ABC's of the Sky
Teacher's Guide

ABC's of the Sky is a planetarium show designed for children from Kindergarten to Second Grade. The presentation explores the many wonders of the sky following the familiar path of the alphabet. A is for Astronaut, B is for Big Dipper, C is for Comet....and so on. Each concept is described in an age appropriate manner with many visuals.

This guide is made available to help you better prepare your students for their upcoming visit to Northern Stars Planetarium and the presentation *ABC's of the Sky*, when the planetarium visits your school. Because this presentation is available for a number of different grade levels, some activities in this guide may seem a bit old or a bit young for your students, depending on the age of your class. Please use just what you feel is appropriate for your group.

We hope you find this guide useful and fun; and, we hope you enjoy *ABC's of the Sky*.

ABC's of the Sky

Written by..... .....Laura Deines Meader
Music & Sound Production by.....Matt Barnard
Narration by.....Asch Gregory
Teacher's Guide by.....John T. Meader

A is for Astronaut.

Vocabulary

Astronaut A person who travels and works in space.

Big Dipper A constellation in the northern skies that resembles a cooking pot or a ladle. Constellations are like connect-the-dot pictures, using stars as dots.

Comet A comet is a dirty snowball orbiting the Sun. The Sun's energy melts the snow forming a long tail of gas and dust that always points away from the Sun.

Day The time it takes for the Earth to spin around or rotate on its axis one time.

Earth The planet that we live on. Earth is the third planet from the Sun.

Fireballs Pieces of rock that fall from space through Earth's atmosphere and burn up due to friction with the air. Sometimes Fireballs explode! Small rocks that do this are sometimes called *Shooting Stars* or *Meteors*.

Galaxy A huge group of stars. Galaxies often contain billions of stars. We live in a galaxy named *The Milky Way*.

Hubble Space Telescope A special telescope that orbits Earth up in space. Because it does not have to look through the air, it can see further into space than any previous telescope.

Io Io is a moon of Jupiter. It is about the same size as Earth's moon, but it has many active volcanoes, which gives it an orangish color.

Jupiter The largest planet in the Solar System. Jupiter is bigger than all the other planets put together. It is made of gases with no solid ground. It is the fifth planet from the Sun.

Kepler Johannes Kepler was an astronomer who lived 400 years ago. He was the first person to accurately determine how the planets move around the Sun.

Leo Leo the Lion is a bright constellation of the spring and early summer skies. It is one of 88 constellations in the sky.

Moon The Moon is Earth's closest neighbor in space. It orbits the Earth once every 29.5 days. Earth only has one moon, but some planets have many, such as Jupiter which has 63!

Nebula Clouds of gas floating in space. These clouds are made mostly of a gas called Hydrogen. These are often the regions where stars are forming. They come in many shapes and colors. Nebulae are very beautiful.

Vocabulary Continued:

Orbit An orbit is the path a planet follows as it moves around the Sun. Spacecraft like the Space Shuttle also travel in an orbit as they fly around the Earth.

Planet Planets are large objects that orbit around stars. The Sun has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.

Quasar Quasars are the brightest objects in the universe, but they are also among the most distant, so they are difficult to see in the real sky.

Rocket Rockets are machines that are very powerful. They are used to push spaceships and satellites into space.

Stars Stars are huge balls of hydrogen gas that shine with light and heat because of powerful nuclear explosions that continually explode in their centers. The Sun is the closest star. Other stars are just as big as the Sun, they only look small because they are very very far away.

Telescope A telescope is an instrument that makes distant objects appear closer and bigger.

Universe The universe is everything there is. It is made of all the planets, all the stars, all the galaxies, everything! Even you are part of the universe and so is everyone you know! The Universe is very VERY **BIG!**

Venus Venus is the second planet from the Sun. It is covered with clouds that are poisonous. It is very hot--900°F.

