



Journey Through the Solar System

Post-visit Packet

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Summary

Now that you've seen the program you may be wondering what to do next. We're here to help. In the following pages we've provided some samples of vocabulary, possible questions and discussion topics as well as some activities that could be done in the classroom or at home. These are simply suggestions and we encourage you to modify this packet to suit your particular needs.

Concepts covered in show:

1. Night Sky

Light pollution is discussed as well as the current nighttime sky, including visible constellations and planets. The Milky Way is introduced as our galaxy and our solar systems placement in it is noted. A brief overview of the composition of our solar system is also provided

2. The Sun

Here the students learn that our sun is a star and discuss its properties with respect to size and energy output. The sun's effect on the Earth and some side effects of the sun's energy may be discussed, as well as the method of energy production in the sun.

3. The Moon

The Moon's physical characteristics are discussed in addition to the moon's apparent change in shape from night to night. The moon is the only other world ever visited by human beings and these missions are discussed along with recent discoveries.

4. Terrestrial planets

A discussion of the terrestrial planets: Mercury, Venus, Earth, and Mars. The planets are compared and contrasted with descriptions of each planet. This topic is concluded with a brief discussion of the asteroid belt and common misconceptions are revealed.

5. Jovian planet

A discussion of the Jovian worlds: Jupiter, Saturn, Uranus, and Neptune. The planets are compared and contrasted with descriptions of each planet. This section also includes a detailed discussion of some of the larger moons and ring systems that surround these giant planets.

6. Pluto and Beyond

Here the students learn about the last planet of our solar system as well as the co-inhabitants of the outer reaches of our solar system, comets. Finally an explanation of meteors and meteor showers is given.

Name _____

Date _____

Vocabulary

- 1. Polaris**

- 2. Constellation**

- 3. Milky Way**

- 4. Planet**

- 5. Moon**

- 6. Terrestrial World**

- 7. Jovian World**

- 8. Meteor**

- 9. Meteor shower**

- 10. Comet**

Vocabulary-Key

1. **Polaris**- sometimes called the North Star; marks the direction of North and lies directly over the North Pole.
2. **Constellation**- group of stars that seem to form a shape; sometimes human shapes or animals. 88 official constellations make up a map of the night sky.
3. **Milky Way**- the spiral galaxy in which we live.
4. **Planet**- A celestial body larger than an asteroid or comet, light is provided entirely from a star, like our sun, around which it revolves.
5. **Moon**-A natural satellite revolving around a planet
6. **Terrestrial Worlds**- literally means Earthlike; any of a small class of planetary bodies near the sun, with small rocky surfaces. (Mercury, Venus, Earth and Mars.)
7. **Jovian Worlds**- literally means Jupiter like; any of a class of large gas giant planets located far from the sun. Jupiter, Saturn, Uranus and Neptune.
8. **Meteor**- a meteoroid that has entered the earth's atmosphere. Commonly called a shooting star.
9. **Meteor shower**- Occurs when a large number of meteors appear together and seem to come from the same area of the sky.
10. **Comet**-a relatively small celestial body consisting of a frozen mass that travels around the sun in a highly elliptical orbit.

Name _____

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Short Answer and Discussion Questions

1. Can you see more stars out in the country or in the city? Why?
2. What are the nine planets? Give a brief description of each.
3. Where do meteor showers come from?
4. What is a constellation? Give an example.
5. Discuss the characteristics of Terrestrial versus Jovian worlds.

Short Answer and Discussion Questions - Key

1. Can you see more stars out in the country or in the city? Why?

You can see more stars in the country. That is because the extra lights of the city make it hard to see the dimmer stars. This effect is called light pollution.

2. What are the nine planets? Give a brief description of each.

The nine planets are: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. Descriptions will vary.

3. Where do meteor showers come from?

Meteor showers occur when the Earth passes through a stream of space-bourn dust. The source of this dust is a comet that leaves a trail of debris as it orbits the Sun.

4. What is a constellation? Give an example.

A constellation is a group of stars that together form a picture. There are 88 official constellations that make up a map of the sky. Examples will vary.

5. Discuss the characteristics of Terrestrial versus Jovian worlds.

Terrestrial planets are those closest to the sun. Mercury, Venus, Earth and Mars. They are all relatively small with hard rocky surfaces.

Jovian planets are farther from the sun. Jupiter, Saturn, Uranus and Neptune. They are gas giant planets with no solid surface and atmospheres composed primarily of Hydrogen and Helium.

Classroom Activity

Build a Comet

In this activity students will better understand the composition of a comet by making and inspecting a comet model.

You will need:

- Large bowl
- Wooden spoon
- Garbage bag
- 1 cup dirt
- 2 cups dry ice as fine as can be crushed
- 2 cups of water
- Eyedropper
- Can of coke
- Ammonia

What to do:

1. Explain that all the ingredients represent the actual composition and appearance of a comet and scaled down in proportion
2. Begin by placing the garbage bag into the bowl so that it acts as a liner.
3. Pour two cups of water in the bag.
4. Next pour in one cup of dirt and begin stirring.
5. Add a dash of ammonia (eyedropper).
6. Add a splash of coca cola (organic material)
7. Now for the fun part: pour in the 2 cups dry ice and stir until it gets the consistency of pudding. Timing is very important here. If you wait too long the mass will get lumpy.
8. Wrap the edges of the bag up around the mixture and squeeze into a nice ball.
9. When you unwrap this, you will have an excellent model of a comet.

Developed by: Dennis Shatz
Written by: Chuck Matlock, Jr.
UT-SPICA 1993

Classroom Display

Planet Pop Cans on Display

This display demonstrates the effects of a planet's size (mass) by showing how much a can of pop would weigh on each of the nine planets and the moon. A further explanation of the concept of gravity can be made using the pop cans as well. For example, the can of pop on Jupiter weighs the most because Jupiter has the strongest pull of gravity because Jupiter is the most massive planet.

