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La Tierra en el Sistema Solar / Earth in the Solar System

Curriculum Unit 08.05.05
by Christine Jones

Introduction

This unit will be a study of our solar system and how we fit in. The main goal of this unit is to help students understand our place in space by comparing Earth to the other planets in a variety of ways. Students will learn characteristics of each of the planets, including earth, in order compare other planets to ours. They will look at the placement and order of the planets, as well as their distances from the sun. Students will look at relative sizes of planets, in order to compare them. Students will learn about rotation and revolution. They will also study the characteristics of each planet individually. The unit will culminate with a comparison of Earth to another planet. In this way, students will understand how Earth is similar and how it is unique to other planets in our solar system.

This unit has been designed for students in a dual-language school. Students in dual-language school receive instruction for all curricular areas in two languages, ours being Spanish and English. This unit will be taught in Spanish to a mixed group of students; that is, students who are native Spanish speakers, as well as students who have had little to no Spanish background before entering the program in Kindergarten. Because of this mix of language skills, special considerations and modifications are necessary. There will be intensive vocabulary building and reinforcement and use of pictures and visuals to teach and demonstrate concepts and vocabulary. A table of important vocabulary, both scientific and everyday, has been included in each lesson for this purpose. It can be used in regular education classrooms, as well, and is highly adaptable for English Language Learners (ELLs).

Overview of Unit and Strategies

Students will first learn that we are part of a solar system that contains 8 planets that revolve around the sun. They will learn the position of these planets and their distance from the sun. Concepts that involve large amounts are very difficult for children in 1 st grade. In order to better facilitate understanding of the actual distances of the planets from the sun and from each other several demonstrations will be employed. One demonstration would be to bring children out on a field or playground and have 8 students represent each of the eight planets. The students would be placed at relative distances from each other to demonstrate the distance between the planets.

Students will then learn the sizes of the planets. Earth is quite large, especially from the perspective of a young child. To understand and grasp that Earth is one of the smaller planets would be challenging for children at this grade level. To facilitate understanding, demonstrations will again be used. Large two-dimensional models would be created demonstrating the relative size of all the planets, in order to compare them to each other. A model of the sun would also be made to show the great size difference between the planets and stars.

After learning about the sizes and distances of the planets, students will then study the motion of the planets. They will learn that all the planets move, or rotate, around the sun. Students will again be taken outside for a demonstration. A pole or some object will be used as a center to represent the sun. String will be used to measure how far each planet is from the sun, using prior calculations. Each student will take a string and rotate around the “sun” in order to better understand the motion of the planets.

Students will also learn about revolution. They will learn that as the planets rotate around the sun, they also turn. They will discover that this is what makes day and night. Demonstrations will be used both in the classroom and outside to demonstrate revolution. To show day and night, 1 student will be used to represent the sun and another will represent earth. “Earth” will slowly spin and stop while facing the sun. Students will discuss what that means and discover that the part of the earth facing the sun is experiencing light and therefore, day. The student “Earth” will continue to spin, facing away from the sun. Students will then discuss how the part of the earth facing away from the sun is experiencing dark and therefore, night. The class will return outside and the students will again rotate around the sun, adding the motion of revolution to complete their understanding of how the planets move.

Students will then do a short study on each planet in our solar system to learn major and interesting facts about each one. Students will be read to and discuss one planet a day and discuss the similarities and differences among planets. Students will compile a Planets book, which contains important and interesting information about each planet.

To finish off the unit, students will select a planet to compare with Earth. The teacher will demonstrate first using a venn diagram to write a short paragraph. Students will plan which planet they would like to compare to Earth, complete the venn diagram, and then write a short paragraph that compares another planet to earth. Students should incorporate the information learned throughout the unit to compile the written paper. For this part of the unit, students will work in pairs. A native language Spanish speaker will be paired with a non-native Spanish speaker. In this way the pairs can collaborate and help each other learn facts about their planets and complete the writing. Because of the nature of my classroom, it is imperative that students be paired, but it is not necessary for the completion of the unit.

Students will share and display comparisons at the culmination of the unit.

Background

The Solar System

The solar system is comprised of planets that orbit around a star. Our solar system consists of eight planets and three dwarf planets that orbit around the sun. The order of the planets is as follows: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. The dwarf planets are Ceres, Pluto and Eris. The first four planets are known as the terrestrial planets because they are made of solid, rocky material. They are dense, have few or no moons, no rings, and are composed of minerals with high melting points. The last four planets are known as the gas giants because they are much larger and comprised of gases.