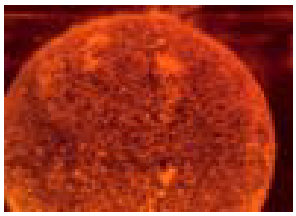
West West is one of the four main directions. The four main directions are North, East, South, and West. West is the direction where the Sun and stars set.

X-ray X-rays are a powerful form of invisible light. They can travel right through our bodies to let doctors see our bones. X-rays also let us know many things about stars and other objects in space.

Year A year is the length of time it takes Earth to travel in its *orbit* around the Sun.

Zodiac The zodiac is a set of twelve constellations that the sun seems to pass through in the course of one *year*. The constellations of the zodiac are: ***Aquarius*** the water bearer, ***Pisces*** the fish, ***Aries*** the ram, ***Taurus*** the bull, ***Gemini*** the twins, ***Cancer*** the crab, ***Leo*** the lion, ***Virgo*** the maiden, ***Libra*** the scales, ***Scorpius*** the scorpion, ***Sagittarius*** the archer, ***Capricornus*** the sea goat.

Sun & Planets Information



The Sun: The Sun is not a planet but a star. It seems bigger, brighter, and hotter than the stars we see at night only because it is closer to us. It is 93 million miles from Earth and has a surface temperature of 12,000°F! The highest temperature of all is in the Sun's core, 27 million °F ! Over one million Earth's could fit inside the Sun if it were hollow!

Mercury: Mercury is a gray planet covered with craters. It looks very much like the Moon and is only slightly larger. During the daytime the temperature will rise to 700°F, while at night it will drop to -150°F. Mercury has no moons.

Venus: Venus is covered with swirling clouds of acid. If you lived on Venus you would never have a sunny day. It is the hottest planet with a temperature of 900°F. There is so much air on Venus that the air's weight would squish you! Venus has no moons.

Earth: Earth is the only known planet to have life. From space it looks like a beautiful blue marble with white swirls; the blue is the oceans, the white swirls are the clouds, and the darker regions the land. Earth has one moon.

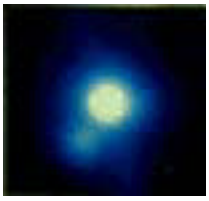
Mars: Mars is called the red planet. It is red because it is rusty. It has craters, mountains, canyons, volcanoes, and a thin atmosphere. Mars has two small moons.

Jupiter: Jupiter is the biggest planet. It has sideways cloud bands of different colors. Jupiter has no solid ground. There is also a huge red spot that is actually a hurricane three times bigger than Earth. Jupiter has 67 moons and one thin ring going around it.

Saturn: Saturn has light yellowish clouds. Like Jupiter, Saturn has no solid ground. Saturn is famous for its thousands of rings. It also has at least 62 moons. Many people think that Saturn is the most beautiful planet.