You will need:

- 10 pop cans
- 5 pounds of paraffin wax
- 4 pounds of lead BBs (or something similar)
- Small sheet of poster board
- Contact paper and/or spray paint
- Scale

In order to make a set of display quality planet pop cans, the cans have to be relatively indestructible. We recommend BB's for weight and paraffin wax, which can be found in most craft stores, as a filler to make the cans squeeze proof. Please observe all safety precautions when dealing with hot wax and do not allow children to participate in the melting of the wax.

Here are the specifics of the cans for each planet:

Planet	Surface Gravity	Weight of Can (grams)
Mercury	0.38	148
Venus	0.91	354
Earth	1.00	390
Moon	0.16	62
Mars	0.39	152
Jupiter	2.74	1069
Saturn	1.17	456
Uranus	0.94	367
Neptune	1.15	449
Pluto	0.003	1

Decorating Tips: After filling the cans be sure to cover the tops with circular pieces of poster board. The display pop cans can be decorated in various ways. Contact Paper seems to work the best, as it does not chip like paint may. Label each of the pop cans with stick-on letters. Feel free to experiment with decorating methods.

Classroom Activity

Name That Planet

In this activity students will learn to identify the nine planets by learning the characteristics of each. This is a great review before a test, however it works best with the students having previously studied the solar system.

You will need:

- Index card
- Poster board (white)
- Markers
- Construction paper
- Crayons
- Scissors
- Pens and Pencils
- Glue
- Cotton

What to do:

1. Divide the students into groups (groups of 3 works best).
2. Give each group nine index cards.
3. Each group will work together to write up their own set of “Who Am I” cards using their textbooks or any other sources of information provided for them. (Remember that each index card represents one planet.)
4. Give each group nine (8 1/2 x 11) pieces of white poster board.
5. Students use their information on the planets to construct a diagram of each planet on their poster board.
6. Each group, one at a time, presents their activities. One student will hold up the planet diagram, while the other students take turns reading the matching planet description card to the rest of the class.
7. The rest of the class then tries to Name That Planet!
8. The game continues until every group has had a chance to give their presentation. For a shorter activity, limit the groups to a single planet.

More activities:

1. Have the students make matching sets of planet cards being sure to include things like rings. Use them to make a planet concentration game to set up at a learning station for the students to enjoy.
2. Play a word game using astronomical terms. Additional cards for objects like moons, asteroids, and comets can be made. Using the information cards students will try to guess the object using as few one-word clues as possible.

Example: Jupiter

One-word clues: planet, large, red, spot, gaseous, hurricane.

Developed by: Gina Hrinko and Jennifer Krohn
UT-SPICA 1993

Classroom Activity

Toilet Paper Model of the Solar System- a one act play

In this activity students will better understand the size and mechanics of our solar system by making a scale model out of toilet paper. Astronomers measure distances within our solar system by using a unit called an Astronomical Unit, or AU. One AU is equal to the average distance of the Earth from the Sun. In miles, this is 93,000,000 miles! Neptune is 30 times farther away from the Sun than the Earth is. So instead of saying it is 2,790,000,000 miles from the Sun, we say it is 30 AU. We can make a model of the distances between the planets by using a roll of toilet paper by pretending that one Astronomical Unit is equal to the length of 5 squares of TP.

You will need:

- Roll of toilet paper
- Markers
- A large space

What to do:

1. Assign each student a role (depending on class size they may have to take turns or work in groups.) You'll need someone to be the sun and the nine planets. For extra parts you can assign students to be various moons.
2. Roll out the toilet paper and give the students the TP model distance. Have them find their distance and mark their planet name in the appropriate spot on the toilet paper.
3. Once all of the students have found their proper place you have a good representation of the solar system size. To make it more realistic have the students revolve around the sun while making sounds to imitate their planets. If you're using moons, have the moons circle the planets while the planets circle the sun.

Here are the proper model distances:

Planet	Real distance from Sun (AU)	Model distance (Squares of TP)
Mercury	.38	1.9
Venus	.72	3.6
Earth	1.0	5
Mars	1.5	7.5
Jupiter	5.2	26
Saturn	9.5	47.5
Uranus	19.2	96
Neptune	30	150
Pluto	39.5	197.5

Name _____

Date _____

Recommended Astronomy Web Sites

After seeing a program you may be interested in finding out more about a particular subject. These are some of our favorite websites.

Misc

Ritter Planetarium-Brooks Observatory

Search for Extra-Terrestrial Intelligence Inst.

SETI@home

Space.com

Space Ref

Heavens Above (Satellite Tracking)

www.rpbo.utoledo.edu

www.seti.org

setiathome.ssl.berkeley.edu

www.space.com

www.spaceref.com

www.heavens-above.com

Education

Windows to the Universe

Bad Astronomy

The Nine Planets

windows.arc.nasa.gov

www.badastronomy.com

seds.lpl.arizona.edu/nineplanets/nineplanets

NASA

NASA Homepage

NASA Human Space Flight

NASA Jet Propulsion Laboratory

Space Telescope Science Institute (Hubble)

www.nasa.gov

www.spaceflight.nasa.gov

www.jpl.nasa.gov

www.stsci.edu

Telescopes

Meade

Celestron

Orion

Astromart

www.meade.com

www.celestron.com

www.telescope.com

www.astromart.com

Magazines

Sky and Telescope

Astronomy Magazine

www.skyandtelescope.com

www.astronomy.com

Societies and Organizations

International Dark-Sky Association

The Astronomical Society of the Pacific

International Astronomical Union

The Planetary society

www.darksky.org

www.aspsky.org

www.iau.org

planetarysociety.org