ideas are welcome. Record and save their ideas.

Some questions to assist students to brainstorm new mission concepts might include the following:

- What planets need to be explored or explored more completely?
- What new technology should be tested in space for exploration purposes?
- What questions do the present Discovery missions leave unanswered?
- What interests you?
- What do you think would be useful information for the people of Earth to know about their solar system and beyond?
- What information can we gather from space that would improve life on Earth?

Once students have brainstormed the various mission topics, have them review the original AO. Place a transparency of the original letter from NASA on the overhead and have students reread silently. Ask students to list what they must include in their response to the AO. A complete list will include at least the following:

NASA EXPECTS THE PROPOSAL TO:

- State the name of the new mission.
- Provide a detailed description of the purpose or goal of the new mission.
- Predict the length of time of the new mission.
- List the type of materials or data to be collected by the new mission.
- Explain the value of the new mission to science and society.
- Explain how the mission will share new knowledge with scientists and the public.
- Give an explanation of how the new mission will extend and expand the Discovery Program.
- Describe special or unique aspects of the mission and any associated new instrumentation that will further our science inquiry.
- List the personnel requirements for the new mission.
- The proposal should not exceed two pages.

Once the class has developed a list of AO requirements, decide how students will respond to the NASA proposal. Some alternatives are listed below:

- Each student will write a different and individual response to the AO.
- Each mission team will write a response to the AO based upon their expertise gained through earlier research.
- The mission teams will be dispersed and new teams, consisting of experts from each mission, will write the response.
- The class will identify one mission concept and individuals will write responses.

Students will need time to do the following over the next day or two. Some of these activities might be done in class or as homework:

- Continue to brainstorm a mission goal or topic.
- Complete an outline of their mission that reflects the expectations of the AO.
- Draft a written response to the AO based upon the expectations listed in class.
- Edit and revise their draft response.
- Write or type a final response.

Teacher Tip

Provide specific instructions for what to include in their mission proposal packet, such as: mission name, destination, science goals, how long it would take to get there, whether new or special instruments or technology are required, cost (to see if they understand it must be under $425 million), how it fits into the Discovery Program (a small robotic mission), what will be especially interesting about this mission. Have them draw a picture to illustrate the mission.

Session 7: Sharing New Mission Concepts: Responding to the AO

There are several methods for sharing the AO responses created by students or student teams. A few suggestions include:

- Students or teams briefly speak about the mission they have proposed in front of the whole class, describing how they have met the requirements. Students can create a poster to present their proposal. Assign specific roles so everyone has a part. Include a rehearsal so everyone knows what they will present. The class can act as a review panel and ask questions of the presenters.
- Students or teams swap their completed AO packet with another team that reads and critiques the work using a rubric or checklist for recording comments.
- For classes in which each student creates a response, have students swap their work with one or more peers. For example, one peer that they choose and one chosen for them by the teacher.

Teacher Tip

During the peer review process, students should list strengths and weaknesses in the proposal based on the established criteria.

Engaging Extensions

The following are suggestions for additional fun things to do for varying levels of students:

- As students design their mission and consider names, they could also brainstorm an acronym, such as Comet Nucleus Tour, or CONTOUR.

- Create a patch design that illustrates the key elements of the mission
- All missions are required to spend about 1% of their funding for education and public outreach. Design an education and public outreach plan to teach students and the public about your mission. Elements can include web sites, curriculum based on the science of the mission, posters, animations, decals, museum exhibits, planetarium shows, and a documentary film.
- Make a model of your spacecraft that includes mockups of the instruments and the mission name.

Built-In Flexibility

This teacher guide has been written to provide flexibility for teachers with varying resources, knowledge, and students of various ages and abilities. Thus, depending upon the individual situation, there are opportunities throughout the unit to expand and emphasize each daily lesson. For example, classes with access to a laboratory and materials may choose to focus on the activities that relate to the unit. Teachers who want to stress communication skills, both written and oral, might emphasize the presentation and written response to the AO and collaborate with the language arts teacher on the team. Additionally, individual students might wish to use this unit as the basis of an independent project for a science fair or for extra credit. To make it more challenging, students can access the comprehensive "Basics of Spaceflight" web site, <http://www2.jpl.nasa.gov/basics/> which has sections on the space environment, flight projects, and flight operations, with quizzes to assess learning.