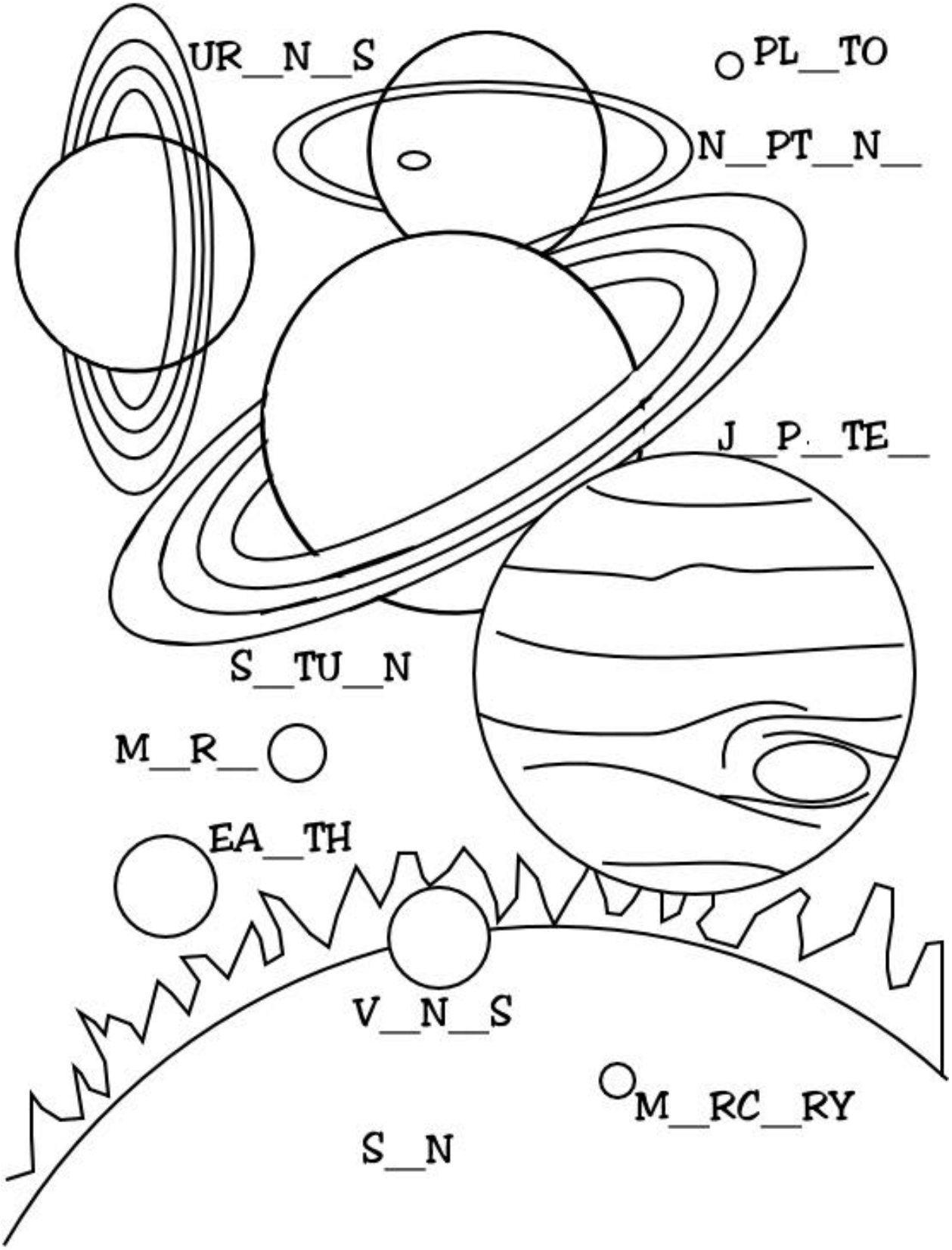
Uranus: Uranus is light blue in color and is tipped over sideways. It has no solid surface. It has about a dozen thin rings that go around the planet up and down (vertically). Uranus has 27 moons.

Neptune: Neptune is bluish in color, slightly darker than Uranus. It is just slightly smaller than Uranus. It has no solid surface. It has three brighter rings, and a couple of thin faint rings. It has 13 known moons.



Pluto: Pluto is no longer considered a planet. It is now called a "Dwarf Planet." It is made of ice and rock. It has 5 moons, one is nearly as big as Pluto.

