ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 5

EO C440.03 – DISCUSS CHARACTERISTICS OF THE PLANETS IN THE SOLAR SYSTEM

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the Planets Specifications Sheet located at Attachment A for each cadet.

Create slides of Attachment B to be used in the end of lesson confirmation.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to introduce the cadets to the characteristics of the planets in the solar system and to generate interest in the subject.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have discussed the characteristics of the planets in the solar system.

IMPORTANCE

It is important for cadets to know the characteristics of the planets in our solar system as space exploration continues to develop. The exploration of the solar system is long term and will span many generations. Cadets who are familiar with the solar system may be able to contribute to this exploration.

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Distribute to each cadet a copy of the Planet Specifications Sheet located at Attachment A to be completed as the information is presented during the lesson.

Teaching point 1 **Discuss the planet Mercury.**

Time: 5 min Method: Interactive Lecture

MERCURY

The planet Mercury, named for the Roman messenger god, is the closest planet to the sun. It is the smallest planet and a cratered wasteland. Since it is so close to the sun it means the planet is completely at the mercy of solar radiation, solar flares, and other solar weather phenomena. The planet is also battered by the many asteroids that float through space. The sun's gravitational pull means that these free floating bodies of rock accelerate towards the sun. Depending on Mercury's position in orbit, these asteroids may impact its surface. There are craters on Mercury that are 600 km wide. Our knowledge of this planet is still incomplete. Only one man-made satellite has ever passed by Mercury, and it was able to collect information about only a small portion of the planet's surface.

Mean Distance From the Sun

Mercury is the closest planet to the sun. The range varies from 46 million to 69.8 million km. The mean distance is 57.9 million km.

SIZE

Mercury's diameter is a mere 4 879 km. The planet's diameter is only 0.383 times that of Earth.

MASS

Mercury is the smallest planet in our solar system. Its mass is 0.0553 times the mass of Earth.

ROTATION

Despite the quick pace that the planet travels around the sun, Mercury does not rotate around its own axis very quickly. It takes 58.65 days for the planet to rotate around its axis, or two-thirds of a Mercurian year.

INCLINATION

The axis of Mercury sits at an angle of 0.01 degrees relative to the sun's axis.

Orbit Characteristics

Mercury has what is known as an eccentric orbit. This means that the distance the planet is from the sun varies throughout its revolution around the sun. The actual shape that the planet would travel around the sun would be an ellipse. This can be seen in the extreme range in the planet's distance from the sun. Mercury travels around the sun once every 88 days. This means that the Mercurian year is 88 days long. Mercury's synodic period is 115.9 days.



Synodic period. The time it takes for a planet to return to a specific spot in the night sky as observed from Earth.

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Mercury has an average orbital velocity of 47.9 km / s. This means that the planet travels in its orbit around the sun at an average speed of 47.9 km / s or 172 440 km / h.

CONFIRMATION OF TEACHING POINT 1

The cadets' completion of Mercury's specification box on the Planet Specification Sheet will serve as the confirmation of this TP.

Teaching point 2 **Discuss the planet Venus.**

Time: 5 min Method: Interactive Lecture

VENUS

Travelling from the sun past Mercury, the next planet is Venus. Named for the Roman goddess of love and beauty, Venus is constantly cloaked in cloud. This permanent cover means that scientists know very little about the surface of the planet. Observed from Earth, Venus is the brightest planet in the night sky. The Space Age has greatly enhanced our understanding of this planet. Prior to the 1960s, it was thought that Venus was an oceanic planet equivalent in vegetation to Earth during pre-historic periods. Since the 1960s, several satellites have been sent to Venus or on a path near Venus. These satellites have included Mariner 2 and 10, and the Russian Venera 7, 9, and 13 landings.

Mean Distance From the Sun

Venus is the second closest planet to the sun at a mean distance of 108.2 million km. The distance can range from 107.5 million to 108.9 million km.

SIZE

Venus is very similar in size to Earth. Many scientists refer to Venus and Earth as near-twins. The diameter of the planet at the equator is 12 104 km, approximately 0.949 times that of Earth.

MASS

The mass of Venus is approximately 0.815 times the mass of Earth.

ROTATION

Venus is unique in that it is the only planet in our solar system which rotates east to west, or clockwise. All other planets, including Earth, rotate west to east or counter-clockwise. It takes just over 243 days for Venus to rotate around its axis. It should be noted that this is longer than the Venusian year.