> Unlike rocky planets, which have a clearly defined surface, gas giants do not; their atmospheres simply become gradually denser toward the core, perhaps with liquid or liquid-like states in between [1].

These planets also have many satellites and rings. The planets orbit around the sun in an elliptical, or oval, shape, of which the sun is one of the foci.

Figure 1: The Terrestrial Planets: Mercury, Venus, Earth, and Mars (1)

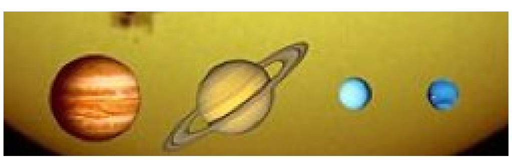

Figure 2: The Gas Giants: Jupiter, Saturn, Uranus, and Neptune (1)

The sun is the star that is central in our solar system and is classified as a large yellow dwarf. This classification is based on its brightness and surface temperature. It is believed that the sun has not yet exhausted its store of hydrogen and therefore still has many years left to give heat to our solar system [2].

The Planets

Mercury

Mercury is the smallest planet, located closest to the sun. It is 4,878 km in diameter and is 57,900,000 km from the sun. It takes 1392 hours for Mercury to complete one rotation and 88 days for it to travel completely around the sun. The surface temperature varies greatly due to Mercury’s extra thin atmosphere and complex orbit. It can reach 350 degrees Celsius during the day and get as cold as -170 degrees Celsius at night. Mercury has no satellites.

Mercury's surface is a grayish color and consists of many craters and cracks. It does have an area of plains that may have been an ancient area of volcanic activity [3].

Figure 3: Mercury (1)

Figure 4: Terrain of Mercury (1)

It was thought for a while that Mercury had no atmosphere, but it has been discovered that Mercury does have an atmosphere, though extremely thin [4]. This atmosphere is unstable, consisting of atoms being constantly lost and replaced by various sources such as solar winds and radioactive decay. It contains hydrogen, helium, oxygen, sodium, calcium and potassium.

Mercury's orbit is the most eccentric of all the planets, meaning that its orbit is off center. Its apoapsis distance, or farthest point from the sun, is 70,000,000, while its periapsis distance, or closest point to the sun, is 46,000,000. This is the cause of Mercury's highly varied temperatures. Mercury's speed of orbit is not constant; it moves faster when it is closer to the sun and slower when it is further away. Figure 5 shows Mercury's orbit in yellow and orange on top of a circular obit with the same semi-major axis. The image demonstrates the eccentricity of Mercury's Orbit.

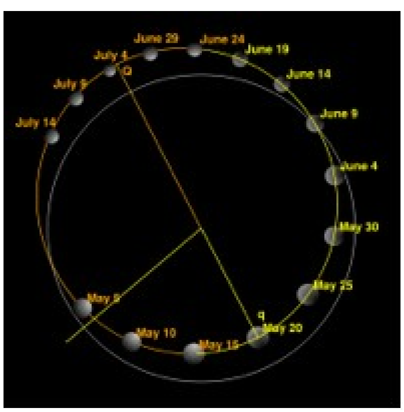

Figure 5: Elliptical Orbit of Mercury (1)

Comparatively less is known about Mercury than other planets because of its close location to the sun. NASA recently launched a mission to Mercury called MESSENGER that left on August 3, 2004 and completed a fly-by of Mercury on January 14, 2008. Two more fly-bys are scheduled in the coming years and in 2011 a probe will be launched into Mercury's orbit to learn more about this little planet.

Venus

Venus is the second planet from the sun and is part of the group of terrestrial planets. It is 108,000,000 km from the sun and is 12,102 km in diameter. It takes 5,832 hours or 243 days to complete one rotation but rotates in a retrograde motion, opposite that of other planets. It takes 225 days to revolve around the sun. Although, Venus' orbit is elliptical, like all planets, it is the closest to being circular. The surface temperature is hotter and more stable than that of Mercury, ranging from 400 to 700 degrees Celsius. Venus has no satellites.