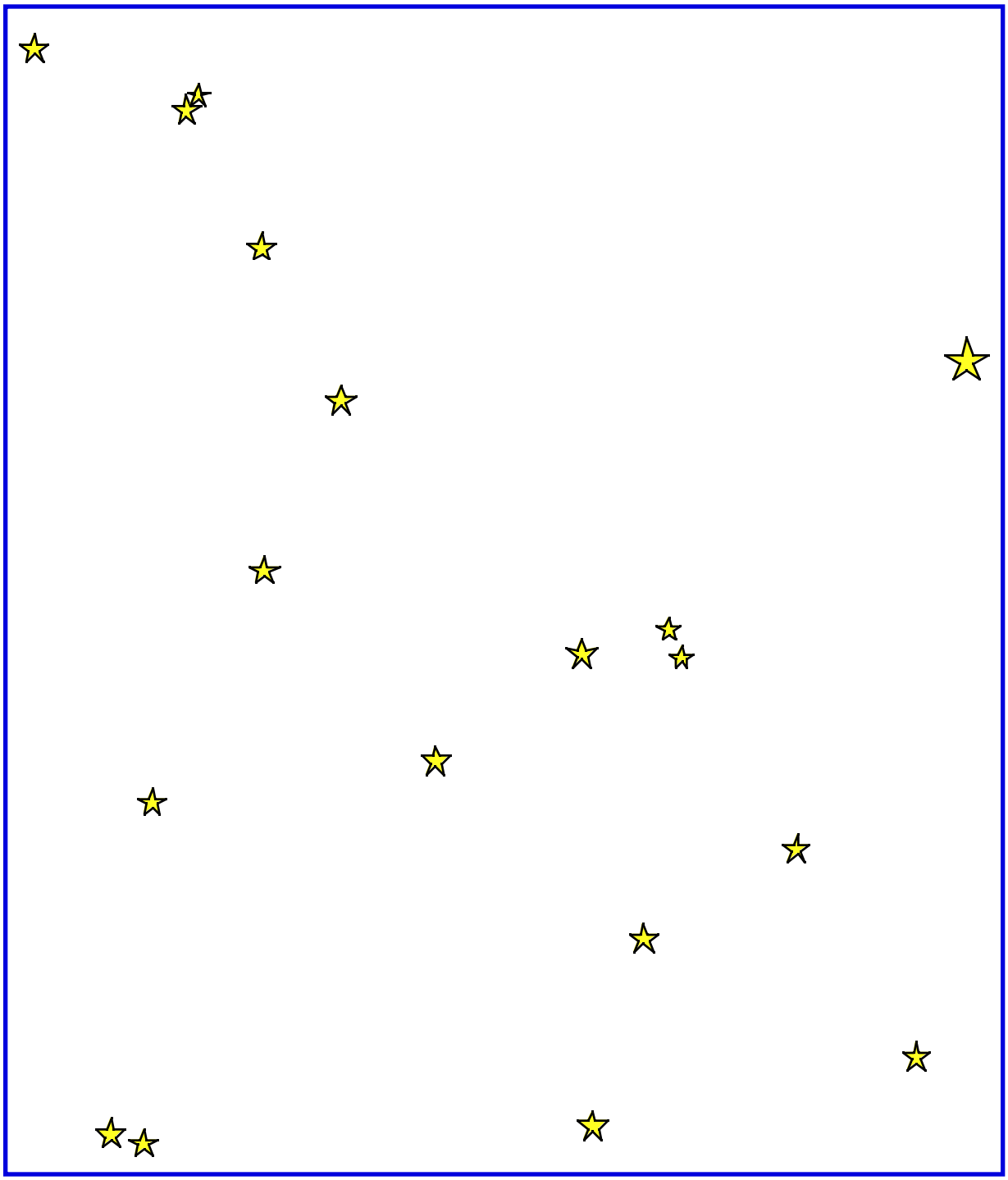
Color & Name the Planets



Create A Constellation Name_____

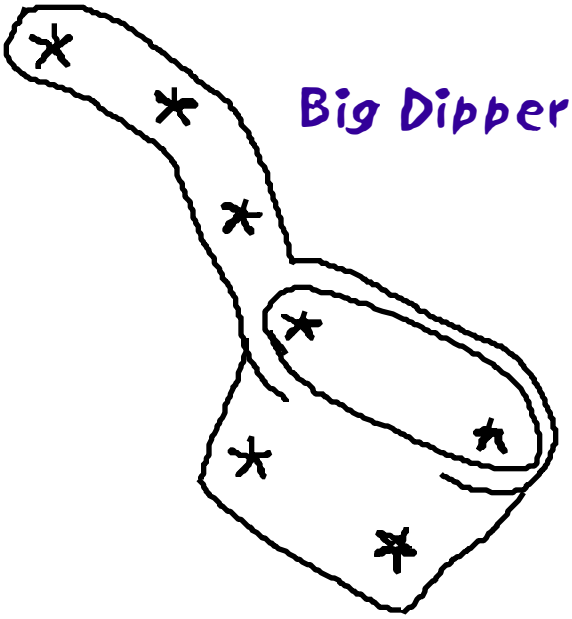
What do you see in the stars. Some people look at these stars and see a dipper, some people see a great bear, some people see a wagon, some a plough, and some a gourd. What picture do you see when you look at these stars?

Draw lines between the stars and make a picture of your own!



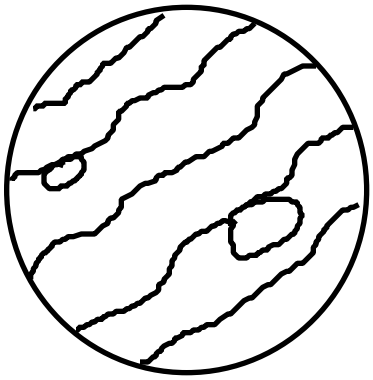
NIGHT SKY

Coloring Page



Big Dipper

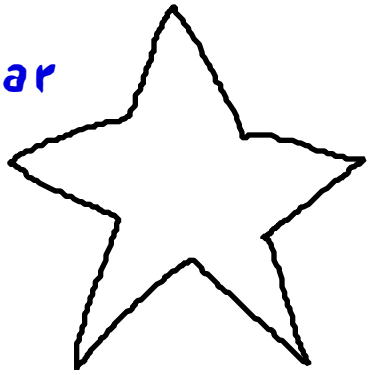
Moon



Jupiter

Comet

Star



Your Complete Address

An activity that will help you know where you are.

Please fill in the missing information. When you're done, turn the paper over and write your complete address on the back. With this address, anyone could find you!

Name:_____

School Room Number:_____

School:_____

School's Street Address:_____

Town:_____

County:_____

State:_____

Country:_____

Continent: (Circle one) Africa Antarctica Asia Australia
Europe North America South America

Hemisphere: (Circle one) Northern Hemisphere Southern Hemisphere
(Circle one) Eastern Hemisphere Western Hemisphere

Planet: (Circle one) Mercury Venus Earth Mars Jupiter
