Wonders of the Universe

*By Carolyn Martin***Project One: Introducing the Solar System**

Objective: Define the solar system as the sun, the planets, and other things that go around it. State facts about the sun and each planet. Draw a map of the solar system.

Materials needed:  
•Visual aid such as a poster of the solar system, book with illustrations, or story book such as The Magic School Bus Lost in the Solar System or What Your First Grader Needs to Know•Poster board or large sheet of paper for each child  
•Black-line reproducible of planets (included on the Dock as well)

•Markers and crayons

1. Take your students on an imaginary trip through the solar system, using your visual aid or story book. Start at the sun and include the following facts. (For older students you will want to add more details.)

a. The sun is our source of energy, light, and heat.  
b. The sun is a star. More than a million earths could fit inside it.  
c. Mercury is the small planet closest to the sun.  
d. Venus is the second planet.  
e. Earth is our home and is just the right distance from the sun to give us the heat and light we need to live.  
f. Mars is the fourth planet, sometimes called the “red planet”.  
g. Jupiter is the fifth and largest planet. It has a large red spot that is probably a gigantic storm. Jupiter is a planet made of gas  
h. Saturn, the sixth planet is surrounded by rings. Saturn is another huge gas planet. Its thousands of rings are made of ice, rock, and dust orbiting around the planet.  
i. The next two planets are Uranus and Neptune. These large planets are made of gas.  
j. Pluto used to be called a planet. It is three and a half billion miles from the sun. Since it is so small it is no longer called a planet but a plutoid.

2. To make the map of the solar system:

a. Draw a quarter sun in the upper left-hand corner of a large paper or a poster board. Color yellow.  
b. Close to the sun, make a small circle (about ¼”) for Mercury. Color orange.  
c. Color and cut out planets from reproducible. Suggested coloring guide: Venus--yellow; Earth-blue; Mars-red; Jupiter-mix yellow, brown, and blue, color spot red; Saturn-yellow with orange rings; Uranus and Neptune-blue-green.  
d. Glue planets in diagonal across poster in progressive order from the sun.  
e. Draw a moon next to earth. You can draw moons for other planets that have them also. Draw Pluto in opposite corner from the sun.  
f. Add orbit rings, extending off the side of the paper for each planet.  
g. Other details such as the asteroid belt can be drawn in between Mars and Jupiter.

Enrichment Ideas:

1. Make a human model of the solar system. You need a large, clear area like a playground for this. One(or several) people are the sun. One student becomes Mercury and stands close to the sun. Another is Venus and is farther away. Have each of the other planets also represented by students. They stand an appropriate distance from the sun. At a given signal each of the planets walks (orbits) around the sun, keeping the same distance from the sun that they started with and all walking at about the same speed. This reinforces the idea of length of year and of an orbit.
2. Another solar system model idea: Use…
3. Extra-large ball like the kind you sit on and bounce (Sun)
4. 2 Marbles (Mercury and Pluto)
5. 3 Golf Balls (Venus, Earth, and Mars)
6. Beach ball (Jupiter)
7. Inflatable (kids) ball (Saturn)
8. Volleyball (Uranus)
9. Soccer Ball (Neptune)  
   With bright yellow yarn place the balls at the appropriate distance.  
   a. Mercury: 1/3 foot  
   b. Venus: 2/3 foot  
   c. Earth: 1 foot  
   d. Mars: 1 ½ feet  
   e. Jupiter: 5 feet  
   f. Saturn: 9 ½ feet  
   g. Uranus: 19 feet  
   h. Neptune: 30 feet  
   i. Pluto: 39 feet

3. Older students could do a research booklet about the sun and its planets.

4. Other areas to explore: the effect of gravity in space and on the various planets; why the Earth supports life; more details and facts about the sun.