Image 6: Venus (1)

The surface of Venus is very dry and rocky with few craters. It consists of mostly rolling plains formed from volcanic activity. It has very dense atmosphere made up of mostly carbon dioxide. There are many layers of thick clouds that consist of sulfuric acid. Lightening storms are common at this level. The atmospheric pressure at the surface is over 90 times of that on earth, but it is calm, as there is little wind. The surface of Venus has been volcanically active, though no evidence of lava flow has been found [5].

Earth

Earth is the third planet from the sun and the only known planet that contains liquid water or life. It is 149,600,000 km from the sun and 12,756 km in diameter, the largest of the terrestrial planets. It rotates in 24 hours and takes 365 days to revolve around the sun. The temperature ranges from -90 to 60 degrees Celsius. It has one satellite, called the moon. From space it has appears blue and white due to the oceans and clouds.

The surface of earth is made up of about 70% water and 30% landmasses. Its surface is divided into sections called tectonic plates that move and shift, causing earthquakes and volcanoes. The atmosphere is made up by mostly nitrogen and oxygen. The atmosphere is made up of four levels or sections that have no definitive boundary, but simply gets thinner and thinner before fading slowly into space. The atmosphere of earth includes some clouds, but there are far fewer than in the densely covered atmosphere of Venus. Earth is the only known planet in the solar system with living organisms.

Figure 7: Earth (1)

Figure 8: The moon (1)

Earth’s satellite, the moon, orbits around the earth about every 27 days. The moon has a diameter of 3,475 km, about one-quarter of that of the earth. The moon affects many parts of Earth. The most obvious is that the moon causes tides in the oceans. It is thought that the reason that Earth tilts only so far and not further, is due to tidal interactions with the moon [6]. This prevents a rotation that would approach the plane of the ecliptic, where the axis would be horizontal, with one pole directly facing the sun and the other directly away from it. This kind of scenario would result in extreme heat at one pole and extreme cold at the other. The moon, however, stabilizes the axial tilt.

Mars

Mars, the fourth planet from the sun, is the last terrestrial planet. It is 228,000,000 km from the sun and its diameter is 6,786 km. It has a reddish color due to oxidized iron minerals, or rust, on its surface.

Figures 9 and 10: Mars (1)

It has a rotation practically equal to earth, at 24.5 hours long, but its orbital revolution is practically double at 1.88 years or 686 days long. The surface temperature ranges from -140 to 20 degrees Celsius. Mars has two satellites, Phobos and Deimos, named after characters in Greek mythology.

Figure 11:
Olympus Mons (1)

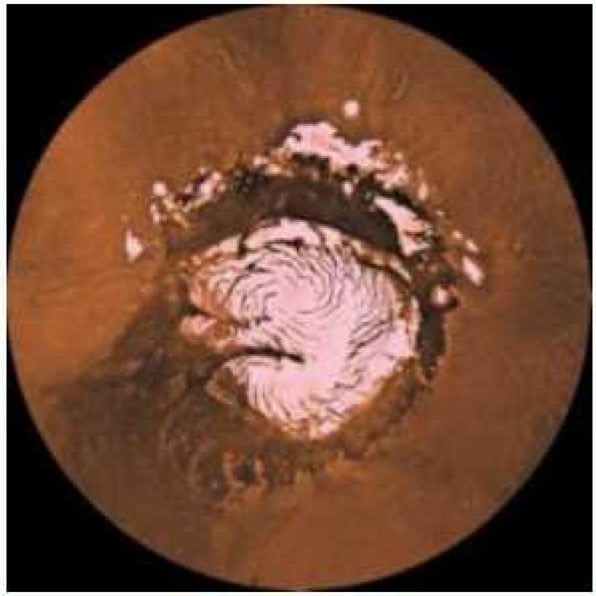

Figure 12: Northern ice cap- Mars (1)

The surface of Mars is comprised of many dry and rocky plains dotted with mountains and craters. The largest known mountain in the Solar System, Olympus Mons, is found on the surface of Mars and can be viewed in Figure 11. There are large areas of ice in the poles that consist mostly of water ice, but some dry ice (frozen carbon dioxide) is present, as well. The northern ice cap of Mars is shown below in Figure 12. Mars has a thin atmosphere made up of mostly carbon dioxide, with little nitrogen and argon. It also contains traces of water and oxygen. This thin atmosphere accounts for the large variation of temperatures on the surface [7]. Mars also experiences large dust storms, which can cover the entire planet.