INCLINATION

The axis of Venus sits at an angle of 177.4 degrees. This means that the planets north pole is actually at the bottom of the planet.

Orbit Characteristics

Venus' orbit around the sun is almost perfectly circular which explains the small range of distance from the sun. It takes 224.7 days for Venus to complete one revolution around the sun. This means that one year on Venus is 224.7 days long. Venus' synodic period is 583.92 days, meaning that the planet will return to the same point in the Earth's sky almost every two years. Venus has an orbital velocity of 35.02 km / s or 126 072 km / h.

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CONFIRMATION OF TEACHING POINT 2

The cadets' completion of Venus' specification box on the Planet Specification Sheet will serve as the confirmation of this TP.

Teaching point 3 **Discuss the planet Earth.**

Time: 10 min Method: Interactive Lecture

EARTH

The Earth is the third planet from the sun and is the only planet known to support life. The Earth's atmosphere is composed mainly of nitrogen and oxygen. The temperatures are moderate, due to the ozone layer found in our atmosphere. There is water on Earth, which in current scientific belief is an absolute requirement for life.

Earth has one naturally occurring satellite, Luna. Usually, Luna is simply referred to as the moon. The moon has a profound effect on Earth. Not only is it a constant feature in the night sky, but being the brightest object means that it can provide light on a clear night. Being so close to the Earth (384 000 km) and with a diameter of 3 475 km, the moon also has a gravitational effect on our planet. This effect is most apparent in the tidal patterns of our oceans.

Distance From the Sun

The Earth's average distance from the sun is 149.6 million km. Due to the orbit this can range from 147.1 million to 152.1 million km.

SIZE

Since humans have studied the Earth in depth, we tend to base all of our concepts of planet size relative to the Earth. Earth is therefore the standard by which we measure the size of other planets. Earth's diameter is 12 756 km at the equator.

MASS

Earth's mass is 5.97×10^{21} tonnes. Earth's ratio values for both size and mass are one, since we use the Earth as the standard for measurement.

ROTATION

The Earth rotates west to east around its axis. It takes 23h 56m 04s for the Earth to complete one rotation. This means that the standard Earth day is approximately 24 hours in length.

INCLINATION

Earth's axis is tilted at an angle of 23.5 degrees.

Orbit Characteristics

The Earth's orbit is very circular as seen by the small range in distance from the sun. It takes 365.2 days for the Earth to revolve once around the sun. As such, our standard year is 365 days in length with a leap year every four years to take into account the 0.2 days. The Earth has an orbital velocity of 29.8 km / s or 107 280 km / h.

CONFIRMATION OF TEACHING POINT 3

The cadets' completion of Earth's specification box on the Planet Specification Sheet will serve as the confirmation of this TP.

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Teaching point 4 **Discuss the planet Mars.**

Time: 5 min Method: Interactive Lecture

MARS

Mars is the fourth planet from the sun. Named after the Roman god of war due to its red colour, there are many legends that claim this planet was bright in the sky on the eve of many great victories. Mars has taken a central place in many of today's space programs. At its closest, Mars is 59 million km away from Earth, making it the second-closest planet after Venus. During the space race of the 1960s, the goal was to be the first to set foot on the moon. Now, there is a collaborative effort by many international space agencies to send a manned mission to Mars. The planet itself is currently deemed uninhabitable without the use of artificial environment resources. There have been many probes sent to Mars in recent years to assess the natural environment and evaluate what equipment would be needed in order to sustain human life on the planet.

Mean Distance From the Sun

Mars is nearly twice the Earth's distance from the sun. The mean distance the planet is from the sun is 227.9 million km. This ranges from 206.6 million to 249.2 million km depending on its position in its orbit around the sun.

SIZE

The diameter of Mars at the equator is 6 792 km, which is 0.532 times that of Earth.

MASS

The mass of Mars is 0.107 times that of Earth.

ROTATION

Like Earth, Mars' rotation is west to east and takes 24h 39m 35s. In other words, a standard Earth day is very close in duration to a Martian day.

INCLINATION

The axis of Mars is also very similar to Earth's. The axis of Mars is tilted at an angle of 25.2 degrees.

Orbit Characteristics

The orbit of Mars is eccentric, as shown by the large range in distance from the sun. Mars will revolve around the sun once every 687 days (a little less than two years). Mars has an orbital velocity of 24.1 km / s or 86 760 km / h.

CONFIRMATION OF TEACHING POINT 4

The cadets' completion of Mars' specification box on the Planet Specification Sheet will serve as the confirmation of this TP.

