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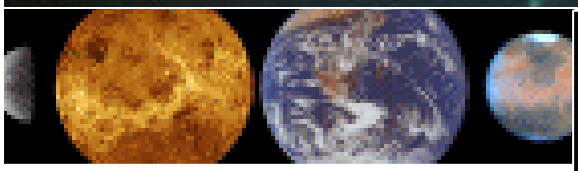
#10681
THE INNER SOLAR SYSTEM: MERCURY

AIMS MULTIMEDIA, 2003
Grade Level: 6-12
13 Minutes
4 Instructional Graphics Included



AIMS MULTIMEDIA
TEACHING MODULE

CAPTIONED MEDIA PROGRAM RELATED RESOURCES

#2618 JOURNEY THROUGH THE SOLAR SYSTEM
#3155 MERCURY AND VENUS: MARS
#8849 OUR SOLAR SYSTEM
#10582 HOW AND WHY: VOLUME 7—PLANETS AND SPACE TRAVEL

Funding for the Captioned Media Program is provided by the U.S. Department of Education

The Space Files: The Inner Solar System

INTRODUCTION TO THE AIMS TEACHING MODULE (ATM)

INTRODUCING *The Space Files: The Inner Solar System*

PREPARATION FOR VIEWING

AFTER VIEWING THE PROGRAM

Congratulations!

You have chosen a learning program that will actively motivate your students and provide you with easily accessible and easily manageable instructional guidelines and tools designed to make your teaching role efficient and rewarding.

The AIMS Teaching Module (ATM) provides you with a video program correlated to your classroom curriculum, instructions and guidelines for use, plus a comprehensive teaching program containing a wide range of activities and ideas for interaction between all content areas. Our authors, educators, and consultants have written and reviewed the AIMS Teaching Modules to align with the Educate America Act: Goals 2000.

This ATM, with its clear definition of manageability, both in the classroom and beyond, allows you to tailor specific activities to meet all of your classroom needs.

RATIONALE

In today's classrooms, educational pedagogy is often founded on Benjamin S. Bloom's "Six Levels of Cognitive Complexity." The practical application of Bloom's Taxonomy is to evaluate students' thinking skills on these levels, from the simple to the complex:

1. Knowledge (rote memory skills),
2. Comprehension (the ability to relate or retell),
3. Application (the ability to apply knowledge outside its origin),
4. Analysis (relating and differentiating parts of a whole),
5. Synthesis (relating parts to a whole)
6. Evaluation (making a judgment or formulating an opinion).

The AIMS Teaching Module is designed to facilitate these intellectual capabilities, and to integrate classroom experiences and assimilation of learning with the students' life experiences, realities, and expectations. AIMS' learner verification studies prove that our AIMS Teaching Modules help students to absorb, retain, and to demonstrate ability to use new knowledge in their world. Our educational materials are written and designed for today's classroom, which incorporates a wide range of intellectual, cultural, physical, and emotional diversities.

ORGANIZATION AND MANAGEMENT

To facilitate ease in classroom manageability, the AIMS Teaching Module is organized in three sections:

I. Introducing this ATM
will give you the specific information you need to integrate the program into your classroom curriculum.

II. Preparation for Viewing
provides suggestions and strategies for motivation, language preparedness, readiness, and focus prior to viewing the program with your students.

III. After Viewing the Program
provides suggestions for additional activities plus an assortment of consumable assessment and extended activities, designed to broaden comprehension of the topic and to make connections to other curriculum content areas.

AIMS Teaching Module written by Patricia A. Peirson.

AIMS Multimedia is a leading producer and distributor of educational programs serving schools and libraries since 1957. AIMS draws upon the most up-to-date knowledge, existing and emerging technologies, and all of the instructional and pedagogical resources available to develop and distribute educational programs in videocassette and CD-ROM.

Persons or schools interested in obtaining additional copies of this AIMS Teaching Module, please contact:

AIMS Multimedia at:
Toll Free: 1-800-367-2467
Fax: 818-341-6700
Web: www.aimsmultimedia.com
Email: info@aimsmultimedia.com

FEATURES
INTRODUCING THE ATM

Your AIMS Teaching Module is designed to accompany a video program written and produced by some of the world's most credible and creative writers and producers of educational programming. To facilitate diversity and flexibility in your classroom and to provide assessment tools, your AIMS Teaching Module features these components:

Themes

This section tells how the AIMS Teaching Module is correlated to the curriculum. Themes offers suggestions for interaction with other curriculum content areas, enabling teachers to use the teaching module to incorporate the topic into a variety of learning areas.

Overview

The Overview provides a synopsis of content covered in the video program. Its purpose is to give you a summary of the subject matter and to enhance your introductory preparation.