Jupiter

Jupiter, the first of the gas giants, is 778,000,000 km away from the sun, more than three times as far as Mars. It is the largest planet in our solar system, with a diameter of 142,980 km. Jupiter's mass is more than two and a half times more than that of all the remaining planets combined. It completes one rotation in about 10 hours, though the atmosphere at the equator rotates faster than at the poles [8]. It takes 4,343.5 days or 11.9 earth years to revolve around the sun. The temperature on Jupiter averages -110 degrees Celsius. Jupiter has at least 63 satellites, four of which, known as the Galilean moons, are quite large [9].

Figure 13: Jupiter (1)

Figure 14: Galilean Moons (1)

Jupiter appears to be an assortment of different browns, tans, reds, and yellows. The atmosphere is separated into sections, or bands, that rotate in different directions around the planet. The lighter bands are called *zones* , while the darker bands are labeled *belts* . These winds cause storms and turbulence within the atmosphere. Jupiter is famous for its "Great Red Spot", which is thought to be a huge storm, larger than the diameter of Earth. The clouds of Jupiter's atmosphere are made up of ammonia crystals and possibly ammonium hydrosulfide [10] .

Figure 15: The Great Red Spot (1)

Jupiter, like all of the gas giants, has a ring system, and it is divided into three sections. The rings are probably made out of dust and particles, not ice, like those of Saturn. The first layer is called the inner torus (halo). The second is the main ring and is very bright. The final ring is known as the outer gossamer ring. The rings of Jupiter are very broad, but very thin.

Saturn

Twice as far out as Jupiter, sits Saturn, the planet known for its rings. This planet is located 1,430,000,000 km away from the sun and has a diameter of 120,540. Saturn is the least dense planet; it is even less dense than water. It completes one rotation in 10.5 hours, though different parts of its atmosphere rotate at different rates, just as on Jupiter. It takes 29.5 years or 10,759 days for Saturn to orbit around the sun. The average temperature on Saturn is -180 degrees Celsius. At least 60 satellites have been discovered orbiting Saturn, including one named Titan that is larger than Mars [11] !

Figure 16: Saturn (1)

From space, Saturn appears to be various shades of yellow and brown, and is also divided into bands as Jupiter. Saturn experiences storms similar to Jupiter that are caused by the turbulence between the bands moving in opposing directions. Saturn experiences very high winds that can reach up to 1,800 km/hr. The upper layer of clouds in the atmosphere is composed of ammonia crystals and the lower is composed of ammonium hydrosulfide or water [12] . The poles are made up of water ice.

The rings of Saturn are quite expansive; they have a diameter of 270,00 km, but are only a few meters thick. They are comprised of mostly ice particles with small amounts of debris and dust. The rings are separated into different sections.

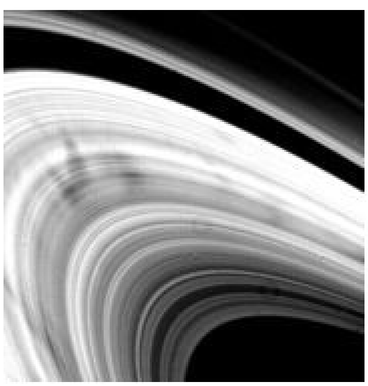

Figure 17: Saturn's Rings (1)

Uranus

Uranus is located 2,870,000,000 km away from the sun; twice the distance of Saturn. Its diameter measures 51,118 km across. It revolves in 17.2 hours and orbits around the sun in 30,660 days or 84 years. The temperature on Uranus is -216 degress Celsius. Uranus was the first planet to be discovered in modern times by use of a telescope. It was viewed by Sir William Herschel in 1871. It is known to have 27 satellites in its orbit [13] .

Figure 18: Uranus (1)

Figure 19: Uranus and its rings (1)

Uranus appears a greenish-blue color due to the scattering of blue light and the absorption of red light by methane gas [14]. Uranus is composed of hydrogen and helium, like Saturn and Jupiter, but it contains a much higher proportion of ices (water, ammonia and methane). For this reason, Uranus, along with Neptune, is sometimes referred to as an ice giant [15].

Uranus, unlike any other planet in our solar system, has an extreme tilt to its axis. The axis tilts as much as 98 degrees causing its poles to point directly at the sun. One pole will experience 42 years of sun and then proceed to experience 42 years of darkness. The satellites also follow this tilt and orbit around Uranus in a vertical manner. Uranus also spins in a retrograde manner, as does Venus.

