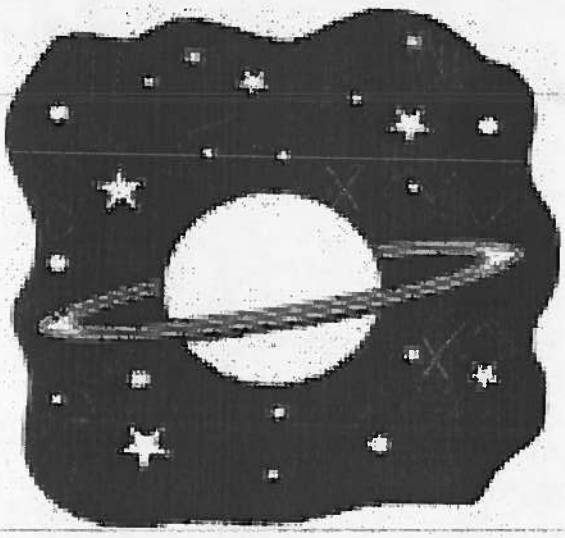
Science Workbook-



Sky Science

Grade: 6
Unit: Sky Science

I can statements.....	Yes	Sort of	No
I can recognize that the Sun and stars emit light while other bodies in space are seen by reflected light.			
I can describe the location and movement of individual stars and constellations as the move through the sky.			
I can recognize that the apparent movement of objects in the night sky is regular and predictable.			
I can recognize and explain how the apparent movement of sky objects is related to the Earth's rotation.			
I can understand that the Sun should never be viewed directly or with simple telescopes or filters.			
I can understand that safe viewing of the Sun requires appropriate methods and safety precautions.			
I can construct and use a device for plotting the apparent movement of the Sun over the course of a day.			
I can describe seasonal changes in the length of the day and night and in the angle of the Sun above the horizon.			
I can recognize that the moons phases are regular and predictable.			
I can describe the cycle of the moon's phases.			
I can illustrate the phases of the moon in drawings and by using improvised models.			
I can recognize and provide examples that the other eight known planets have characteristics and surface conditions that are different from Earth.			
I can recognize that not only Earth, but other planets, have moons.			
I can identify examples of similarities and differences in the characteristics of different moons.			
I can identify technologies and procedures by which knowledge, about planets and other objects in the night sky, has been gathered.			
I can understand that Earth, the Sun and the moon are part of a solar system that occupies only a tiny part of the known universe.			

- Glossary -

Altitude: The distance a heavenly body appears above the horizon as measured in degrees.

Annual Motion: The Earth's orbital motion around the Sun every year.

Aphelion: The point in the Earth's orbit where the Earth is farthest away from the Sun.

Asteroid Belt: The area between the inner and outer planets that is filled with asteroids.

Asteroids: Chunks of rock that vary in size from very large (approximately 1030 km in diameter) to quite small. They orbit the sun between the orbits of Mars and Jupiter. About 3000 asteroids have been discovered.

Asterism: Stars that form patterns but are generally smaller than or part of a constellation. The Big Dipper is an asterism and forms part of the constellation Ursa Major.

Astronomy: The study of the Universe and all of the bodies that appear in the skies.

Atmosphere: A layer of air between the Earth and outer space.

Axis: A straight line that an object or body rotates, or seems to rotate around.

Binary Stars: When two relatively close stars revolve around each other, often appearing as single stars because they are so far away from the Earth.

Black Hole: An intense gravitational field created when a star runs out of fuel and collapses. Nothing, not even light can escape its pull.

Blue Moon: The second full moon in the same calendar month.

Calibrate: To determine, check or adjust a scale of any measuring instrument.

Celestial Equator: An imaginary line in the sky directly above the Earth's equator.

Celestial Hemisphere: The heavens surrounding the Earth, split into two parts directly above the Earth's equator, can be identified as the northern and southern celestial hemispheres.

Celestial Sphere:	The heavens surrounding the Earth.
Comet:	A large ball of ice, dust, rock and gas that orbits the Sun, circling the dark edges of the Solar System.
Constellations:	Bright stars grouped according to the patterns they make in the sky (such as Orion or Ursa major). There are 88 constellations that cover the sky; many of their names coming from characters in ancient mythology.
Copernicus, Nicolaus (1493-1543):	A Polish scientist who was the first to re-introduce the idea originally stated by some radical Greek philosophers 2000 years earlier, that the Sun and not the Earth, was the center of the solar system.
Crater:	A hole created on the surface of an object or body, made by falling meteorites or by erupting volcanoes.
Emit:	To send or give out.
Eclipse:	Of two types, solar and lunar. A solar eclipse is when the moon passes in front of the Sun, covering the Sun's disk, either partially or totally. A lunar eclipse is when the full moon passes through the Earth's shadow, and sunlight is prevented from falling onto the moon's surface. From Earth, The moon appears to grow dark.
Ecliptic:	The apparent great–circle annual path of the Sun, as seen from the Earth. It is called the *ecliptic* because eclipses occur only when the moon is on or near this path.
Equator:	An imaginary circle around the centre of the Earth, perpendicular to the axis of rotation.
Equinox:	During the Sun's annual path in the sky it crosses the celestial equator at two points – the equinox points. On these two days on or about March 21, September 23, of every year, the day is divided between twelve hours of sunlight and twelve hours of darkness.
Galaxy:	A spiral island of stars in space. Our galaxy is called the Milky Way.
Gibbous:	A phase in the Moon's cycle when more than half of the moon, but not the entire face of the Moon, is illuminated.

Gravity: A force that attracts and holds the universe together. It gives objects weight.

Hemispheres: Either the north or the south half of the Earth divided by the equator, or the east or west half divided by the prime meridian.

Inner Planets: The four hard rocky planets – Mercury, Venus, Earth, Mars – closest to the Sun.

Latitude: The distance of a point on the Earth's surface north or south of the equator, measured in degrees. For example, Edmonton's latitude is 53.5° North. The latitude of the Canada – USA border in western Canada is 49° North.

Light Year: The distance light travels in a year. This unit is used to measure distances in space. One light year is about 9.5 trillion km.

Longitude: This distance of a point on the Earth's surface measured parallel to the equator west from the 0° Greenwich Meridian. Edmonton's longitude is 113.4° west.

Lunar Eclipse: When the moon moves into the Earth's shadow, preventing sunlight from falling onto the moon's surface.

Lunar Month: The time it takes the moon (27 1/3 days) to go around the Earth.

Lustre: Sheen or shine.

Magnitude: A scale used to measure the brightness of stars and other objects in the sky. Magnitudes range from: -23 (the Sun) -3 to -4.5 (Venus) to stars from -1.5 → 21 or fainter.

Meteor: When a meteoroid enters the Earth's atmosphere, creating a bright streak of light, it is called a meteor or a shooting star.

Meteorite: Larger meteors that fall to the surface of the Earth.