Saturn Uranus Neptune

Solar System (Circle one) Sun Pegasus 51 47 Ursa Majorus
(Yes we have found more solar systems!)

Galaxy (Circle one) Andromeda Milky Way Whirlpool
Sombrero Large Megallanic Cloud

ABC's Word Search Game

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

Find all the words from *"ABC's of the Sky"* hidden in the puzzle horizontally or vertically only:

ASTRONAUT BIG DIPPER COMET DAY EARTH FIREBALLS GALAXY HUBBLE SPACE TELESCOPE IO JUPITER KEPLER LEO MOON NEBULA ORBIT PLANET QUASAR ROCKET STARS TELESCOPE UNIVERSE VENUS WEST XRAY YEAR ZODIAC

Bonus words that are also hidden in the puzzle are found horizontally, vertically, and diagonally.

SUN NIGHT ABC SKY SPACE SHUTTLE CLOUD PLUTO MARS EAST SOUTH NORTH

Study Questions to Make You Think!

1. Name the **planets** in order from the Sun.

2. What are the four main directions?

3. Which direction does the Sun generally rise each morning?

4. Which direction does the Sun generally set each night?

5. How does a **telescope** help us learn more about space?

6. What is the difference between a **star** and a **planet**?

7. **Rockets** are used to push spacecraft into space. Name some famous spaceships?