Teaching point 5 **Discuss the planet Jupiter.**

Time: 10 min Method: Interactive Lecture

JUPITER

After passing through the ring of the asteroid belt, the next planet past Mars is Jupiter, the innermost gas giant planet. Named after the leader of the Roman gods (Zeus to the Greeks), Jupiter is the largest planet in our

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solar system. Despite its distance from the Earth, the only planets that can outshine it in the night sky are Earth's neighbours, Venus and Mars.

Jupiter has 63 known natural satellites. Of these, 47 are less than 10 km in diameter, and only 4 are large enough to be considered moons. These are identified as Galilean moons and include:

- Io is in orbit 421 600 km from the centre of Jupiter and takes 1.7 days to orbit the planet. The dimensions of Io are not exactly spherical, measuring 3 660 km by 3 637 km by 3 631 km.
- Europa is in orbit 670 900 km from the centre of Jupiter. It takes 3.5 days for the moon to orbit the planet once. Europa is 3 130 km in diameter.
- Ganymede is in orbit 1 070 000 km from the centre of Jupiter and it takes 7.2 days to complete one full orbit of the planet. Ganymede is 5 268 km in diameter.
- Callisto is in orbit 1 880 000 km from the centre of Jupiter and orbits once every 16.7 days. Callisto is 4 806 km in diameter.

Mean Distance From the Sun

Though Jupiter is the fifth planet in our solar system, the separation provided by the asteroid belt means that Jupiter is a great distance from the sun. The mean distance of Jupiter from the sun is 778.4 million km. Due to its orbit this distance can range from 740.5 million to 816.6 million km.

SIZE

The diameter of Jupiter at its equator is 142 984 km, 11.21 times that of Earth. Due to the rotation of Jupiter, there is a significant difference between the diameter at the equator and the diameter at the poles. The polar diameter is 133 700 km, almost 10 000 km less than the equatorial diameter. By comparison, the difference in diameter between the Earth's equator and poles is a mere 42 km.

MASS

Jupiter's mass is 317.8 times the mass of Earth.

ROTATION

Jupiter rotates at an immense speed which causes the equator to bulge out. This is the reason for the large difference between the equatorial and polar diameters. One day on Jupiter is only 9h 55m 30s.

INCLINATION

Jupiter's axis is only 3.1 degrees from the perpendicular, meaning that Jupiter is almost straight up and down.

Orbit Characteristics

Jupiter has a slightly eccentric orbit. Due to its distance from the sun, it takes the planet 4 331 days (11.86 years) to revolve around the sun. The orbital velocity of Jupiter is 13.1 km / s or 47 160 km / h. Jupiter's synodic period is 398.9 days.

CONFIRMATION OF TEACHING POINT 5

The cadets' completion of Jupiter's specification box on the Planet Specification Sheet will serve as the confirmation of this TP.

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Teaching point 6 **Discuss the planet Saturn.**

Time: 5 min Method: Interactive Lecture

SATURN

Saturn is a very distinct planet in our solar system. It is the second of the gas giants from the sun, the sixth planet in the system. Named after the Roman god of time because of the length of time it takes for the planet to cross the night sky, Saturn is said to be the most beautiful object in the sky when viewed through a telescope.

Mean Distance From the Sun

Saturn is more remote than Jupiter. Orbiting at a mean distance of 1 433.5 million km, Saturn is almost twice as far from the sun as Jupiter.

SIZE

Saturn's equatorial diameter is 120 536 km, which is more than nine times that of the Earth. Saturn is the second largest planet in the solar system.

MASS

Saturn's mass is 95.2 times the mass of Earth.

ROTATION

Saturn rotates on its axis once every 10h 13m 59s. Like Jupiter, the speed at which this occurs causes a slight bulging at the equator, causing the large distortion between the equatorial diameter and the polar diameter.

INCLINATION

The axis of Saturn tilts at an angle of 26.7 degrees.

Orbit Characteristics

Saturn has a slightly eccentric orbital path. It travels around the sun in 10 747 days or 29.43 years. Saturn's synodic period is 378.1 days. The orbital velocity of Saturn is 9.7 km / s or 34 920 km / h.

CONFIRMATION OF TEACHING POINT 6

The cadets' completion of Saturn's specification box on the Planet Specification Sheet will serve as the confirmation of this TP.