Meteoroids: These rocks, usually not much bigger than grains of sand, may have been swept off asteroids and comets. They also orbit the Sun, sometimes entering the Earth's atmosphere.

Midnight Sun:	On June 21st from a point on the *Arctic Circle*, the Sun will appear to descend into the north-west, but instead of setting it will appear to skim the northern horizon and rise up again in the north-east. This never–setting sun known as the *Midnight Sun*. The further north you go the more days of Midnight Sun you experience during the year.
Moon:	The name of the satellite that orbits the Earth.
Moon Phases:	A cycle in which the Moon appears in different forms as it orbits the Earth.
Orbit:	The path of a planet or other heavenly body as it revolves around another body in space.
Outer Planets:	The four giant, gaseous planets – Jupiter, Saturn, Uranus, Neptune – and Pluto that orbit the Sun.
Perhilion:	The point in the Earth's orbit where it is closest to the Sun.
Planets:	Large bodies that can only be seen by reflected light, as they revolve around the sun. The word planet comes from the Greek word wanderer.
Pole Star:	A bright star, also known as North Star or Polaris, that appears in the sky in the northern hemisphere. A useful bench mark as it always stays in the same position in the northern sky.
Revolution:	The motion of a planet along its orbit around the Sun. For example, the Earth takes one year to "revolve" around the Sun.
Rotation:	The motion of a planet satellite, or the Sun around its north-south axis. It takes 24 hours for the Earth to rotate once on its axis.
Satellite:	A man made or heavenly body (Moon) that orbits around a larger object.
Solar Eclipse:	When the Moon passes in front of the Sun, partially or totally covering it.
Solar Noon:	When the Sun reaches its highest point in the sky.
Solar System:	The Sun and all of the bodies – planets, satellites, asteroids, comets, etc. that orbit around it.

Solstices:	Once a year the Sun reaches it highest and lowest points in the sky at noon. In the northern hemisphere, the lowest point and least number of daylight hours takes place on or about December 21st. It reaches its highest point and greatest number of daylight hours on or about June 21st. In the Southern Hemisphere the dates are reversed.
Star:	A gaseous body that produces its own energy through nuclear fusion, releasing it as light and heat.
Stellar Astronomy:	The study of the stars.
Sublimate:	To turn directly from a solid into a gas.
Sun:	The closest star to the Earth, measuring more than a million kilometers across.
Sundial:	A device that uses shadow to tell time.
Texture:	The surface look or feel of something.
Universe:	Everything that exists: the Earth, the Sun, the Moon, satellites, stars, asteroids, all the galaxies and the space in between them.
Waning Moon:	When the Moon grows gradually more illuminated when passing from new to full moon.
Waxing Moon:	When the Moon grows gradually more illuminated when passing from new to full moon.
Year:	The time it takes for a planet to go all the way around the Sun i.e., on Earth a year is 365 days. One year on Uranus is 84 earth years.

Sky Science Note Package

Stars and Comets

Stars create lights through their nucleus at the center of the star. They give out or send their own light. This means that stars emit or give out their own light. Other light emitting objects in space are comets. A **comet** is a mass (or chunk) of frozen gasses, ice, and rock debris that orbits the Sun.

Some planets look like they also emit their own light, however, this is not true. Planets and moons do not emit any of their own light. Planets and moons gain their light due to **reflected light**. Reflected light consists of light that is reflected from another object. Planets and moons gain their light from the Sun. The Sun shines on the planets, and we see the reflected light.

Asteroids also reflect the light. Asteroids are rocky, metallic objects that orbit the Sun. Asteroids that are on a collision course with Earth are called meteoroids. Most meteoroids burn up when they hit the Earth's surface.

Comets: A comet or *hairy star* is a celestial body that is usually in an elliptical orbit around the Sun. A comet resembles a dirty snowball. It is made mostly of snow and dirt, but might also contain organic matter (compounds containing carbon). As the comet approaches the Sun it becomes very bright and might develop a tail sometimes extending many millions of kilometres into space. This tail is caused by the solar heat, which evaporates or sublimates. The tail of the comet is caused when it approaches the Sun and the surface starts to heat up. This causes material like the water to melt and the carbon dioxide to sublimate. The gases are then pushed away from the comets nucleus and coma (the comets head) by the solar wind. The tail of the comet is always pointing away from the Sun. As the comet starts to leaves the inner solar system (moves away from the Sun) it will freeze up again until its next return.

Sublimate: turn directly from a solid to a gas- which is what carbon dioxide does at room temperature and comets do when they are heated up by the Sun.

Looking at the Stars

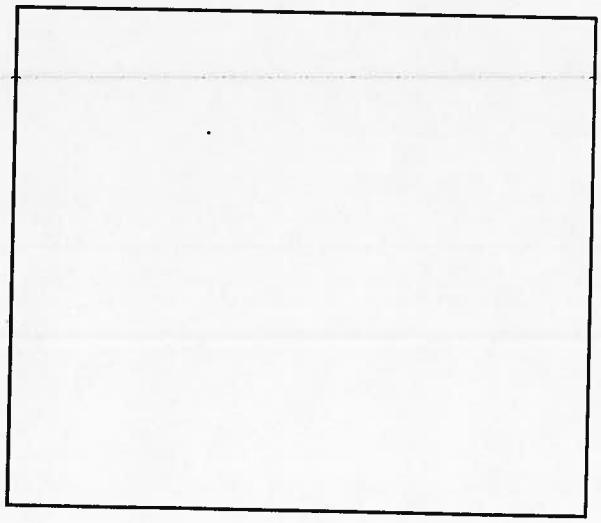
Stars are amazing burning balls of gas that have many distinct features. Stars create or emit their own light. Some stars are visible during certain seasons but not other seasons. We only see the stars that are in the part of the sky that is away from the Sun's light. When we look at the stars, they appear to be twinkling. *Stars do not actually twinkle.* Convention currents in Earth's atmosphere affect the light we see from the stars. Light takes time to reach the Earth because of the long distance between the Earth and the stars. So when we see the light from the Sun and stars we are actually seeing light that was emitted in the past. Sunlight actually takes 8 minutes and 17 seconds to reach the Earth.

Years ago people believed that the stars were moving. However, this is not true- it looks that way because the Earth is moving. The Earth spins every 24 hours, and orbits the Sun once a year. The Earth's tilting on its axis gives us the seasons as well as changing the constellations that we see at a given time. As we move along the Earth's orbit we see different parts of the night skies. We follow the same pattern around the Sun. Each year we can see he same stars in the sky at the same of the year. There are some constellations that we can see all year long.

Constellations were first recorded and named by the early Greeks who used the patterns in the sky to tell about mythology and the gods. The constellations that we see all year long are called **circumpolar constellations.** Circumpolar constellations all orbit around one star, the **North Star** or Polaris. **Ursa Major (Big Dipper), Ursa Minor (Little Dipper), and Cassiopeia** are circumpolar constellations. The rest of the constellations follow a constant and predictable pattern each year.