Resources

Harmin, M. (1994). *Inspiring active learning: A handbook for teachers*. Alexandria, VA. Association for Supervision and Curriculum Development.

Marzano, R., Pickering, D., Pollock, J. (2001). Summarizing and note taking. In *Classroom instruction that works* (pp. 29-48). Alexandria, VA: Association for Supervision and Curriculum Development.

Saphier, J., & Haley, M. A. (1993). *Summarizers*. Acton, M.A. Research for Better Teaching, Inc.

Announcement of Opportunity Letter

Dear Students:

NASA, the National Aeronautics and Space Administration, is seeking new and unique ideas for the next generation of robotic missions to explore the depths of space. The Discovery Program currently includes a total of ten missions: five spacecraft to explore comets and asteroids; one to land a rover on Mars, one to orbit Mercury, one to orbit the Moon, one to collect atoms of solar wind, and one to search for Earth-sized planets outside of our solar system.

You are invited to submit a proposal to the Discovery Program with your ideas for a space science investigation. Complete proposals will demonstrate knowledge of the Discovery Program and its missions. A proposal will explain the value of past, present, and future explorations of space to society and life on Earth. It will identify and describe new areas for scientific investigation, provide suggestions for technological developments, and list the types of experts needed to design, build, test, and launch a successful mission.

In order to assist you in responding to this call for proposals, we have enclosed a video that provides general information about the Discovery Program and the individual missions. In addition, you will receive a list of important Internet sites that provide greater detail about each mission and a timeline.

Proposals are restricted to two pages. You should describe the science goals of your proposed mission and explain its value to science and society. Please include suggested dates for launch and a timeline for meeting the science objectives of your mission. Additional pages may include one design drawing of the spacecraft, approximate mission costs, the types of people needed to design, build, test, launch, and maneuver the spacecraft, and the way in which scientists are involved in all stages of the mission.

The Discovery Program staff at NASA looks forward to receiving your response. Thank you in advance for your interest and hard work.

Sincerely,

Paul A. Gilbert

Paul A. Gilbert, Discovery Program Manager

Unlocking the Mysteries:
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Viewing Guide

Student Video Guide

Directions
For each mission highlighted in the video, *Unlocking Mysteries of Our Solar System*, choose the correct classification: asteroid/comet, Moon/planets/Sun, or extrasolar planet search. Then describe the mission in your own words.

Mission	Classification (Circle One)	Your Description
NEAR	Missions to Comets & Asteroids Missions to the Moon, the Planets, and the Sun Mission to locate planets outside our solar system	
Dawn	Missions to Comets & Asteroids Missions to the Moon, the Planets, and the Sun Mission to locate planets outside our solar system	
Stardust	Missions to Comets & Asteroids Missions to the Moon, the Planets, and the Sun Mission to locate planets outside our solar system	
CONTOUR	Missions to Comets & Asteroids Missions to the Moon, the Planets, and the Sun Mission to locate planets outside our solar system	

Deep Impact	Missions to Comets & Asteroids Missions to the Moon, the Planets, and the Sun Mission to locate planets outside our solar system	
Lunar Prospector	Missions to Comets & Asteroids Missions to the Moon, the Planets, and the Sun Mission to locate planets outside our solar system	
Genesis	Missions to Comets & Asteroids Missions to the Moon, the Planets, and the Sun Mission to locate planets outside our solar system	
Mars Pathfinder	Missions to Comets & Asteroids Missions to the Moon, the Planets, and the Sun Mission to locate planets outside our solar system	
MESSENGER	Missions to Comets & Asteroids Missions to the Moon, the Planets, and the Sun Mission to locate planets outside our solar system	
Kepler	Missions to Comets & Asteroids Missions to the Moon, the Planets, and the Sun Mission to locate planets outside our solar system	

Questions

1. Look over your notes above. If you could choose three of the missions to learn more about, which three would you choose?