Teaching point 7 **Discuss the planet Uranus.**

Time: 5 min Method: Interactive Lecture

URANUS

Uranus is a very distinct planet which shares some of the characteristics of Saturn. Most prominent of these are the rings which orbit the planet, but even here there is uniqueness. Uranus is barely visible to the naked eye and the study of Uranus actually led to the discovery of the next planet in the solar system. The planet is named after the mythological father of Saturn.

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Mean Distance From the Sun

Uranus is the second-furthest planet from the sun. The mean distance is 2 872.5 million km with a maximum of 3 003.6 million km and a minimum of 2 741.3 million km. Compared to Saturn, Uranus is twice as far from the sun and four times as far as Jupiter.

SIZE

Uranus is just over one third the size of Jupiter, but is still the third largest planet in the solar system. It has an equatorial diameter of 51 118 km, which is 4.01 times that of Earth.

MASS

Uranus' mass is 14.5 times that of Earth.

ROTATION

Uranus rotates around its axis once every 17h 14m.

INCLINATION

The axis of Uranus tilts at an angle of 97.8 degrees. This means that it is technically on its side and the rings of Uranus look like they are vertical compared to Saturn's rings. Also, the satellites orbit Uranus on a vertical plane instead of a horizontal plane like the other planets.

Orbit Characteristics

Uranus has an irregular orbit. There is a point in the orbit where Uranus, as viewed from Earth, performs two 180-degree turns. This would look like a giant Z in the orbital path. It takes Uranus 83.76 years to orbit the sun once. Its mean orbit velocity is 24 607 km / h. The synodic period of Uranus is 369.7 days.

CONFIRMATION OF TEACHING POINT 7

The cadets' completion of Uranus' specification box on the Planet Specification Sheet will serve as the confirmation of this TP.

Teaching point 8 **Discuss the planet Neptune.**

Time: 5 min Method: Interactive Lecture

NEPTUNE

Named after the Roman god of the sea, Neptune was found as a result of scientific study of Uranus. Almost all of our knowledge of Neptune comes from one spacecraft, Voyager 2, which flew past the planet in 1989. The atmosphere is made up predominantly of hydrogen, helium and methane. The planet is a very windy place, with equatorial winds in excess of 450 m / s or 1 620 km / h.

Mean Distance From the Sun

Neptune is approximately half again as far as Uranus from the sun. Orbiting at a mean distance of 4 495.1 million km, it is 20 times as far as Mars. Neptune is the last planet in the solar system, keeping in mind that Pluto has been down-graded to a dwarf-planet.

SIZE

Neptune is nearly identical in diameter to Uranus at 49 528 km, 3.88 times the diameter of the Earth.

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MASS

Neptune's mass is more than 18 percent greater than Uranus' and 17.1 times the mass of the Earth.

ROTATION

It takes Neptune 16h 7m to rotate once around its axis. This is the third fastest rotation of all of the planets.

INCLINATION

The tilt of Neptune's axis is 28.3 degrees, slightly more than Earth's.

Orbit Characteristics

Neptune's orbit is almost perfectly circular. It takes Neptune 163.7 years to orbit the sun, almost twice as long as Uranus. Its mean orbit velocity is 19 720 km / h. Neptune's synodic period is 367.5 days.

CONFIRMATION OF TEACHING POINT 8

The cadets' completion of Neptune's specification box on the Planet Specification Sheet will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

Show the cadets the slides of Attachment B and have them correct their own notes on the *Planet Specifications Sheet* located at Attachment A, which they completed during the lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

The planets are more than just individual bodies floating in space. They are part of a large system and in some cases they are the centre of their own sub-system. Understanding the scale of this system is very important to understanding space exploration. With the mission to Mars moving in to the forefront of space news, we need to realize that this is not a small project, but one that could take years because of the distance and equipment required. In addition, understanding the scale of the solar system and the scale location of the nearest star gives us a taste of the vastness of the universe and the importance of astronomy in our lives.

INSTRUCTOR NOTES / REMARKS

Planetary data is provided in detail at http://solarsystem.nasa.gov/planets/index.cfm

Cadets who are qualified Advanced Aerospace may assist with this instruction.

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REFERENCES

C3-170 Ottewell, G. The National Optical Observatory. (1998). *Thousand-yard model: Or Earth as a peppercorn*. Retrieved October 16, 2007, from http://noao.edu/education/peppercorn/pcmain.html

C3-288 Williams, D. NASA. (2008). *Planetary fact sheet – metric*. Retrieved October 14, 2008, from http://nssdc.gsfc.nasa.gov/planetary/factsheet/index.html

C3-289 Williams, D. NASA. (2008). *Planetary fact sheet – ratio to earth values*. Retrieved October 14, 2008, from http://nssdc.gsfc.nasa.gov/planetary/factsheet/planet_table_ratio.html

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PLANET SPECIFICATIONS SHEET

Mercury

Distance from the sun: _____ million km. Size: _____ km.