8. A **galaxy** is a huge group of billions of stars. We live in a **galaxy**. Can you name our **galaxy**?

9. The Sun is a **star**. Why does it look bigger than all the other **stars**?

10. Which **planet** is the biggest?

11. Which **planet** is the hottest?

12. Which **planet** has life?

13. What is a constellation?

14. What is an **orbit**?

15. What do you call someone who goes into space?

16. How long does it take the **Earth** to travel around the Sun once?

17. Name five things found in the **universe**.

18. Can you name five constellations?

Answers to Study Questions on page 10:

1. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune. Pluto is no longer considered a planet.

2. North, East, South, West

3. East

4. West

5. The telescope helps us learn more about space by magnifying distant objects, making them look bigger and closer. It also makes faint object appear brighter.

6. A star shines by its own light. A planet reflects star light.

7. Space Shuttle (Enterprise, Columbia, Challenger, Discovery, Atlantis, Endeavor), Apollo Saturn V Moon Rockets, Skylab Space Station, Mir Space Station, Mercury, Gemini.

8. Milky Way

9. The Sun looks bigger than all the other stars because it is much closer than all the other stars. It is not really bigger.

10. Jupiter is the biggest planet.

11. Venus is the hottest planet with a surface temperature of 900° F.

12. Earth is the only planet that we know of to have life.

13. A constellation is a group of stars that form a connect-the-dot type of picture. There are 88 official constellations in the night sky.

14. An orbit is the path a planet follow around the Sun, or a moon follow around a planet, or a spaceship follows around the Earth.

15. Someone who travels in space is called an Astronaut.

16. It takes the Earth one year to travel around the Sun once.

17. The universe is everything there is, so anything you can name is part of the universe!

18. There are a total of 88 constellations. Some common ones named by children might be: Orion, Big Dipper, Little Dipper, Leo the Lion, Gemini the Twins, Taurus the Bull, Canis Major the big dog, Canis Minor the little dog, Draco the dragon, Cassiopeia the queen, Hercules the hero, Scorpius the scorpion, Aquila the eagle, Cygnus the swan, Pegasus the flying horse, and Andromeda the princess.

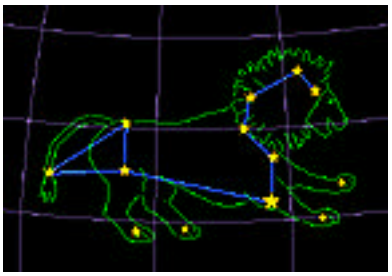
Name Game

Match the *ABC's of the Sky* word to the pictures below:

A _____

R _____

J _____



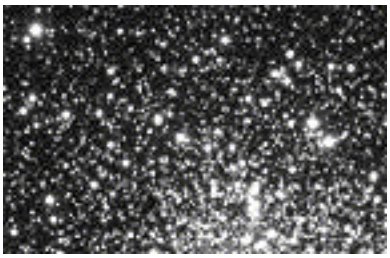
L _____

T _____

C _____

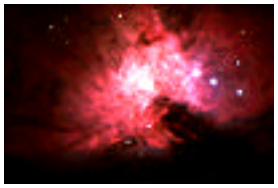
G _____

E _____



S _____

I _____



N _____

M _____

Pick from this list:

ASTRONAUT, BIG DIPPER, COMET, DAY, EARTH, FIREBALLS, GALAXY, HUBBLE SPACE TELESCOPE, IO, JUPITER, KEPLER, LEO, MOON, NEBULA, ORBIT, PLANETS, QUASAR, ROCKETS, STARS, TELESCOPE, UNIVERSE, VENUS, WEST, X-RAY, YEAR, ZODIAC

Write Your Own "ABC of the Sky" Book

The planetarium presentation "ABC's of the Sky" is similar to many ABC style children's books. Brainstorm with your kids to make a list of different space vocabulary to match each letter of the alphabet, then make your own ABC book, using the object for each letter that the class thinks is best. Here are *some* possibilities (the first in each list is the one used in the planetarium show):