Objectives

The ATM learning objectives provide guidelines for teachers to assess what learners can be expected to gain from each program. After completion of the AIMS Teaching Module, your students will be able to demonstrate dynamic and applied comprehension of"" the topic.

Preparation for Viewing

In preparation for viewing the video program, the AIMS Teaching Module offers activity and/or discussion ideas that you may use in any order or combination.

Introduction To The Program

Introduction to the Program is designed to enable students to recall or relate prior knowledge about the topic and to prepare them for what they are about to learn.

Introduction To Vocabulary

Introduction to Vocabulary is a review of language used in the program: words, phrases, and usage. This vocabulary introduction is designed to ensure that all learners, including limited English proficiency learners, will have full understanding of the language usage in the content of the program.

Discussion Ideas

Discussion Ideas are designed to help you assess students' prior knowledge about the topic and to give students a preview of what they will learn. Active discussion stimulates interest in a subject and can motivate even the most reluctant learner. Listening, as well as speaking, is active participation. Encourage your students to participate at the rate they feel comfortable. Model sharing personal experiences when applicable, and model listening to students' ideas and opinions.

Focus

Help learners set a purpose for watching the program with Focus, designed to give students a focal point for comprehension continuity.

Jump Right In

Jump Right In provides abbreviated instructions for quick management of the program.

After Viewing the Program

After your students have viewed the program, you may introduce any or all of these activities to interact with other curriculum content areas, provide reinforcement, assess comprehension skills, or provide hands-on and in-depth extended study of the topic.

SUGGESTED ACTIVITIES

The Suggested Activities offer ideas for activities you can direct in the classroom or have your students complete independently, in pairs, or in small work groups after they have viewed the program. To accommodate your range of classroom needs, the activities are organized into skills categories. Their labels will tell you how to identify each activity and help you correlate it into your classroom curriculum. To help you schedule your classroom lesson time, the AIMS hourglass gives you an estimate of the time each activity should require. Some of the activities fall into these categories:

Meeting Individual Needs

These activities are designed to aid in classroom continuity. Reluctant learners and learners acquiring English will benefit from these activities geared to enhance comprehension of language in order to fully grasp content meaning.

Curriculum Connections

Many of the suggested activities are intended to integrate the content of the ATM program into other content areas of the classroom curriculum. These cross-connections turn the classroom teaching experience into a whole learning experience.

Critical Thinking

Critical Thinking activities are designed to stimulate learners' own opinions and ideas. These activities require students to use the thinking process to discern fact from opinion, consider their own problems and formulate possible solutions, draw conclusions, discuss cause and effect, or combine what they already know with what they have learned to make inferences.

Cultural Diversity

Each AIMS Teaching Module has an activity called Cultural Awareness, Cultural Diversity, or Cultural Exchange that encourages students to share their backgrounds, cultures, heritage, or knowledge of other countries, customs, and language.

Hands On

These are experimental or tactile activities that relate directly to the material taught in the program. Your students will have opportunities to make discoveries and formulate ideas on their own, based on what they learn in this unit.

Writing

Every AIMS Teaching Module will contain an activity designed for students to use the writing process to express their ideas about what they have learned. The writing activity may also help them to make the connection between what they are learning in this unit and how it applies to other content areas.

In The Newsroom

Each AIMS Teaching Module contains a newsroom activity designed to help students make the relationship between what they learn in the classroom and how it applies in their world. The purpose of In The Newsroom is to actively involve each class member in a whole learning experience. Each student will have an opportunity to perform all of the tasks involved in production: writing, researching, producing, directing, and interviewing as they create their own classroom news program.

Extended Activities

These activities provide opportunities for students to work separately or together to conduct further research, explore answers to their own questions, or apply what they have learned to other media or content areas.

Link to the World

These activities offer ideas for connecting learners' classroom activities to their community and the rest of the world.

Culminating Activity

To wrap up the unit, AIMS Teaching Modules offer suggestions for ways to reinforce what students have learned and how they can use their new knowledge to enhance their worldview.

ADDITIONAL ATM FEATURES

Vocabulary

Every ATM contains an activity that reinforces the meaning and usage of the vocabulary words introduced in the program content. Students will read or find the definition of each vocabulary word, then use the word in a written sentence.

Checking Comprehension

Checking Comprehension is designed to help you evaluate how well your students understand, retain, and recall the information presented in the AIMS Teaching Module. Depending on your students' needs, you may direct this activity to the whole group yourself, or you may want to have students work on the activity page independently, in pairs, or in small groups. Students can verify their written answers through discussion or by viewing the video a second time. If you choose, you can reproduce the answers from your Answer Key or write the answer choices in a Word Bank for students to use. Students can use this completed activity as a study guide to prepare for the test.