Brightness Gauge

A Greek astronomer named Hipparchus noticed that some stars appear to be brighter than others. Hipparchus rated the stars on their brightness. He called brightness magnitude. Hipparchus created the scale from 1-6, with one representing the brightest star and 6 representing a star that is barely visible.



Quiz 1. **Name.** _____

1. State which emits light and which reflects light.
   - A. Sun _____
   - B. Earth _____
   - C. Comet _____
   - D. Star _____
   - E. Moon _____
2. Explain the difference between emission of light and reflection of light.

   _____

   _____

   _____

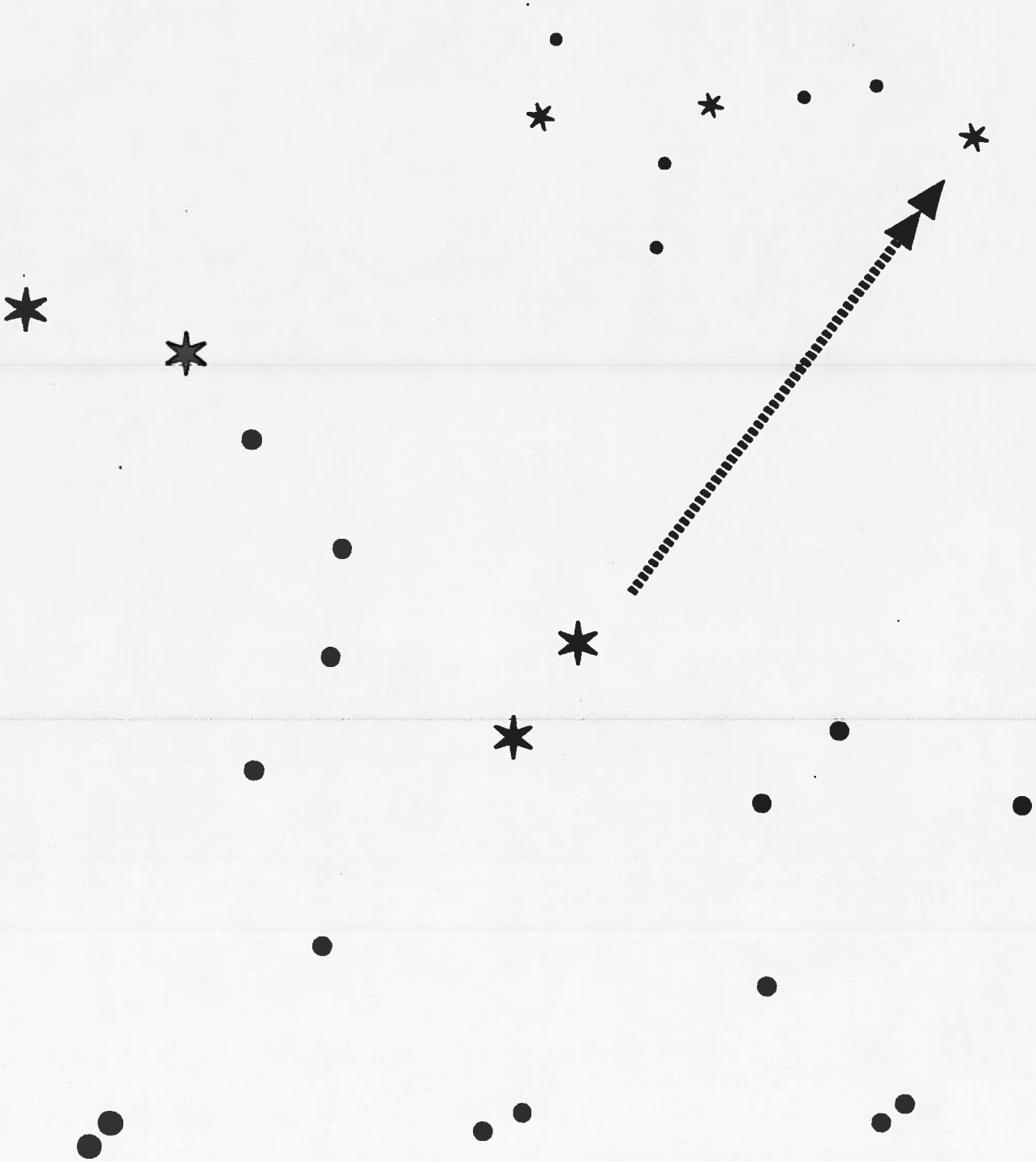
3. Match column A with the correct definition in column B.

Column A.	Column B.
1. Comet	A group of stars that form a picture
2. Constellation	Dent on the moon
3. Asteroid	Object in space formed from rock, frozen water and gasses.
4. Crater	Distance light travels in one year.
5. Light Year	Small planets.

Name: _____

Master #2a

Starry Starry Night – Student Sheet



Name: _____

Date: _____

Master #2c

Constellations – Student Sheet

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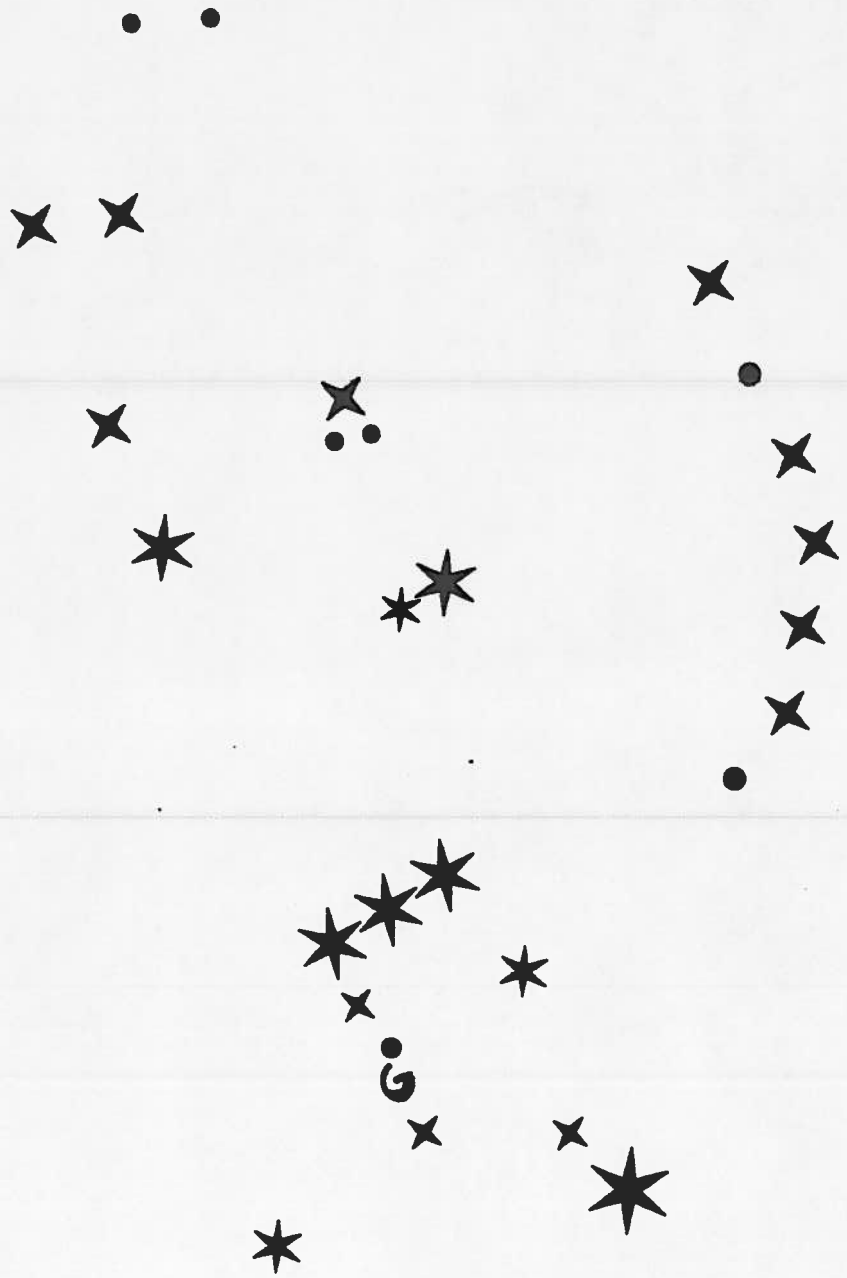
Name: _____