The rings of Uranus are narrow and faint, only about ten meters in diameter. There are believed to be 13; the inner rings are grey, while the outermost ring is blue and the next outermost is red.

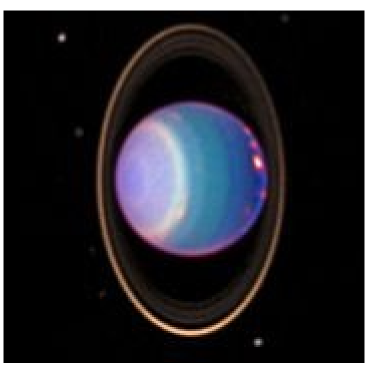

Figure 20: Uranus2 (1)

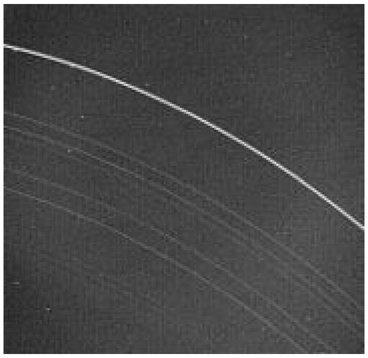

Figure 21: Uranus’s rings (1)

Neptune

The last planet in our solar system, Neptune, is located 4,500,000,000 km from the sun. It is 49,528 km in diameter and takes 60,225 days or 165 years to travel around the sun. Neptune’s differential rotation is the most pronounced out of all the planets [16] . The atmosphere around the equator rotates in about 18 hours while the polar regions complete a rotation in only 12 hours. These are both different from the rotation of the magnetic field, which rotates in about 16 hours. The temperature on Neptune is -216 degrees Celsius, which is similar to the temperature on Uranus. The temperature is very similar because Neptune itself emits much energy and is able to heat itself, whereas Uranus does not radiate nearly as much energy as Neptune [17] . Neptune has 13 known satellites.

Neptune, as Uranus, can be known as an ice giant because it is composed of larger amounts of volatiles, or ices, such as methane and ammonia. Its atmosphere has bands, as do the other giants and Neptune experiences the strongest winds of any planet at 2,100 km/hr. Neptune has rings but they are few, thin, and unstable [18] .

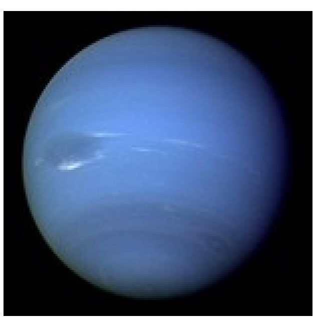

Figure 22: Neptune (1)

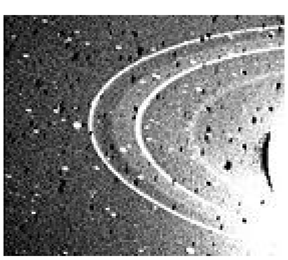

Figure 23: Neptune’s Ring System (1)

Lessons

In the first week of this unit, students will be introduced to the solar system and the relative sizes and locations of the planets. They will discover, through experiments and demonstrations the structure of the solar system. The second week is dedicated to studying each planet a little more closely. Students will learn facts and interesting features about each planet. The third and final week contains the culminating project, the overall objective of the entire unit. In the last week, the students will compare earth to another planet. They will study another planet in greater detail and discover in what ways it is similar and in what ways it is distinct from Earth. In this way, each student will walk away with a better understanding of how we, on Earth, connect with the rest of the solar system.

Week 1

Day 1: Introduction to the solar system

To be introduced to our solar system, the teacher will use several big books to give information and show images about the solar system. Students will name and spell all the planets in order. Students will then fill in a blackline of the solar system, labeling each planet.

Table 1: Important Vocabulary

Planeta-planet
Sistema solar- solar system
Sol-sun
Esfera-sphere
Mercurio- Mercury
Venus- Venus
La tierra-Earth
Marte- Mars
Júpiter-Jupiter
Saturno-Saturn
Uranio-Uranus
Neptuno-Neptune

Day 2: Structure of the solar system: Planets distances from the Sun

The teacher will have a large pre-made picture model of the solar system that shows the correct relative distances of all the planets from the sun (sizes of planets may not be to scale). As a whole class, students and teacher will use a ruler to measure the distance of each planet from the sun in centimeters or millimeters. This information will be written on a chart and analyzed after all distances have been measured. Students will be asked which planets are close together and which are very far apart. Students will be asked if earth is far from the sun compared to the other planets.