Reproducible Activities

The AIMS Teaching Module provides a selection of reproducible activities, designed to specifically reinforce the content of this learning unit. Whenever applicable, they are arranged in order from low to high difficulty level, to allow a seamless facilitation of the learning process. You may choose to have students take these activities home or to work on them in the classroom independently, in pairs or in small groups.

Checking Vocabulary

The checking Vocabulary activity provides the opportunity for students to assess their knowledge of new vocabulary with this word game or puzzle. The format of this vocabulary activity allows students to use the related words and phrases in a different context.

Test

The AIMS Teaching Module Test permits you to assess students' understanding of what they have learned. The test is formatted in one of several standard test formats to give your students a range of experiences in test-taking techniques. Be sure to read, or remind students to read, the directions carefully and to read each answer choice before making a selection. Use the Answer Key to check their answers.

Additional AIMS Multimedia Programs

After you have completed this AIMS Teaching Module you may be interested in more of the programs that AIMS offers. This list includes several related AIMS programs.

Answer Key

Reproduces tests and work pages with answers marked.

JUMP RIGHT IN

Preparation

- Read The Space Files: The Inner Solar System **Themes, Overview,** and **Objectives** to become familiar with program content and expectations.
- Use **Preparation for Viewing** suggestions to introduce the topic to students.

Viewing

- Set up viewing monitor so that all students have a clear view.
- Depending on your classroom size and learning range, you may choose to have students view The Space Files: The Inner Solar System together or in small groups.
- Some students may benefit from viewing the video more than one time.

After Viewing

- Select Suggested Activities that integrate into your classroom curriculum. If applicable, gather materials or resources.
- Choose the best way for students to work on each activity. Some activities work best for the whole group. Other activities are designed for students to work independently, in pairs, or in small groups. Whenever possible, encourage students to share their work with the rest of the group.
- Duplicate the appropriate number of Vocabulary, Checking Comprehension, and consumable activity pages for your students.
- You may choose to have students take consumable activities home, or complete them in the classroom, independently, or in groups.
- Administer the Test to assess students' comprehension of what they have learned, and to provide them with practice in test-taking procedures.
- Use the Culminating Activity as a forum for students to display, summarize, extend, or share what they have learned with each other, the rest of the school, or a local community organization.

The Space Files: The Inner Solar System

Themes

These programs focus on the inner solar system - the celestial region stretching from the Sun and its closest planet, Mercury, to Mars, Earth's closest neighbor. Also featured are a close-up look at Earth's moon and an exploration of the spectacular phenomena of eclipses and the aurora borealis. As its central theme, the SpaceFiles Series: Inner Solar System provides an in-depth examination of the origins, physical characteristics, movement, and relative position of each terrestrial planet, our system's star, and Earth's moon. The likelihood of current or past life-form existence is also discussed.

Overview

The SpaceFiles Series encompasses the fundamentals of space and astronomy. The Inner Solar System titles deal with the Sun, the terrestrial planets, Earth's moon, eclipses, and the phenomenon of the aurora borealis.

Note: Many of the activities and assessments contained in this teaching module may be used with all seven programs in the SpaceFiles - The Inner Solar System series. Other additional activities and consumables are meant for specific Inner Solar System videos, and are labeled as such.

The Inner Solar System: The Sun begins at the center of things: our system's own star. The Sun is the energy source that powers the Earth and has inspired mythology in almost all cultures, including the ancient Egyptians, Aztecs, Native Americans, and Chinese. It is a huge, bright sphere of mostly ionized gas, about 5 billion years old, and is the closest star to Earth at a distance of about 150 million kilometers. In addition to discussing the elemental composition of the Sun, the program details solar activities, from sunspots to prominences and solar winds.

Next, Inner Solar System: Mercury takes us to the baked, rocky planet closest to the Sun. Smallest of the terrestrials, Mercury speeds around the Sun in a wildly elliptical orbit that takes it as close as 47 million kilometers and as far as 70 million kilometers from the Sun. How planets and the planetary system formed is explained and illustrated in this program.

Inner Solar System: Venus brings us to a lifeless world shrouded in cloud. At first glance, if Earth had a twin, it would be Venus. The two planets are similar in size, mass, composition, and distance from the Sun. But there the similarities end. Venus is a planet suffering from a run-away greenhouse effect, with a choking atmosphere and temperatures hot enough to melt lead.