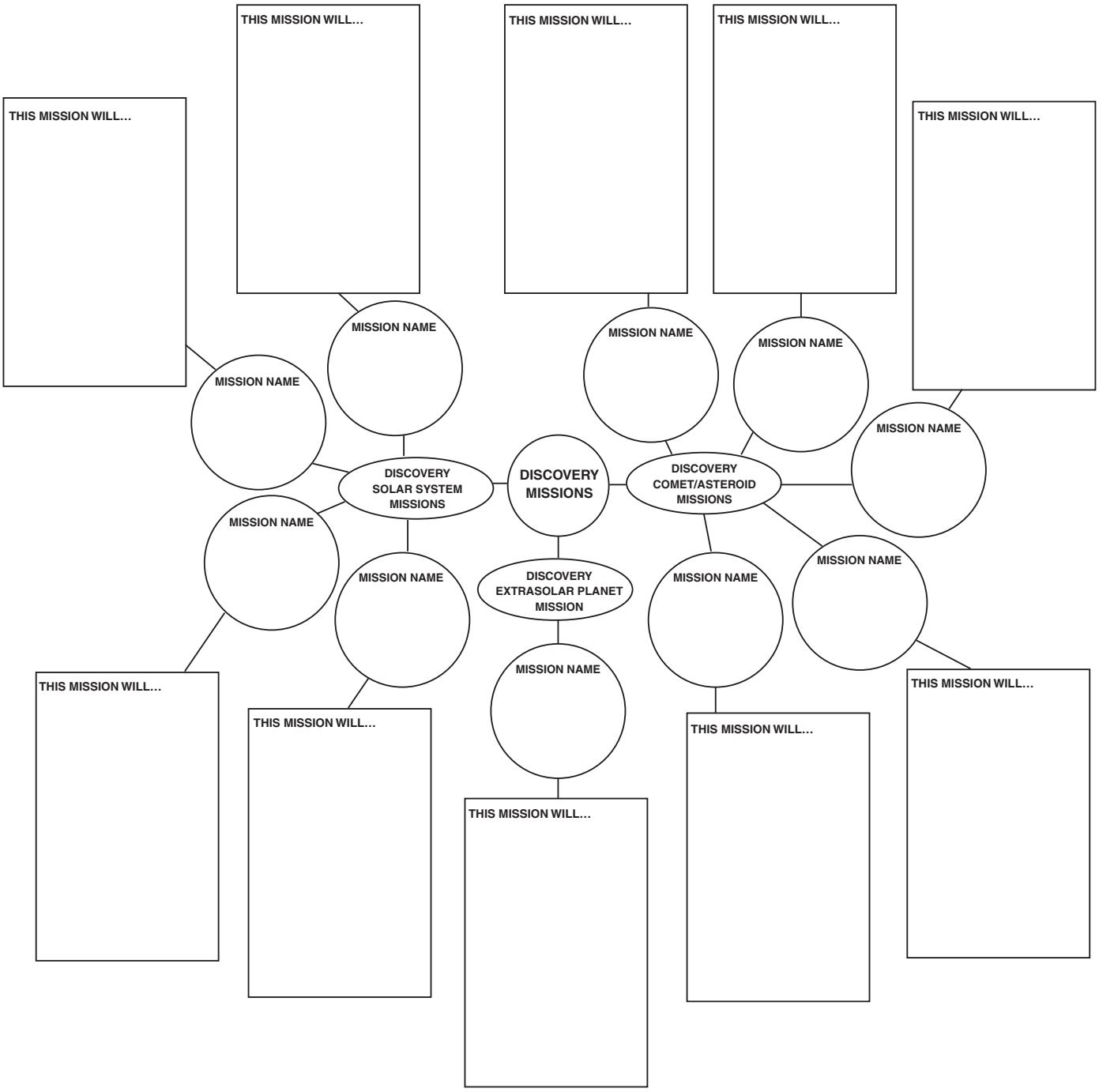
2. Do these missions have anything in common? How do they differ?

3. How do these missions contribute to accomplishing the Discovery Program's main objective: to enhance our understanding of the solar system—past and present?

4. If you could ask one mission's lead scientist a question, which mission would you choose, and what question would you ask?

Unlocking the Mysteries:
Science on the Edge of Our Solar System

Graphic Organizer



Unlocking the Mysteries:
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Mission Expert Research

Student Activity Sheet

Mission Name_____

Mission Internet Home Page URL_____

Launch Date and Destination_____

What are the science goals for this mission?

List the information and/or materials that the spacecraft is designed to collect.