**Project Two: The Earth in the Solar System**

*Objective*: *Define the terms: rotate (spin), orbit, sunrise, and sunset. Demonstrate how the earth orbits the sun to make a year and rotates to make a day.*

Materials needed:•Strong light source (such as a desk lamp) *•*A globe or a ball such as a basketball *•*A piece of clay

1. Use the globe or ball as a model of the earth. Make a small clay figure and stick it on the “earth”.
2. Use the light source as the sun. The sun does not move. It only looks like it does.
3. Shine the light on the figure on the “earth”. (This activity works best in a dark or dimly lit room.) Now the sun is shining on “you”. It is daytime where you live. Spin the “earth” slowly. Observe what happens. Observe what is happening on the other side of “earth” when you are in the day and when  
   you are in the night. It takes one day for the earth to rotate one time. The earth spinning around makes day and night. Demonstrate and define sunrise and sunset.
4. Now take the “earth” and walk around the sun. This is an orbit. It takes one year for the earth to orbit the sun. If you are coordinated enough spin the “earth” as you walk around.

Enrichment Ideas:

1. Read and enjoy the poem “Good Morning, Merry Sunshine”.
2. Fold a paper in half, book-style. On the outside draw and/or write about what you are doing right now. In the inside draw and/or write what someone on the other side of world is doing.

**Project Three: The Changing Moon**

*Objective*: *Define the term: phase.*

*Observe the various phases of the moon.*

*Describe the moon’s surface and list facts about the moon.*

Materials needed: *•*Poster or illustrations on the board showing the various moon phases *•*A rock *•*A mirror or other shiny object that will reflect light *•*Paper plate per student *•*Brad per student *•*Reproducible moon wheel from handout *•*Crayons

1. Discuss the following facts about the moon. Use the rock as an object lesson.

a. The moon has no air, no water, no life.  
b. The moon’s surface is dust and rock and marked with craters. Define craters.

c. The moon has less gravity than the earth so you weigh less. You could do record high jumps on the moon!  
d. The moon only reflects the light from the sun. It doesn’t have light of its own. (Use the mirror or shiny object to show how light reflects.)  
e. The moon travels (orbits) around the earth.  
f. We see only one side of the moon.

2. Using posters or illustrations drawn on the board discuss the changing shape of the moon. Some nights it is a big round ball. That is a full moon. Sometimes it is a half moon and sometimes it is a crescent (or banana) moon. These are called the phases of the moon. The moon seems to change shape because we can only see the part of the moon that is lit by the sun. Some nights we don’t see any moon. This is called the new moon.  
3. Make a model of the moon and its phases.

a. On the reproducible moon wheel color one circle yellow (at 12 o’clock) to represent the full moon; color the opposite circle black (at 6 o’clock) to represent the new moon. Make the 3 o’clock and 9 o’clock circles half black and half yellow to represent half-moon. At the 1:30 and 10:30 circles, draw a small crescent shape. Color the small shape black and the larger space  
yellow. At the 4:30 and 7:30 circles, draw a small crescent shape again but this time color the smaller space yellow and the larger shape black.  
b. Cut a circle the size of a nickel out of the paper plate. The circle should be placed about 3/8” from the edge of the inner circle part of the plate. This circle will be the moon. Draw a night scene on the paper plate.  
c. Attach the moon wheel to the paper plate with a brad to the center of the plate. Turn the wheel to see the various phases shining in the sky.

4. As a homework assignment have students observe the moon for several nights and report what they see.  
5. Optional: students may record their observations in a journal.

**Project Four: Pictures in the Sky**

*Objective: Define the term: constellation.*

*Describe a star.  
Observe the Big Dipper.*

Materials needed: *•*Black or dark blue construction paper, one sheet per student *•*Gold or silver self-stick stars (7 or 8 per student) *•*Yellow or white crayon or coloring pencil *•*Optional: star chart or poster

1. Discuss the following facts about stars.

1. A star is a large ball of burning gas.
2. Our sun is a star that is close to us.
3. Stars look so tiny because they are so far away.

2. Long ago people found “dot-to-dot” pictures in the sky made from the stars. These pictures are called constellations. Show some of these constellations on a star chart or poster.3. Discuss the Big Dipper. Draw the constellation on the board.4. Give each student a sheet of black or dark blue construction paper.5. Illustrate where each star should be. Have students make a dot in the proper place.6. Connect the dots with a white or yellow crayon or coloring pencil.7. At each of the dots place a gold or silver star.

Optional: show the placement of the North Star and place a star in that spot.

Homework: Students should find the Big Dipper in the night sky. They will probably need adult helpwith this.