Inner Solar System: Earth, explores our home planet - third planet from the Sun and the fifth largest in the Solar System. Positioned at nearly 150 million kilometers from the Sun, and situated in the center of the habitable zone as we understand it, Earth is the only planet in our Solar System known to harbor life - life that is incredibly diverse.

Inner Solar System: The Moon presents the origins of Earth's only natural satellite. The regular daily and monthly rhythms of this small, yet vital celestial partner have guided timekeepers for thousands of years. Its influence on Earth's cycles, notably tides, has been charted by many cultures in many ages. The Moon's lunar phases, effects on Earth's tides, elemental characteristics, and topography are examined, along with scientific data gathered from the lunar explorations of astronauts.

Inner Solar System: Eclipses and Auroras offers students spectacular images of a total eclipse of the Sun, an event which occurs about seventy times every century. Students will also discover the genesis of the dramatic natural light shows created by electrically charged particles in the solar winds - the aurora borealis.

Inner Solar System: Mars introduces students to the world humans may visit next. The red planet Mars has inspired wild flights of imagination over the centuries, as well as intense scientific interest. Mars is a small rocky body once thought to be very Earth-like. Discovery of vast, frozen underground water deposits has stirred hope that, despite the severity of its surface and atmospheric conditions, life exists in some form on the red planet.

Objectives

- To explore the Sun, Moon, and terrestrial planets of our solar system
- To examine the origins, size, temperature, and physical properties of the Sun
- To discuss the origins and observe the unique surface and atmospheric features of each celestial body
- To learn about the size and relative position of each planet in the inner solar system
- To discuss the characteristics of Earth that allow for life
- To examine the phenomena of solar and lunar eclipses, solar flares, and the aurora borealis
- To encourage a deeper appreciation of astronomy and further exploration of the solar system and beyond

Introduction to the Program

Ask students to share what they know about the origins of the Sun and planets in the solar system. Review with students the names of the nine planets and their positions relative to the Sun. Ask students what area in our solar system lies between Mars and Jupiter (the asteroid belt). Explain to students that the program they will be viewing involves the inner solar system - the Sun and the four planets orbiting between the Sun and the asteroid belt (also called the terrestrial planets).

Introduction to Vocabulary

The following words are referenced in The Inner Solar System videos. Write the terms on the board; ask the class to discuss the meaning of each word, and review the terms that are unfamiliar to students. You may wish to have students look up terms in a dictionary or encyclopedia.

axis
Celsius (32∫ Fahrenheit = 0 ∫ Celsius, or freezing point; 212∫ F = 100∫ C, or boiling point)
diameter
kilometer (equals 0.6214 miles, or 1 mile = 1.609 kilometers)
moon
orbit
planet
planetesimal (one of the many small, solid celestial bodies thought to have existed at an early stage in the development of the solar system)
rotation
solar system
star
terrestrial
topography

Discussion Ideas

Ask one or more of the following questions to prompt discussion about space exploration: What are the necessary components to sustain life on Earth? (These should include atmosphere, light, heat, cold, water, soil, and air, all occurring in delicate balance.) What role does the Sun play in sustaining life? Why do you think it is important to understand the Sun and the other planets in our solar system? What potential do you think there is for finding life on other planets, either within our solar system or somewhere else in the universe? Explain your response.

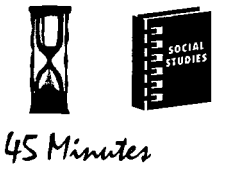
Focus

Encourage students to watch for similarities and differences between other planets and Earth's moon and Earth itself, such as size, rotational direction, composition, atmosphere, and potential to support life. Ask them to keep in mind each celestial body's position relative to the Sun and the effect of that positioning.

SUGGESTED ACTIVITIES

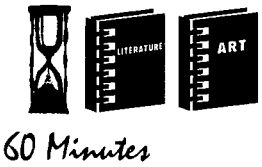
All Inner Solar System Programs
Meeting Individual Needs

Following the viewing of each program, ask students to recall some of the highlights and specific information presented. List their responses on the board. Clarify information as needed. If necessary, provide suggestions of your own to trigger additional responses and stimulate discussion.



All Inner Solar System Programs
Connection to Social Studies

There is an on-going controversy concerning the value of space exploration. Some people believe that such exploration is a needless waste of money, a drain on our Federal budget, and has produced little that benefits the day-to-day life of the individual. Others would argue that valuable information is being gathered, inventions and technology are being developed that find application in our day-to-day lives, and such exploration may potentially provide answers and solutions to pressing questions and problems right here on Earth. Have students research the pros and cons of space exploration. Organize a class debate to discuss these issues.