_____

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Who are the people and the organizations that make this mission possible? List their names, job titles, and companies.

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Describe at least one unique and interesting thing that you learned about this mission. Explain why you think it is unique or interesting.

Draw a picture of the spacecraft for this mission. Label the parts of the craft and any instruments.

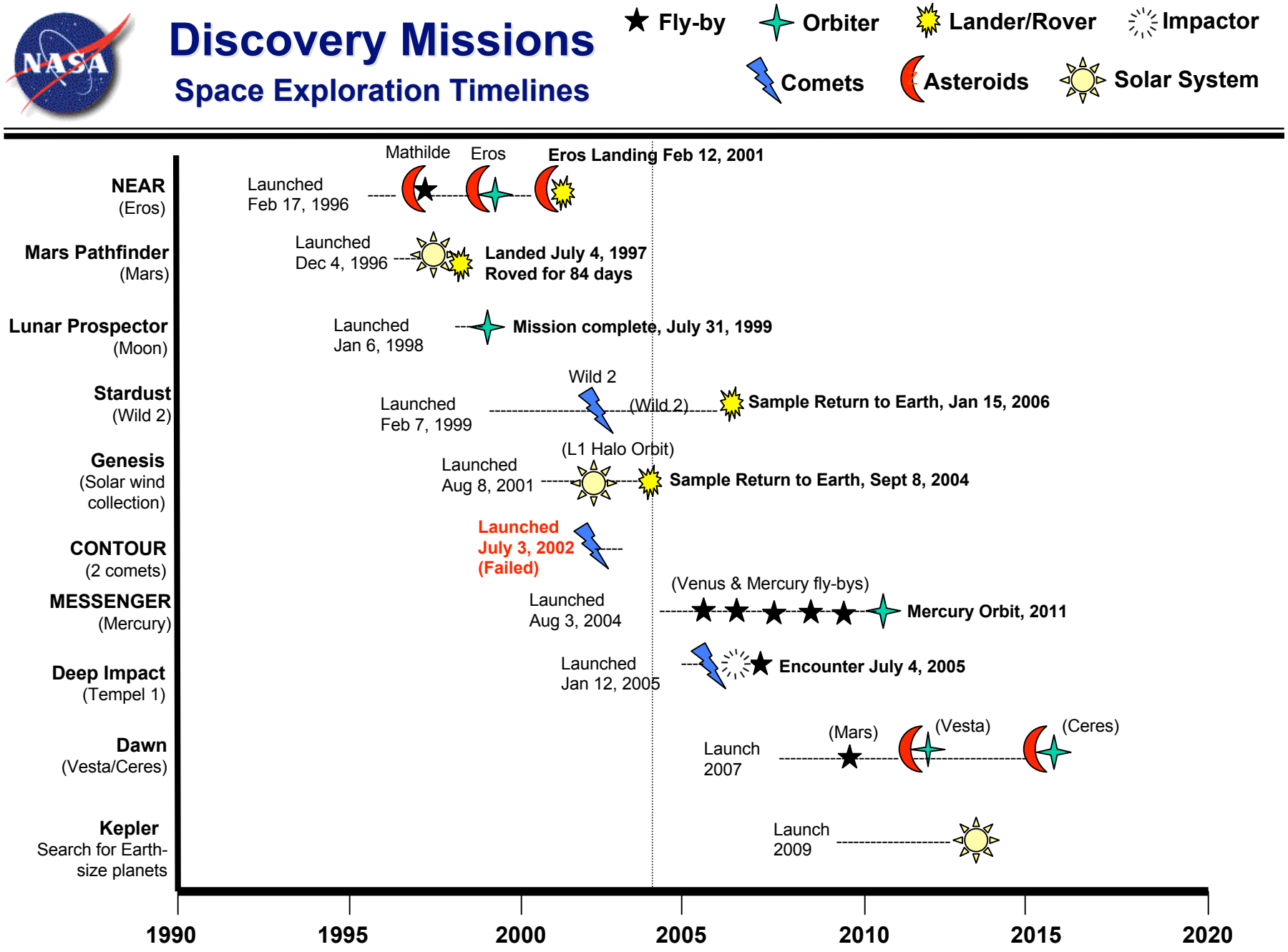
Explain why this mission is important to the overall Discovery Program. What does it contribute?