Date: _____

Master #2e

Orion's Belt – Student Sheet



Name: _____ **Master #8**

Date: _____

Star Finder – Recording Sheet

Look at the night sky once a week for five weeks. Make a journal of your observations in the table below. Use the instruments we made in class *(Star Finder Brightness Gage)*.

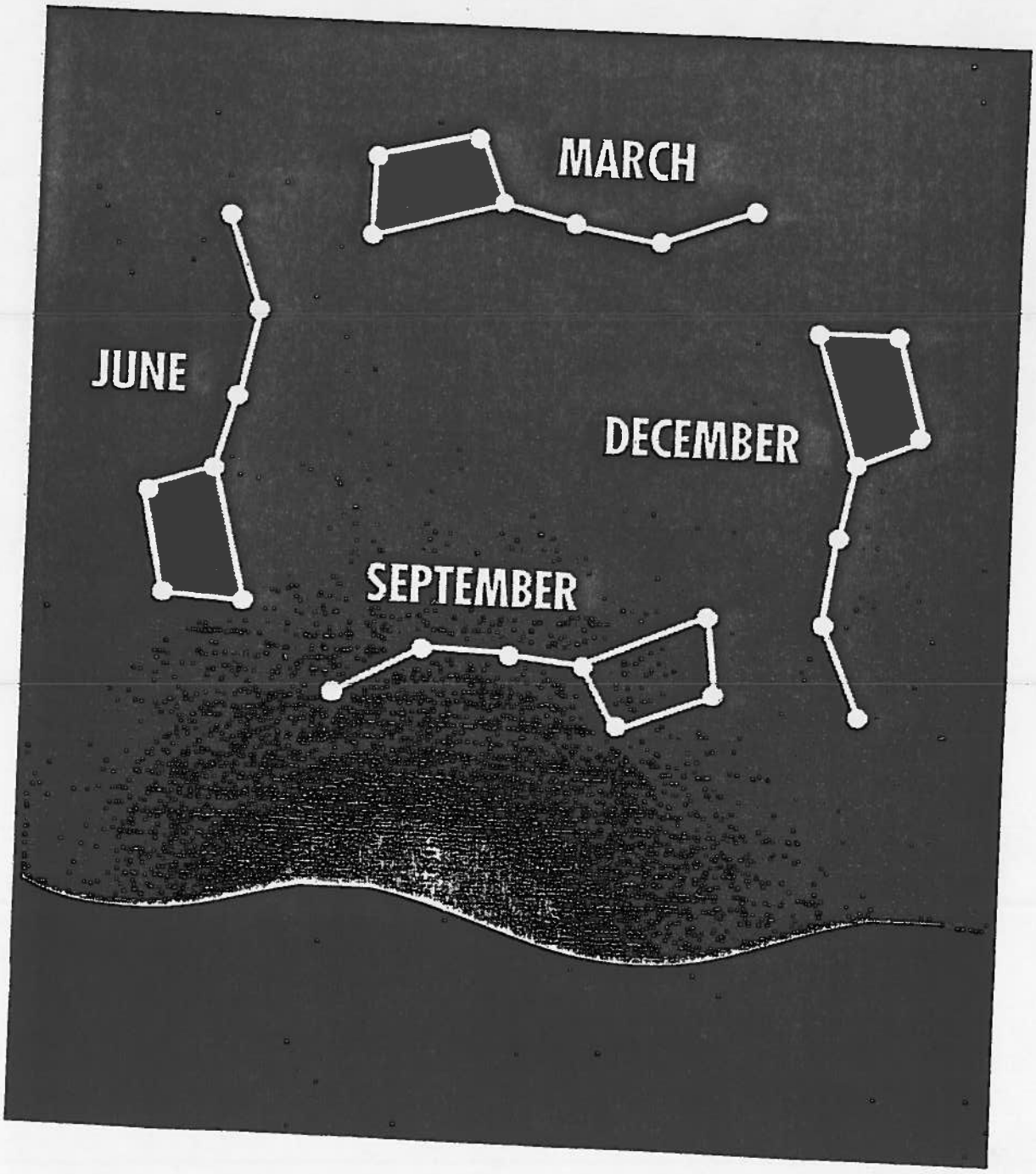
Date	Constellations visible *(List 3)*	Brightness investigation *(Name of the constellation)*

Name: _____

Date: _____

Master #4

Big Dipper Movement



Task: **Star Finder (homework)**

Name: _____

Date: _____

Stand in the same position and direction each time you make your observation.