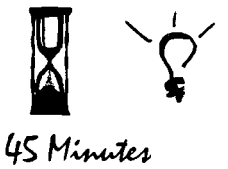


All Inner Solar System Programs
Connection to Literature/Arts and Humanities

In many cultures, the population's ancestors believed that the sky was the home of gods, goddesses, and other supernatural beings. The planets themselves were thought to be these immortal creatures. We still use their names for the planets and moons today.

Using library, Internet or other resources, have students research the mythology of different cultures associated with the Sun, Mercury, Venus, Earth, the Moon, and Mars. More advanced students may wish to research how the early Greeks attempted through their myths to explain the movement of heavenly bodies.

Have students share their findings in an informal discussion or through presentation of oral reports. Discuss with students how such myths originated as our ancestors attempted to understand the world.



All Inner Solar System Programs
Critical Thinking

There have been a number of theories concerning the origins of the solar system. For example, in the late 1700s, French scientist Comte de Buffon suggested that a giant comet passing the Sun pulled out the matter from which the solar system emerged. Over time, other theories have been formulated. Ask students to research some of these theories to learn more about them.

Following their research, organize a class discussion or debate which allows students to present the theories they support or find most interesting. Encourage students to provide scientific evidence for their choices.

All Inner Solar System Programs
Connection to Science and History

45 Minutes

Since scientific study of the cosmos began, there have been a number of objects that were once thought to exist by astronomers, but which later "vanished." Student may readily associate some of their names with people and places in today's popular science fiction. They include: Vulcan - the intra-Mercurial planet; Mercury's moon; Neith - the moon of Venus; Earth's supposed second moon; the first theoretical moons of Mars; and Nemesis - the Sun's "companion star."

Have students research these or other hypothetical planets and "vanished" objects. Internet sites such as http://www.seds.org/nineplanets/nineplanets/hypo.html are excellent sources of information. Ask students to share their findings in a general class discussion. Students should understand what led to the faulty identification of an object, and what, if any, contribution the event made to future understanding of the universe.

All Inner Solar System Programs
Extended Activity


Extended

Provide students with the names of the space probes mentioned in the programs (see list below). Individually or in small groups, have students prepare a multimedia presentation that includes pictures of the space probe, the significance of its name, the launch date, its purpose, its discoveries, and some images sent back to Earth. Conclude with an analysis of the success or failure of the space probe.

Mariner 10
Venera 7 (1970s Russian space probe to Venus)
Magellan
Mars Global Surveyor
Mars Odyssey
Mars Express
The Apollo Missions

As an alternative, students may wish to report on planned space probes, such as Bepi-Colombo or Messenger (Mercury), or the Mars Exploration Rover project.

Inner Solar System: The Sun
Writing


60 Minutes

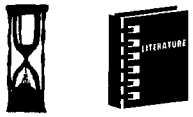
Why We Study the Sun: Ask students to prepare a report on the range of information that we gather from study of the Sun, as well as the application and importance of that information. The Internet is an excellent research tool for this activity.

Inner Solar System: Mercury
Connection to Space Science

45 Minutes

In this program, the formation of Mercury is used to demonstrate the process by which other planets and our solar system were formed. Ask students to write a brief description of the process. Preliminary class discussion or research may be necessary.

Inner Solar System: Venus
Connection to Literature



Extended

Have students read the short story by Ray Bradbury entitled "The Long Rain" (a selection from his book "The Illustrated Man"). The story provides an excellent example of our perception of Venus before science revealed the true nature of the planet. Discuss the story in light of what is known today. How does current knowledge impact the reader's ability to enjoy stories such as this one?

Inner Solar System: Earth
Connection to Earth Science

45 Minutes

Before scientific exploration and discovery revealed the true physical make-up of our neighboring planets, we imagined the surface of Venus and Mars to be populated by fantastic creatures living in cloud-shrouded jungles or arid deserts. Then robotic spacecrafts showed us images of barren vistas, seemingly inhospitable to life, and dashed all hope of finding extraterrestrial life. However, recent discoveries on our own planet have revealed that life exists on the Earth under the most "unlifelike" conditions. For example, we have discovered anaerobic life, and life existing in all temperature extremes, in toxic gas environments, inside a rock, or in a pool of acid.

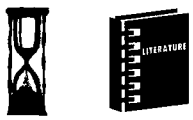
Using the library and Internet resources, have students research recent discoveries of life forms which exist under unexpected and extreme conditions on Earth, and have them present their findings to the rest of the class. This may be done during a general class discussion or as a formal oral report.

Inner Solar System: Earth
Writing


Extended

Using the information gathered in the Connection to Earth Science research on life forms which exist under extreme conditions, discuss the possibility of life existing in some form on one of the other planets of the inner solar system. Next, ask students to write a short fiction story with this topic as its theme. Have students present finished stories to the class. Teachers may wish to compile and photocopy the stories to create a class science fiction short story booklet.