Mass_____ Earth Mass

Axis - Time of rotation: _____ Axis - Inclination: _____ degrees

Orbit: _____ days Orbit speed _____km / h.

Venus

Distance from the sun: _____ million km. Size: _____ km.

Mass_____ Earth Mass

Axis - Time of rotation: _____ Axis - Inclination: _____ degrees

Orbit: _____ days Orbit speed _____km / h.

Earth

Distance from the sun: _____ million km. Size: _____ km.

Mass_____ Earth Mass

Axis - Time of rotation: _____ Axis - Inclination: _____ degrees

Orbit: _____ days Orbit speed _____km / h.

Mars

Distance from the sun: _____ million km. Size: _____ km.

Mass_____ Earth Mass

Axis - Time of rotation: _____ Axis - Inclination: _____ degrees

Orbit: _____ days Orbit speed _____km / h.

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Jupiter

Distance from the sun: _____ million km. Size: _____ km.

Mass_____ Earth Mass

Axis - Time of rotation: _____ Axis - Inclination: _____ degrees

Orbit: _____ days Orbit speed _____km / h.

Saturn

Distance from the sun: _____ million km. Size: _____ km.

Mass_____ Earth Mass

Axis - Time of rotation: _____ Axis - Inclination: _____ degrees

Orbit: _____ days Orbit speed _____km / h.

Uranus

Distance from the sun: _____ million km. Size: _____ km.

Mass_____ Earth Mass

Axis - Time of rotation: _____ Axis - Inclination: _____ degrees

Orbit: _____ days Orbit speed _____km / h.

Neptune

Distance from the sun: _____ million km. Size: _____ km.

Mass_____ Earth Mass

Axis - Time of rotation: _____ Axis - Inclination: _____ degrees

Orbit: _____ days Orbit speed _____km / h.

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PLANET SPECIFICATIONS ANSWER KEY

Mercury

Distance from the sun: __57.9___ million km Size: _4 879_ km

Mass_0.0553__ Earth masses

Axis - Time of rotation: __58.65 d_ Axis - Inclination: _0.01_ degrees

Orbit: _88_ days Orbit speed __172 440___km / h.

Venus

Distance from the sun: __108.2__ million km Size: _12 104 km

Mass_0.815__ Earth mases

Axis - Time of rotation: _243_d Axis - Inclination: 177.4_ degrees

Orbit: __224.7 days Orbit speed _126 072_km / h.

Earth

Distance from the sun: __149.6__ million km Size: _12 756 km

Mass: __1__ Earth masses.

Axis - Time of rotation: 23h 56m 4s Axis - Inclination: _23.5_ degrees

Orbit: _365.2_ days Orbit speed _107 280_km / h.

Mars

Distance from the sun: _227.9___ million km Size: _6 792_ km

Mass: _0.107__ Earth-masses

Axis - Time of rotation: 24h 37m 23s Axis - Inclination: _25.2_ degrees

Orbit: _687___ days Orbit speed __86 760_km / h.

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Jupiter

Distance from the sun: 778.6 million km Size: 143 984 km

Mass 317.8 Earth-masses

Axis - Time of rotation: 9h 55m 30s Axis - Inclination: 3.1 degrees

Orbit: 11.86 years Orbit speed 47 160 km / h.

Saturn

Distance from the sun: 1 433.5 million km Size: 120 536 km

Mass 95.2 Earth masses

Axis - Time of rotation: 10h 13m 59s Axis - Inclination: 26.7 degrees

Orbit: 29.43 years Orbit speed 34 920 km / h.

Uranus

Distance from the sun: 2 872.5 million km Size: 51 118 km

Mass 14.5 Earth masses

Axis - Time of rotation: 17h 14m Axis - Inclination: 97.8 degrees

Orbit: 83.76 years Orbit speed 24 607 km / h.

Neptune

Distance from the sun: 4 495.1 million km Size: 49 528 km

Mass 17.1 Earth masses

Axis - Time of rotation: 16h 7m Axis - Inclination: 28.3 degrees

Orbit: 163.7 years Orbit speed 19 720 km / h.

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