



The Sky

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 star pictures called constellations. The Milky Way is introduced as our galaxy and our solar system's place in it is pointed out.

- 2. Sun and Moon**

Here it is shown that our sun is a star and it is discussed why it seems so much bigger to us than any other star. The moon's orbit around the Earth is explained. Its age and physical description are given and a brief mention of lunar phases is made. The Apollo missions are introduced as well as they're significance.

- 3. Planets**

The two different types of planets are introduced; Terrestrial and Jovian. Brief descriptions and characteristics of each are given. Pluto is mentioned as not fitting in either category.

- 4. Comets**

The physical make-up of a comet is discussed. Its orbit around the sun and reason for its tail is given.

- 5. Stars**

The fact that all the stars we see in the sky are essentially the same as our sun. The different sizes and colors are explained and examples are given.

Name _____

Date _____

Vocabulary

- 1. North Star**

- 2. Constellation**

- 3. Milky Way**

- 4. Planet**

- 5. Moon**

- 6. Terrestrial World**

- 7. Jovian World**

- 8. Astronaut**

- 9. Comet**

- 10. Star**

Vocabulary-Key

1. **North Star**- sometimes called the Polaris; 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. **Astronaut**- person who trains to go into space. Some astronauts have landed on the moon or lived in a space station or even done repairs on satellites in space.
9. **Comet**- a relatively small celestial body consisting of a frozen mass that travels around the sun in a highly elliptical orbit.
10. **Star**- The tiny points of light seen in the night sky. Actually spheres of hot gas burning under their own power, giving off enormous amounts of energy.

Name _____

Date _____

Short Answer and Discussion Questions

1. Can you see more stars out in the country or in the city? Why?
2. What is a constellation? Give an example.
3. Discuss the characteristics of Terrestrial versus Jovian worlds.
4. What is a comet? Describe what one looks like.
5. Are blue stars hot or cold? What color is our sun?

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 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.

3. 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.

4. What is a comet? Describe what one looks like.

A celestial body, observed only in that part of its orbit that is relatively close to the sun. Comets are often described as dirty snowballs because they consist of a core of rock, dust, ice and snow. When they get close to the sun a long beautiful tail is also visible.

5. Are blue stars hot or cold? What color is our sun?

Blue stars are the hottest stars with temperatures around 50,000 degrees Fahrenheit. Red stars are the coolest at around 5000 degrees and our sun is a medium hot yellow star at about 10,000 degrees.

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

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

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.
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Classroom Activity

Birthday Moon

Students become familiar with lunar phases by locating and then drawing the Moon phase of their own birthdays. After listening and discussing lunar myths and legends they create their own Birthday Moon Stories. This activity is most effective after a lesson on the moon and its phases.

You will need:

- crayons, markers, or colored pencils
- access to the internet

What to do:

1. During the class, the teacher can go to one of the following sites:

<http://liftoff.msfc.nasa.gov/academy/universe/MOON.HTML>

<http://www.googol.com/moon/>

<http://tycho.usno.navy.mil/vphase.html>

Then, as each student gives his/her birthday, that date can be entered in, and the proper Moon picture generated. Each student then can record (by drawing) the Moon picture for his/her birthday. (If all students have internet access at home this step may be assigned as homework.)

2. Have the teacher read at least one moon myth to the students. Several are available at the following website:

<http://btc.montana.edu/ceres/html/birthdaymyths.htm>

(You may also choose other moon stories.)

3. Have the students observe the moon and make up their own moon myths that may explain things like the moon's coloring, shape or position in the sky. The students may either write them down or take turns telling them to the class.

Special Thanks to NASA/MSU-Bozeman CERES project for this activity.

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

www.rpbo.utoledo.edu

Search for Extra-Terrestrial Intelligence Inst.

www.seti.org

SETI@home

setiathome.ssl.berkeley.edu

Space.com

www.space.com

Space Ref

www.spaceref.com

Heavens Above (Satellite Tracking)

www.heavens-above.com

Education

Windows to the Universe

windows.arc.nasa.gov

Bad Astronomy

www.badastronomy.com

The Nine Planets

seds.lpl.arizona.edu/nineplanets/nineplanets

NASA

NASA Homepage

www.nasa.gov

NASA Human Space Flight

www.spaceflight.nasa.gov

NASA Jet Propulsion Laboratory

www.jpl.nasa.gov

Space Telescope Science Institute (Hubble)

www.stsci.edu

Telescopes

Meade

www.meade.com

Celestron

www.celestron.com

Orion

www.telescope.com

Astromart

www.astromart.com

Magazines

Sky and Telescope

www.skyandtelescope.com

Astronomy Magazine

www.astronomy.com

Societies and Organizations

International Dark-Sky Association

www.darksky.org

The Astronomical Society of the Pacific

www.aspsky.org

International Astronomical Union

www.iau.org

The Planetary society

planetarysociety.org