Inner Solar System: The Moon
Connection to Literature



Extended

The Moon continues to be a rich source of inspiration for science fiction authors. Provide students with an age/grade level appropriate list of short stories or novels by renowned science fiction authors such as H. G. Wells, Jules Verne, Ray Bradbury, Isaac Asimov, Arthur C. Clarke, or Robert A. Heinlein. After reading the selected story or novel, have students prepare a book review of the work.

Inner Solar System: The Moon
Hands On


15 Minutes

Making a Crater - Class Demonstration: Items needed: 9x12 inch cake pan; dry Plaster of Paris powder; dry Portland Cement powder; tablespoon.

Fill a 9x12 inch cake pan with dry Plaster of Paris powder (not wet). The plaster powder needs to be 11/2 to 2 inches deep. Put the pan of dry plaster powder on the floor, or on the ground if you choose to conduct this demonstration out of doors. Take a heaping tablespoon of dry Portland Cement powder (readily available in any hardware store). Hold the heaping tablespoon of cement 3 to 4 feet over the pan and dump it all in one motion into the pan. (The aim is to dump it as one lump.) The result is a beautifully created "moon crater", complete with ray structures and center peak.

Inner Solar System: Eclipses and Auroras
Connection to Space Science/Hands On

Extended

There are certain safety procedures people must follow when viewing an eclipse. Have students research eclipse observation tips, precautions and methods, then share their findings in a general discussion of the topic. Next, using the Internet as a resource, have students find a listing for upcoming eclipses. If possible, involve the class in observation of an eclipse. As an additional activity, teachers may wish to help students construct their own pinhole projector for viewing the event.

Inner Solar System: Mars
Connection to Space Science/Writing

60 Minutes

Mars may well be the next planet on which humans walk and which they will possibly inhabit. The first step in making any planet habitable is terraforming. Have students research the topic of terraforming and its application to Mars. The Internet is an excellent source of information. Then ask students to prepare a report in which they discuss the procedure as well as the feasibility of terraforming the planet. As an alternative to a report, ask students to write a short science fiction story which involves the terraforming of Mars.

All Inner Solar System Programs
Culminating Activity


Extended

If possible, arrange for students to visit a planetarium or a museum that has a space exhibit. As an alternative, ask a local astronomer to speak to the class about his or her experience and observations, or arrange for a traveling planetary show to visit your school. Following the activity of choice, discuss with students what they learned, most enjoyed, or found the most interesting about the experience.

Name

ALL INNER SOLAR SYSTEM PROGRAMS
INNER SOLAR SYSTEM FACT SHEET

Use copies of the following form to outline important information gathered on each planet or other celestial body explored in the program. (NOTE: some information fields may not be applicable to all program topics.)

1. Name of planet or celestial body: _____

2. Type of celestial body: (i.e., planet, star, moon, etc.)_____

3. Position in the solar system relative to the Sun: _____

4. Position in the solar system relative to Earth: _____

5. Diameter: _____

6. Topography (general): _____

7. Three major geographic features: _____

8. Atmosphere: _____

9. Weather:_____

10. Temperature range:_____

11. Period of rotation: _____

12. Period of orbit (revolution around the Sun): _____

13. Space craft and/or mission involved in exploration: _____

14. Potential for life: _____

ANSWER KEY for page 12

ALL INNER SOLAR SYSTEM PROGRAMS
INNER SOLAR SYSTEM FACT SHEET

Use copies of the following form to outline important information gathered on each planet or other celestial body explored in the program. (NOTE: some information fields may not be applicable to all program topics.)

1. Name of planet or celestial body: **INFORMATION WILL VARY ACCORDING TO PLANET, STAR, OR MOON SELECTED.**

2. Type of celestial body: (i.e., planet, star, moon, etc.) _____

3. Position in the solar system relative to the Sun: _____

4. Position in the solar system relative to Earth: _____

5. Diameter: _____

6. Topography (general): _____

7. Three major geographic features: _____

8. Atmosphere: _____

9. Weather: _____

10. Temperature range: _____

11. Period of rotation: _____

12. Period of orbit (revolution around the Sun): _____

13. Space craft and/or mission involved in exploration: _____

14. Potential for life: _____

Name

ALL INNER SOLAR SYSTEM PROGRAMS
WORD SEARCH

The following words can be found in the maze below. The letters may be arranged horizontally, vertically, diagonally, or backwards.