After analyzing the data, the whole class will go outside to create a larger model of the planets distances from the sun. There will be 8 pre-cut pieces of string (probably larger than the paper model by a power of 10) that will each represent the distance of one planet from the sun. Student volunteers will use the strings to position themselves on the field to represent the planets. This exercise will give the students the understanding of just how far some planets are from the sun and how much distance there is between planets.

Table 2: Important Vocabulary

Distancia-distance
Centímetros-centimeters
Milímetro-millimeters
Lejos-far
Cerca-close
A qué distancia-how far
Cuánta distancia hay-how much distance is there

Day 3: Planet sizes

On the third day of the unit, students will compare the sizes of the planets. The teacher will have cut out circles made to scale to represent the planets. The circles will be white without writing. Students will use what they already know to try to guess which circle represents which planet. After naming the planets, the class and teacher will measure each planet and write the data on chart paper. After measuring all the “planets”, the class will analyze the data to compare the other planets to earth.

Students will then work in pairs to guess how many planet earths will fit into the larger planets (Neptune, Saturn, Uranus and Jupiter). The class will then make/cut out many circles to represent earth and place them inside each planet to find out how many earths fit inside these planets. The class will then review the predictions made beforehand. This lesson is intended to facilitate understanding of the immense size of the planets, as well as the difference in size among planets.

Table 3: Important Vocabulary

Tama–o-size
Cuántos-how many
Caben-fit
Dentro-inside
Peque–o-small
Mediano-medium
Grande-big
Gigante-huge

Day 4: The orbits of the planets

On this day, students will revisit the paper model of the solar system, previously used on day 1. The teacher will present the information using the paper as a model that the planets orbit around the sun in an elliptical, which is like the shape of an oval. The class will then go out to the field and use the strings from day 2 to imitate the planets' orbits around the sun.

Table 4: Important Vocabulary

Girar-revolve

Orbitar-orbit
Elíptico-elliptical
”valo-oval
Alrededor-around

Day 5: Orbit and rotation

In order to compare the length of time on other planets to that of Earth, the class will create a chart that displays how many days comprise a year and how many hours comprise a day for each planet.

The class will then use a website to calculate their ages on other planets. The following are several possible options.

http://www.exploratorium.edu/ronh/age/index.html

http://www.solarviews.com/eng/edu/age.htm

http://www.schoolsobservatory.org.uk/astro/solsys/age.shtml

http://mistupid.com/astronomy/ageonplanets.htm

http://www.geody.com/spaceage.php

http://www.morebirthdays.com/

Table 5: Important vocabulary

Cumplea–os-birthday
A–o-year
Día-day
Horas-hours
Tiempo-time

Week 2: Study of Individual Planets

During the second week, students will learn several facts and characteristics about each planet. The teacher will read non-fiction literature, present facts and show photographs to students for each planet. The class will then write what they learned on chart paper. At the end of the week, there should be a chart for each planet. After completing a class chart, students will individually or in pairs write one to three facts they learn about each planet.

Week 3: Individual Planet Study and Comparison to Earth

During the final week of this unit, students will work in pairs to compare another planet in the solar system to earth. Groups will first study and review their chosen planet and complete a question worksheet on both earth and the chosen planet. They will then transfer this information to a venn diagram. After completing the venn diagram the group will write a paragraph using the venn diagram as a guide. They will then add photos and illustrations to their paragraph.

This part of the unit will be done independently, with help from the teacher as necessary per group. The teacher will act as a guide to answer questions, provide suggestions, and check work.

As a finale and culmination of the unit, students will participate in a celebration and sharing on the last day. Pairs will share their completed projects with the whole class.