1. Use your star finder to help you locate The Big Dipper in the sky one night this week. Record your observations. Date: _____

2. Do a second observation (at the same time as the previous observation) of the Big Dipper in the night sky *one week* to *ten days* later. Record what you see.
   Date: _____

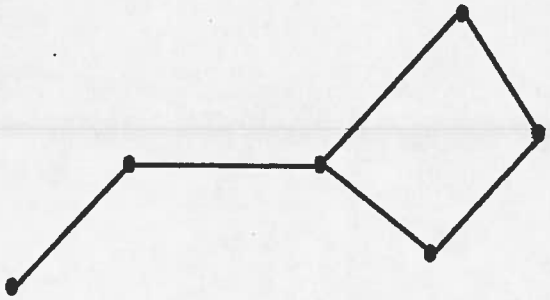
3. Predict what position The Big Dipper will be in the night sky in your area six weeks from now, at the same time. Draw your prediction.
   Date will be: _____

Task: Star Finder

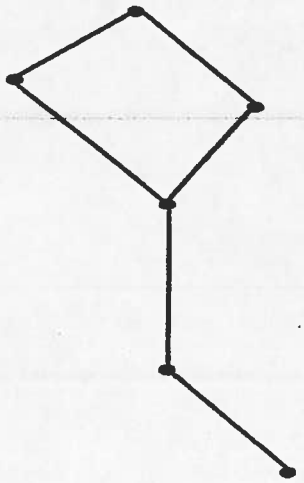
Name: _____

Date: _____

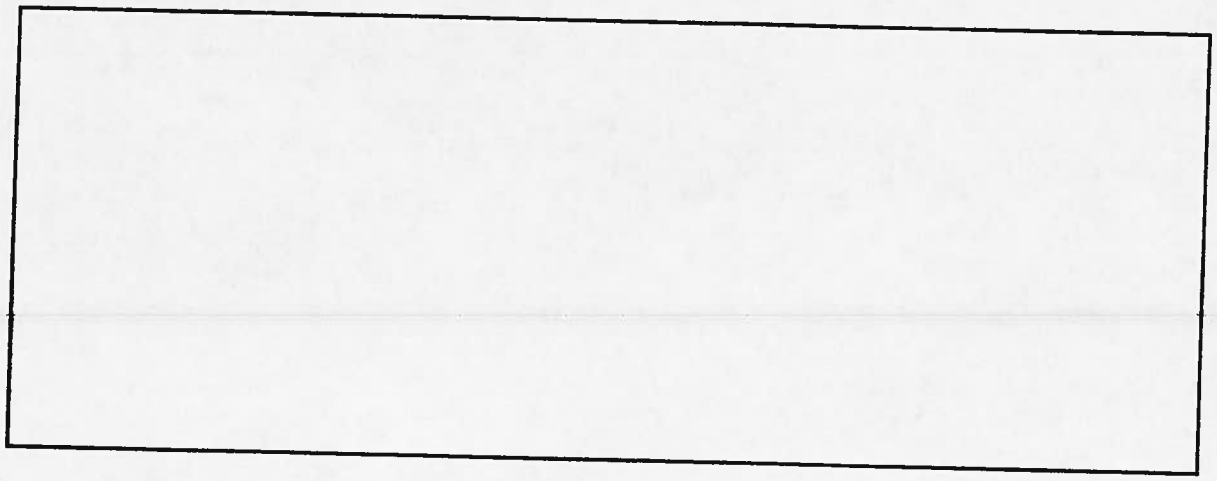
1. Van went out on December 1 to view the Big Dipper. He looked at the sky to the North and this is what he saw:



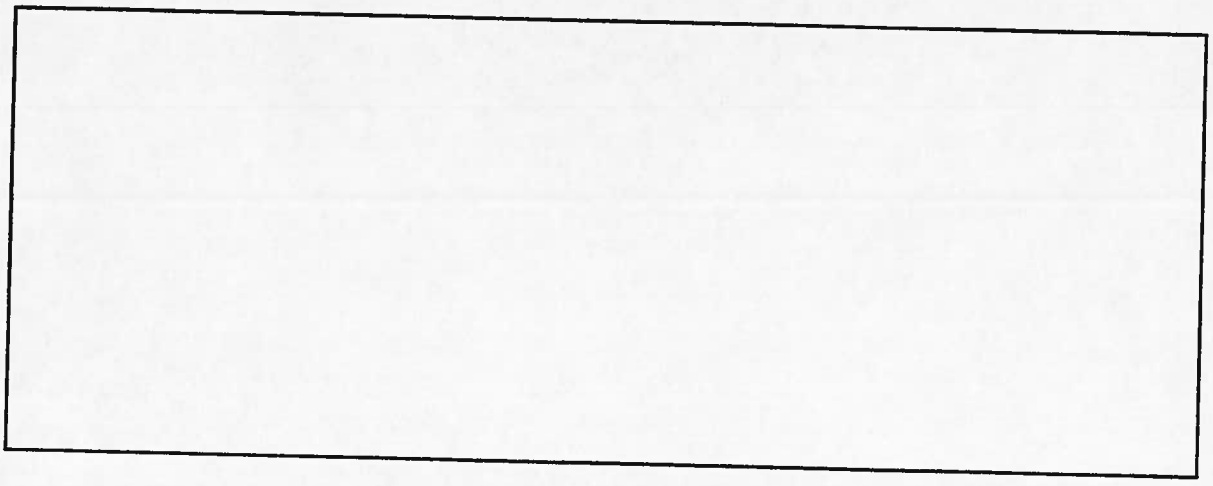
On March 1, Van went out, at the same time, to observe the Big Dipper again. This is what he saw.



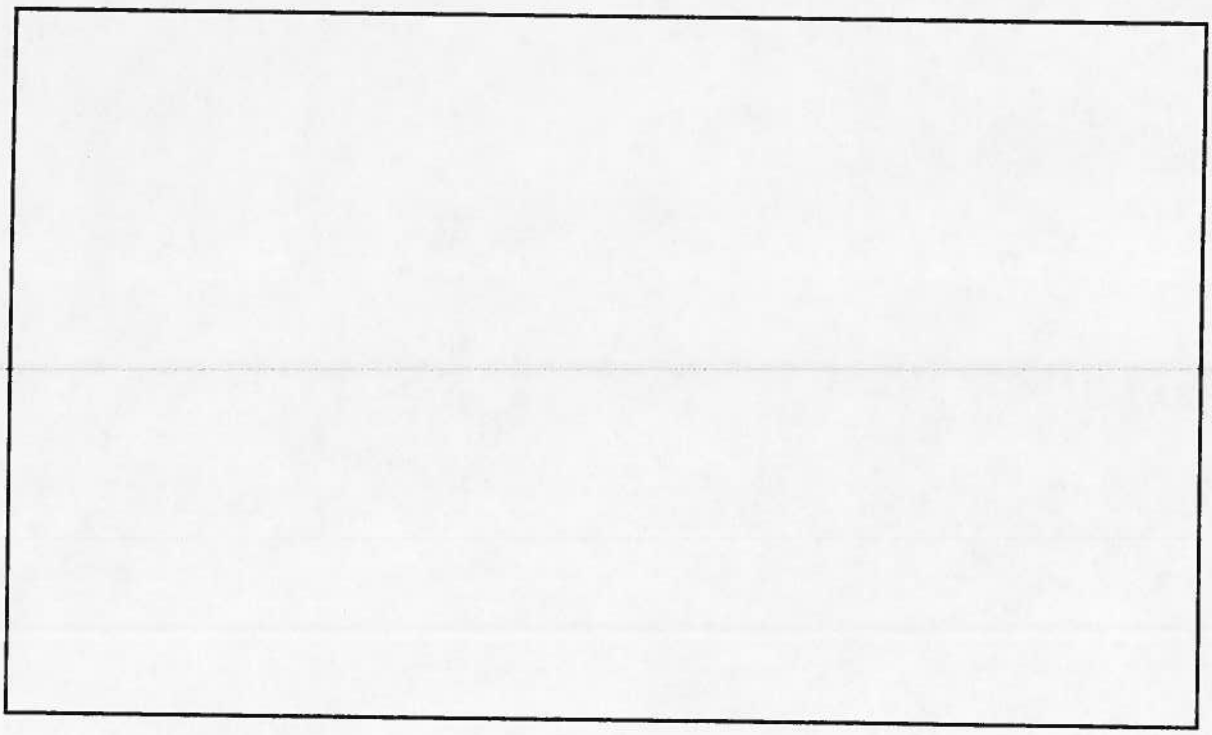
a. What did the Big Dipper look like on January 15? Why? Draw a picture.