S Z Q H D V J Z G X Y M W V H
B T E N A L P W K O R B I T Z
Z X A Y Q M V H D N Z G J E M
W R N R Z K B C V X P Q K R Y
Q O V G Y Q D I A M E T E R J
B T Z J C H M X W Z N Y S E B
S A N C E N I Q K R A L O S Z
Z T Y H L S B J Z M X V M T J
K I J V S W V G X Q Y H Z R W
M O O N I Z R E T E M O L I K
G N L Y U V X Q S K V Y G A Q
Z W J K S G B Z J R A N U L H
H Y X Z B Q N M Q W G Z B V J
B T O P O G R A P H Y H Q Y Z
V Z W L A M I S E T E N A L P

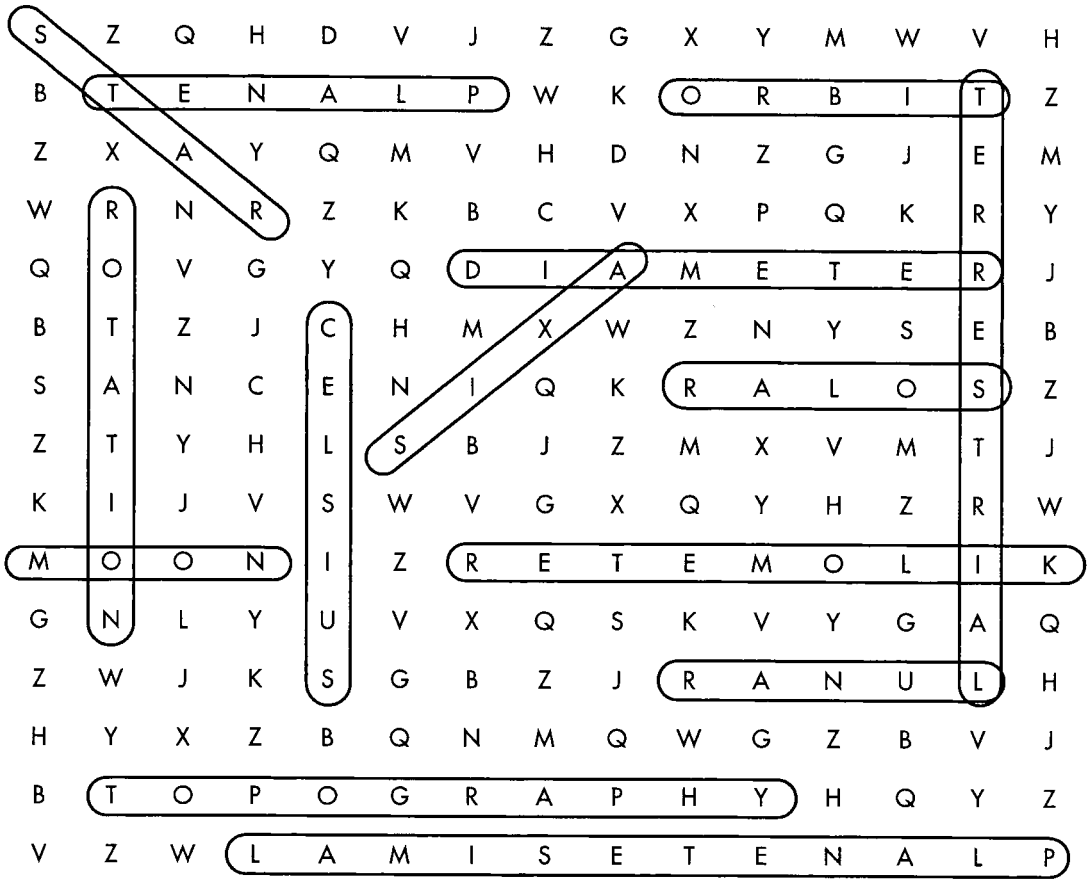
WORD BANK

axis
Celsius
diameter
kilometer
lunar
moon
orbit
planet
planetesimal
rotation
solar
star
terrestrial
topography

ANSWER KEY for page 13

ALL INNER SOLAR SYSTEM PROGRAMS
WORD SEARCH

The following words can be found in the maze below. The letters may be arranged horizontally, vertically, diagonally, or backwards.



WORD BANK

axis
Celsius
diameter
kilometer
lunar
moon
orbit
planet
planetesimal
rotation
solar
star
terrestrial
topography

Name

INNER SOLAR SYSTEM: MERCURY
CHECKING COMPREHENSION - SHORT ANSWER QUESTIONS

Answer each of the following questions in one or two sentences. Please use full sentences.