Table 7: Important Vocabulary

Similar-similar
Igual-equal
Diferente-different

Notes

1. Wikipedia, *Gas giant* , http://en.wikipedia.org/wiki/Ice_giant (accessed May 25, 2008).

2. Wikipedia, *Sun* , http://en.wikipedia.org/wiki/Sun (accessed May 24, 2008).
3. W. K. Hartmann, *Moons & Planets,* 18.
4. Wikipedia, http://en.wikipedia.org/wiki/Mercury_%28planet%29 (accessed May 24, 2008).
5. Wikipedia, http://en.wikipedia.org/wiki/Venus (accessed May 24, 2008).
6. Wikipedia, “Moon” in *Earth* , http://en.wikipedia.org/wiki/Earth#Moon (accessed May 24, 2008).
7. Wikipedia, “Atmosphere” in *Mars* , http://en.wikipedia.org/wiki/Mars#Atmosphere (accessed on May 24, 2008).
8. W. K. Hartmann, *Moons & Planets* , 32.
9. Wikipedia, *Moons of Jupiter* , http://en.wikipedia.org/wiki/Moons_of_Jupiter (accessed on May 25, 2008).
10. Wikipedia, *Cloud pattern on Jupiter* , http://en.wikipedia.org/wiki/Cloud_pattern_on_Jupiter (accessed on May 25, 2008).
11. Wikipedia, *Moons of Saturn* , http://en.wikipedia.org/wiki/Moons_of_Saturn (accessed on May 25, 2008).
12. Wikipedia, “Cloud Layers” in *Saturn* , http://en.wikipedia.org/wiki/Saturn#Cloud_layers (accessed on May 25, 2008).
13. Wikipedia, *Moons of Uranus* , http://en.wikipedia.org/wiki/Moons_of_Uranus (accessed on May 25, 2008).
14. W. K. Hartmann, *Moons & Planets* , 45.
15. Wikipedia, *Uranus* , http://en.wikipedia.org/wiki/Uranus (accessed May 25, 2008).
16. Wikipedia, “Orbit and Rotation” in *Neptune* , http://en.wikipedia.org/wiki/Neptune#Orbit_and_rotation (accessed May 25, 2008).
17. Wikipedia, “Internal Heat” in *Neptune* , http://en.wikipedia.org/wiki/Neptune#Internal_heat (accessed May 25, 2008).
18. Wikipedia, “Planetary Rings” in *Neptune,* http://en.wikipedia.org/wiki/Neptune#Planetary_rings (accessed May 25, 2008).

Sources for Educators' Background

www.wikipedia.org A comprehensive and extensive online encyclopedia, with up-to-date, current information and images. Easy to read and understand; provides excellent explanations of scientific and mathematical terms.

Emiliani, C. *The Scientific Companion: Exploring the Physical World with Facts, Figures and Formulas* . New York: Wiley Popular Science, 1995. Technical description of the formation of the universe and mathematical discussion of the planets; see chapters 7 and 8.

Hartmann, W. K. *Moons and Planets: Third Edition* . Belmont, CA: Wadsworth Publishing Company, 1993. Comprehensive book about planets and their formation.

Tola, Jose. *Atlas Basico de Astronomia* . Barcelona, Spain: Parramon, 2005. Atlas of astronomy in Spanish with basic explanations and color images. Could be read to the class.

Sources for the Classroom

1. Haslam, A. *Make it Work: Universe* . New York: Thomson Learning, 1995.

2. Jaeggi, C. *Los planetas* . Rand McNally & Company, 1995.

3. *Jovenes Cientificos: Technologia del Espacio* . Chicago: World Book International, 1995.

4. Walker, C. *Nuestro sistema solar* . Cleveland, OH: Modern Curriculum Press, 1993.

Implementing District Standards

Standard 1.4: The properties of materials and organisms can be described more accurately through the use of standard measuring units. Various tools can be used to measure, describe and compare objects and organisms.

In this unit, students will be measuring the relative sizes and distances of all the planets. They will participate in several activities that will facilitate the understanding of the immense size of the solar system and each planet. It is through measuring the distances and sizes of the planets that students will create a better understanding of our solar system as a whole and the place of earth within.

Scientific Inquiry Standard A INQ.5: Seek information in books, magazines, and pictures. In this unit students will be learning facts about each planet through books and pictures.

Scientific Inquiry Standard A INQ.6: Present information in words and drawings. Students will complete a study comparing one planet to earth. Information will be presented in a paragraph.

Scientific Inquiry Standard A INQ.8: Use nonstandard measures to estimate and compare the sizes of objects. Students will be measuring the planets sizes and distances from the sun in order to compare them to each other and earth.