A Astronaut Astronomy Asteroid Axis Arcturus Ares Aquarius Apollo Andromeda Albedo
B Big Dipper Black Hole Binary Star Big Bang Betelgeuse
C Comet Constellation Copernicus Cluster Ceres Cassiopeia Cassini Callisto Cape Canaveral Craters
D Day Dark Distance Dog Star Draco
E Earth Ellipse Eclipse Einstein Eros Evening Star
F Fireball Flares Fusion
G Galaxy Galileo Ganymede Gemini Globular Cluster Gravity
H Hubble Space Telescope Halley's Comet Hercules Horizon Hydrogen
I Io Iapetus Inner Planets
J Jupiter Jet Propulsion Laboratory
K Kepler Kuiper Belt Kennedy Space Center Kitt Peak Observatory Kohoutek Comet
L Leo Luminosity Lepus Large Magellanic Cloud Launch Lens Libra Light-year Light
M Moon Mars Mercury Magnetic Field Magellanic Clouds Magnify Maria Meteor Meteorite Meteor Shower Morning Star Moonrocks
N Nebula Night NASA Neptune Newton North Star
O Orbit Observatory Oort Cloud Olympus Mons Open Cluster Orion Orrery Outer Planets
P Planets Parsec Pegasus Perihelion Perseids Photon Pioneer Pisces Pluto Polaris Pulsar
Q Quasar Quaoar
R Rocket Red Giant Star Red Spot Rigel Rille Rotate Revolve Rings
S Stars Sun Saturn Sagittarius Satellite Space Shuttle Shooting Star Solar System
T Telescope Taurus Tycho Twinkle
U Universe Uranus Ursa Major
V Venus Vega Virgo Voyager
W West Weightless Wavelength
X X-Ray Xena
Y Year Yerkes Observatory
Z Zodiac Zenith

Bibliography

For Students (and grown-ups too!)

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---------- *The Sky is Full of Stars,* New York: Harper and Row, Harper Junior Books, 1981.

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For Teachers:

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Harrington & Pascuzzi, *Astronomy for All Ages, Discovering the Universe through Activities for Children and Adults,* Old Saybrook, CT: The Globe Pequot Press, 1994.

Mayo, Gretchen Will, *North American Indian Stories: Star Tales,* New York: Walker & Co., 1987. (Be sure to pre-read any stories before you read them to your class.)

Universe in the Classroom, Astronomical Society of the Pacific, Teacher's Newsletter, Dept. N. 390 Ashton Ave., San Francisco, CA 94112 (free to all teachers, request on school letterhead.)

Planetarium Program Evaluation

After the Northern Stars Planetarium has visited your class, please take a moment to fill out this evaluation. Your suggestions are very valuable to us!

Mail the completed evaluation to :.....Northern Stars Planetarium
15 Westerne Ave.
Fairfield, Maine 04937
Or Email To :.....info@northern-stars.com

1. Show Name: _____

2. Group grade/age level:_____

3. Was the material presented at an appropriate level for your class? _____

_____

4. Was the amount of material discussed: Enough Overwhelming Not Enough

5. Should any parts of the presentation be developed further? _____. If so, which parts?

6. Was there sufficient time for questions and answers? Yes No

7. Were you studying astronomy or another related subject at the time of the planetarium's visit?
Yes No
If so, was the planetarium visit helpful? _____

8. Was the Teacher's Guide helpful in preparing your class for the planetarium visit? Yes No
Which parts were most helpful? _____
Which parts were least helpful? _____

9. Did the presenter present the material in a clear and understandable fashion? _____

10. How would you rate the overall program given to your class in the planetarium? _____

_____

_____

11. (Optional) Your name & school:_____

Please feel free to write any *further comments* on the back.

Thank you for your time! Your Comments Make a Difference!