What questions do you still have about this mission that were not answered by your research?

As mission expert, why do you think society should support this mission? What does it contribute to people in general? Why should they pay for the mission?

Discovery Missions

Space Exploration Timelines



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Presenting the Research and Experiment Results

Student Activity Sheet

Directions

As the class experts for one of the Discovery Program missions, you will soon present to the class. **On a separate sheet of lined paper, write the lines for your presentation.** Make certain that you have a complete presentation and that each member of your team knows his or her part.

Below is a checklist of important topics to include in your presentation. A strong presentation includes the following:

Introduction	Research Results	Conclusion
• Introduce yourselves. • Name the mission. • Explain where it is going. • Give the launch date and dates when significant mission events occur. • Show an image of the spacecraft.	• Explain the purpose of the mission. What information is it searching for? • How will the information increase our understanding of space and Earth? • Describe any special instrumentation that was designed for this mission. • Are there any uses for this new instrumentation on Earth? • If you performed an experiment, briefly describe what you did and how it relates to your mission.	• Explain why this mission is important to the overall Discovery Program. • What is significant about the information that the mission will collect? • What did you learn as a result of your research that you felt was especially interesting? • Take questions. • Thank your audience.

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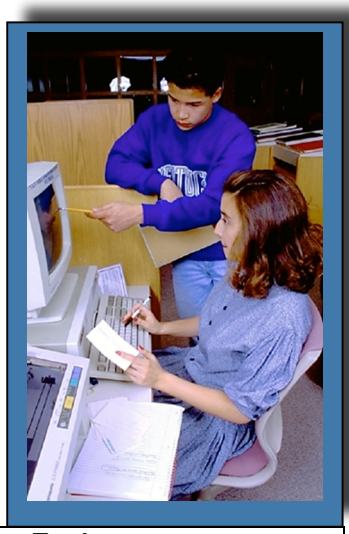
Internet Resources

Discovery Program home page: http://discovery.nasa.gov
Discovery and New Frontiers News (quarterly newsletters with information on mission status):
http://discoverynewfrontiers.nasa.gov/news/newsletters/index.html

Internet access required.



Many of the Discovery Program missions feature education sections on their Web sites:

Missions to Comets & Asteroids

- NEAR: http://near.jhuapl.edu/
- Stardust: http://stardust.jpl.nasa.gov/home/index.html
- Deep Impact: http://deepimpact.umd.edu/
- Dawn: http://dawn.jpl.nasa.gov/
- CONTOUR: http://discovery.nasa.gov/contour.html

Missions to the Moon, the Planets, and the Sun

- Mars Pathfinder: http://mpfwww.jpl.nasa.gov/MPF/default.html
- Lunar Prospector: http://lunar.arc.nasa.gov/
- Genesis: http://genesismission.jpl.nasa.gov/
- MESSENGER: http://messenger.jhuapl.edu/

Mission to locate planets outside our solar system (extrasolar planets)

- Kepler: www.kepler.arc.nasa.gov

Experiments and Activities

Mission	Activity Title	Topic
NEAR	Asteroid Resources – The Stepping Stone to Beyond	Research and document some of the requirements for mounting an expedition to an asteroid.
Stardust	Aerogel-lo	Simulate and observe the collection of particles using aerogel.
CONTOUR	Scale Model Comet	Learn some of the components of an active comet and the scale of an active comet relative to the Earth.
Deep Impact	Exploring Comets and Modeling for Mission Success	Learn how scientists explore comets and why mission teams perform modeling exercises on Earth to assure mission success in space.
Dawn	Ion Propulsion Engine Simulation	Experiment with designing an ion engine using an interactive simulation.
Mars Pathfinder	Mars Robotics Activities	Learn what it takes to design and build a robotic mission to the Red Planet.
Lunar Prospector	Reaping Rocks	Make predictions about the origin of lunar rocks using rocks from your neighborhood.
MESSENGER	Sensing the Invisible	Learn about forms of light other than the visible light emitted by the Sun.
Genesis	What Are We Made Of?	Learn about the elements that make up all things on Earth and in space and count elements extracted from simulated samples.
Kepler	Habitable Planets	Do activities to learn what it takes for a planet to support life as we find it on Earth.