b. Predict what the Big Dipper will look like on June 1. Draw a picture.



2. Van's little sister wanted to know why the stars moved around in the sky at night. How could Van explain the movement of the stars to his little sister? Draw a picture in the box below. Write your explanation on the lines below.



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4. Describe what you observed about the movement of this cluster of stars.

_____

_____

5. Now look back to your answers for question 1 of Star Finder. Were they correct or do they need to be changed?

_____

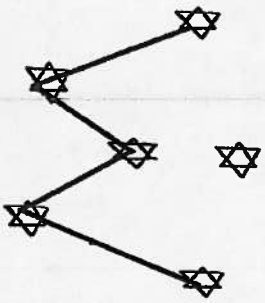
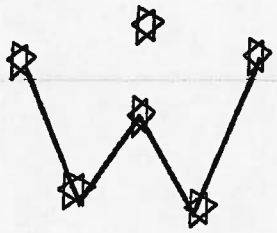
_____

6. Explain whether or not the stars are really moving.

_____

_____

7. Imagine that you saw the following constellation at midnight during different seasons. Draw the position of the constellation when viewed in summer and autumn.

Winter	Spring
	
Summer	Autumn

Name: _____

Date: _____

Master #9a

Casting Shadows – Recording Sheet

SHADOWS	
Time	Length of Shadow

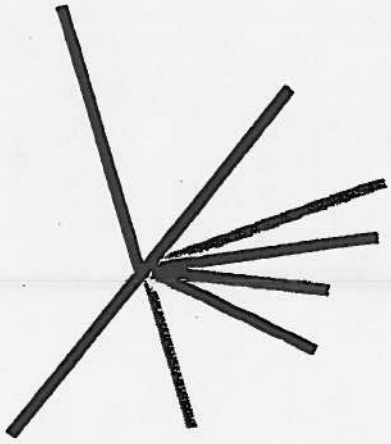
Name: _____

Date: _____

Master #9b

Casting Shadows

SHADOWS	
Time	Length of shadow *(mm)*
9:00	191 mm
9:30	186 mm
10:00	177 mm
10:30	168 mm
11:00	150 mm
11:30	147 mm
12:00	149 mm
12:30	145 mm
1:00	159 mm
1:30	163 mm
2:00	179 mm
2:30	182 mm



Measuring the length of shadows cast by a stick at various points throughout the day, provides you with data that can easily be turned into a bar graph. Use the data in the table above to complete this graph.

Shadow length *(mm)*

9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	1:00	1:30	2:00

Time

20

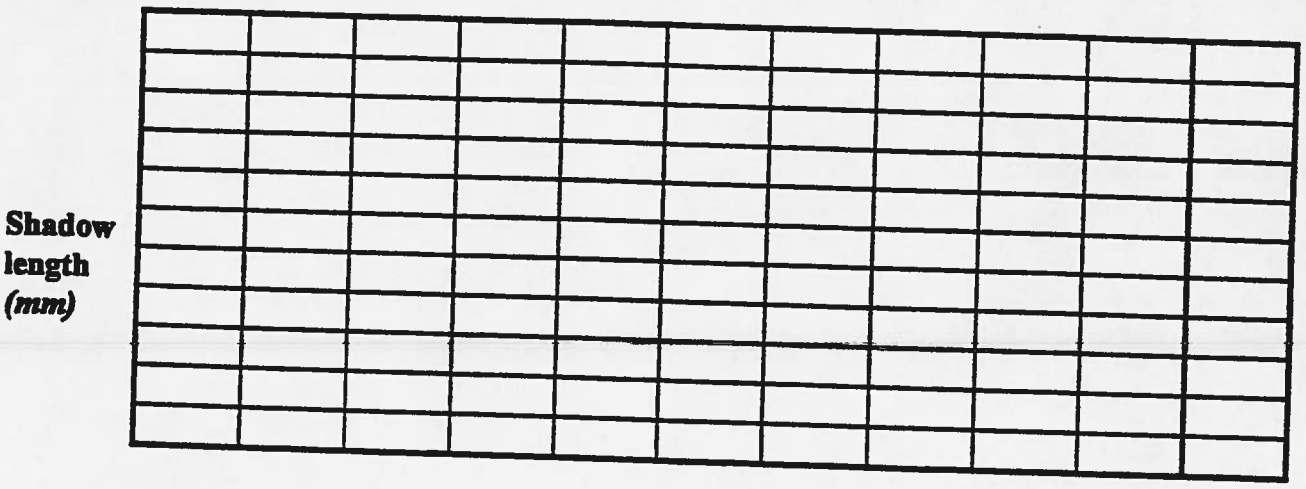
Name: _____

Date: _____

Master #10

Shadow Graph

Shadows



1. Describe the *pattern/trend* formed by your graph.

_____

_____

_____

_____

2. How did the *length* of the shadow change throughout the day?

_____

_____

_____

_____

3. At what time did the *shortest* shadow occur?

4. Determine the approximate time of *"solar noon"* by comparing your results with your classmates.

5. Do you think that *"solar noon"* will be the same time tomorrow? Explain.

6. Would the shadows make the same pattern/trend if this data was collected in another *season*? Explain.

7. Labeled diagram:

Name: _____

Master #11c

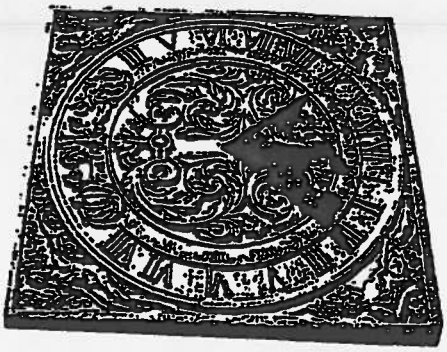
Date: _____

Sundials

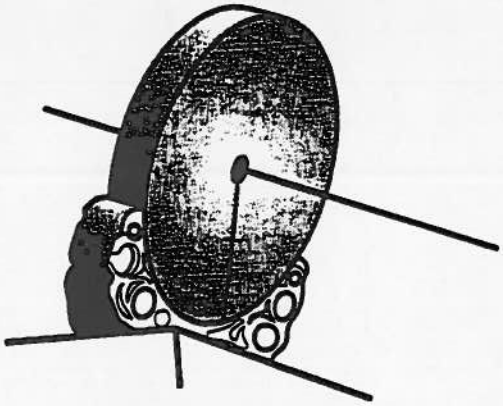
A sundial an instrument that uses shadows to tell time.