1. What is Mercury's relative size and position in the solar system? _____

2. How far is Mercury from the Sun? _____

3. How do the terrestrial planets like Mercury differ in composition from the larger planets such as Jupiter? _____

4. What are planetesimals? _____

5. How does the size of a planet body affect its gravitational pull? _____

6. How does Mercury's solar orbit compare to Earth's? _____

7. What was Mariner 10's mission? _____

8. What technique for space travel did Mariner 10 first use? _____

9. What are the unique characteristics of Mercury's rotation and solar orbit? _____

10. Mercury's iron core makes up 70% of its volume. What is the possible explanation for this? _____

11. Why do scientists believe there may be permanent ice deposits on Mercury? _____

12. What more do scientists hope to learn from Mercury through various probes and fly-bys? _____

ANSWER KEY for page 17

INNER SOLAR SYSTEM: MERCURY
CHECKING COMPREHENSION - SHORT ANSWER QUESTIONS

Answer each of the following questions in one or two sentences. Please use full sentences.

1. What is Mercury's relative size and position in the solar system? **Mercury is the closest planet to the Sun; it is the smallest of the planets -18 times smaller than Earth.**

2. How far is Mercury from the Sun? **Mercury is 58 million kilometers from the Sun.**

3. How do the terrestrial planets like Mercury differ in composition from the larger planets such as Jupiter? **Terrestrials are more solid, formed from heavy materials with a high melting point, in contrast to the great spheres of gas like Jupiter which are composed of lighter elements.**

4. What are planetesimals? **These are mini-planets which existed at an early stage in the development of the solar system.**

5. How does the size of a planet body affect its gravitational pull? **The bigger the body, the stronger its gravitational pull.**

6. How does Mercury's solar orbit compare to Earth's? **Mercury's orbit takes 88 days; Earth's takes 365.**

7. What was Mariner 10's mission? **Mariner 10's three fly-bys of Mercury photographed the surface and provided scientists with a pristine record of the early solar system.**

8. What technique for space travel did Mariner 10 first use? **It used a technique called "gravity assist" which used the pull of Venus as a push towards Mercury.**

9. What are the unique characteristics of Mercury's rotation and solar orbit? **Its rotation is so slow that its day is twice as long as its year - 176 Earth days equals 1 day on Mercury. Mercury's year is just 88 Earth days.**

10. Mercury's iron core makes up 70% of its volume. What is the possible explanation for this? **Early in its history, Mercury may have been struck by a large planetesimal which blew off the planet's outer mantle.**

11. Why do scientists believe there may be permanent ice deposits on Mercury? **Radar mapping suggests permanent ice deposits in deep craters at the poles.**

12. What more do scientists hope to learn from Mercury through various probes and fly-bys? **They hope to map more of the planet surface and to better understand what shaped the planet.**

Name

INNER SOLAR SYSTEM: MERCURY
TEST

Circle the letter of the correct answer for each question.

1. In the formation of the solar system, the terrestrial planets:
   a) were composed of the heaviest elements.
   b) were less dense than the outer planets like Jupiter.
   c) were the only forming bodies with any gravitational pull.
   d) A and C

2. Mercury has a solar orbit of:
   a) 28 days.
   b) 225 days.
   c) 88 days.
   d) 365 days.

3. The Earth is _____ more massive than Mercury.
   a) 10 times
   b) 18 times
   c) 13 times
   d) 25 times

4. A day on Mercury would equal:
   a) 88 Earth days.
   b) 2 Earth days.
   c) 176 Earth days.
   d) 18 Earth days.

5. Mercury's core is composed of:
   a) iron.
   b) molten lava.
   c) unknown metals.
   d) nickel.

ANSWER KEY for page 18

INNER SOLAR SYSTEM: MERCURY
TEST

Circle the letter of the correct answer for each question.

1. In the formation of the solar system, the terrestrial planets:

   a) were composed of the heaviest elements.

   b) were less dense than the outer planets like Jupiter.

   c) were the only forming bodies with any gravitational pull.

   d) A and C

2. Mercury has a solar orbit of:

   a) 28 days.

   b) 225 days.

   c) 88 days.

   d) 365 days.

3. The Earth is _____ more massive than Mercury.

   a) 10 times

   b) 18 times

   c) 13 times

   d) 25 times

4. A day on Mercury would equal:

   a) 88 Earth days.

   b) 2 Earth days.

   c) 176 Earth days.

   d) 18 Earth days.

5. Mercury's core is composed of:

   a) iron.

   b) molten lava.

   c) unknown metals.

   d) nickel.

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#9084-EN-VID The Solar System: Our Neighbors in Space
#8480-EN-VID Space Probes and Starships
#8724-EN-VID Top Flight
#9082-EN-VID The Universe: The Vast Frontier