The Sun's apparent movement across the sky acted as the principal timekeeper for early people, and predominated as the main means for telling time. The sundial consists of a triangular central piece *(gnomon)* which casts a shadow on a numbered scale of hours.

*The numbers are placed *closer* together towards noon, and *farther* apart towards morning and evening, because the shadow moves more slowly over the sundial at midday when the sun is overhead.



Ancient Sundial:



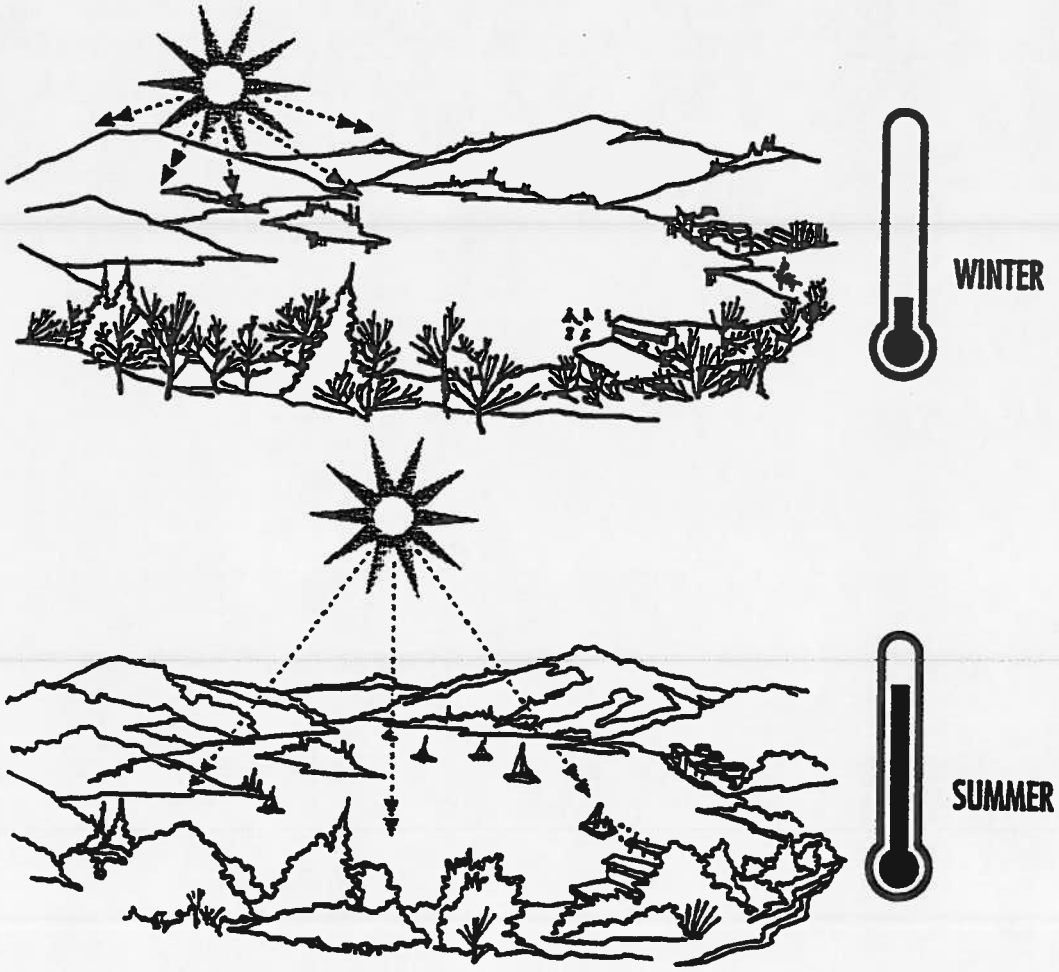
Sundial from China

Name: _____

Date: _____

Master #12a

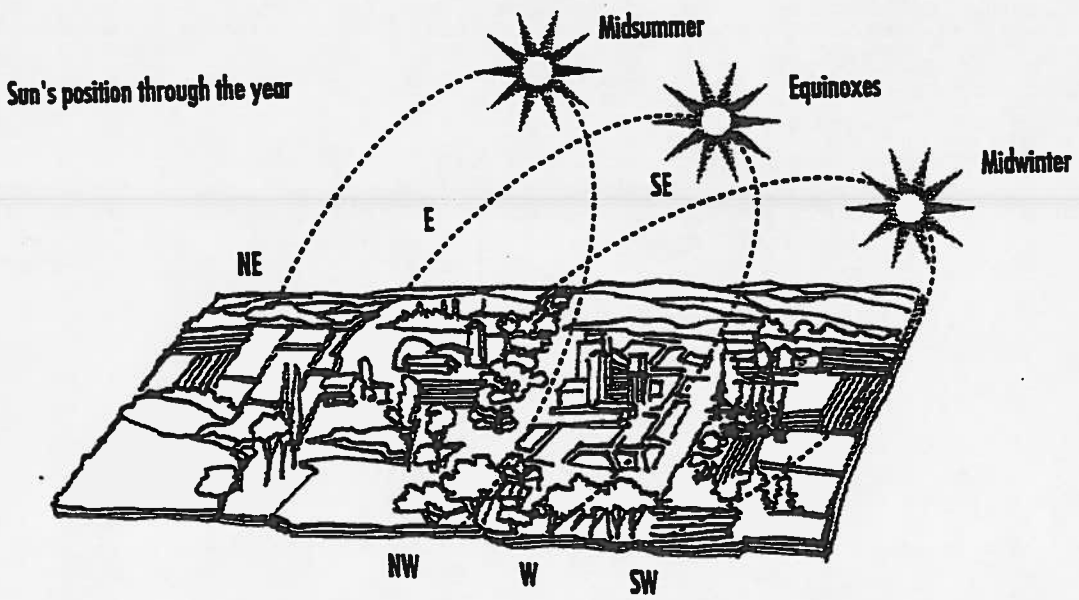
Reasons For The Seasons – Pictures

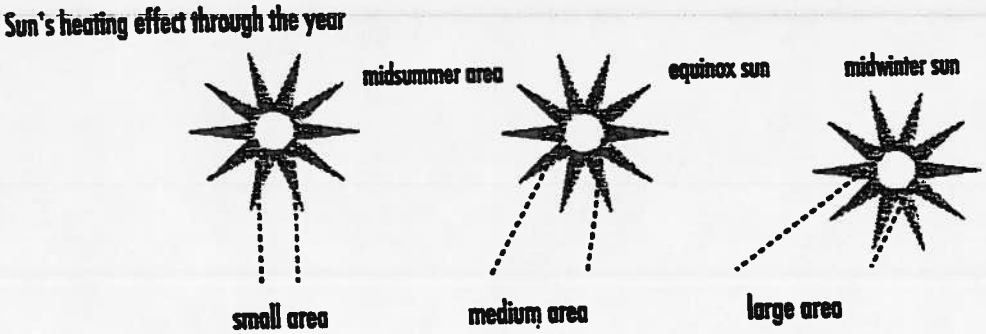


Name: _____ **Master #12b**

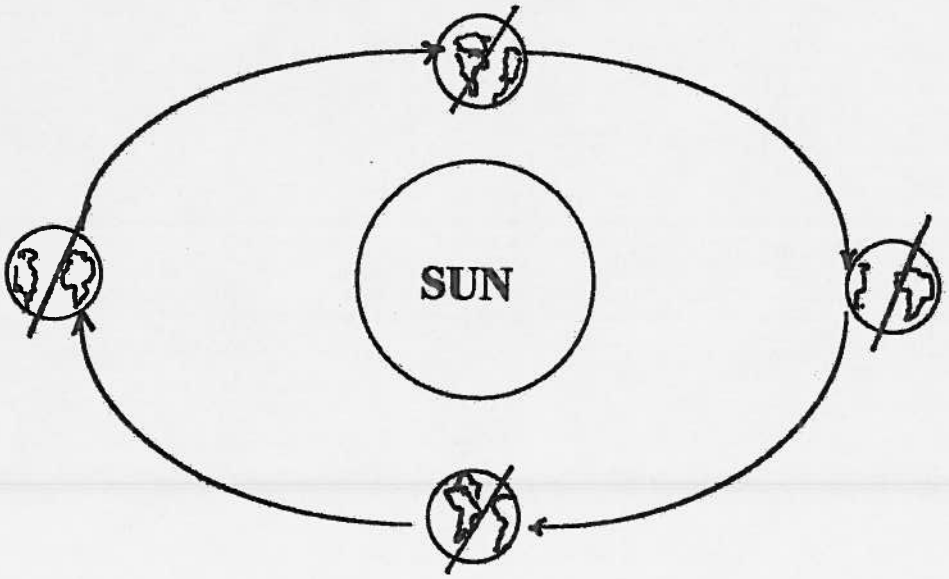
Date: _____

Reasons For The Seasons – Sun's Position and Heating Effect





Seasonal Changes.



What do we mean when we say there are four seasons ?

Why do we have four seasons ?

The moving of the earth around the sun is what causes seasonal changes.

On earth we have four seasons :

I. **Summer**

II. **Fall**

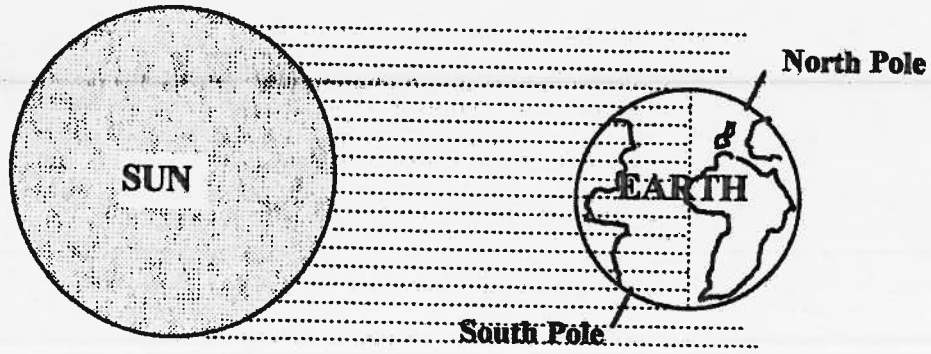
III. **Winter**

IV. **Spring**

From the diagram on the previous page you will see that as the earth moves around the sun, part of the earth is tilted toward the sun for part of the year. The countries tilted toward the sun have long days and short nights. This part of the earth is experiencing summer.

Where the countries tilt away from the sun, they experience short days and long nights and have winter.

However where the earth axis is not tilted toward or away from the sun, the days and nights are of equal length and this is when we have spring and fall.



A Year.

The earth takes 365 1/4 days to move around the sun (orbit around the sun) this makes up **1 year.**

Every 4 years we have what we call a leap year. The earth takes an extra day to orbit the sun, this day falls on the 29th day of February. On a leap year we have 366 days. During a regular year we have 365 days.

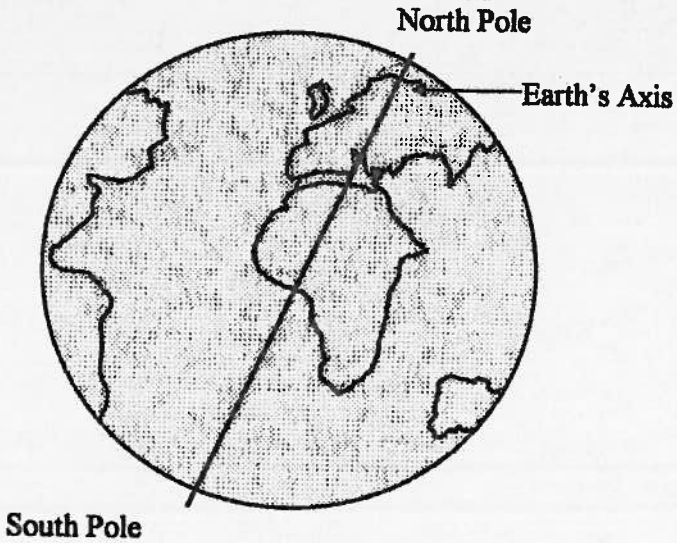
Note : Each planet takes a different length of time to circle the sun, therefore a year is different for each planet.

Mercury is closer to the sun than earth and it only takes 88 days to complete the full orbit (a year).

Pluto is much further away, it takes Pluto 248 years on Earth to orbit the Sun.

What causes day and night ?

The **earth's axis** is an imaginary line that stretches from the **north pole** to the **south pole.**



The earth spins on its axis and this spinning we call **rotation.** The earth rotates once every 24 hours causing 1 day. Daytime is 12 hours, night time is 12 hours.

The side of the earth facing the sun experiences daylight, - the opposite side experiences darkness.

When it is daytime in Canada and North America, it is night time in Australia.

The earth spins towards the east and this is why it looks as if the sun rises in the east and sets in the west.

Activity.

Shine a flashlight on a globe in a darkened room and slowly turn the globe around .

1. Which side of the globe has daylight ?

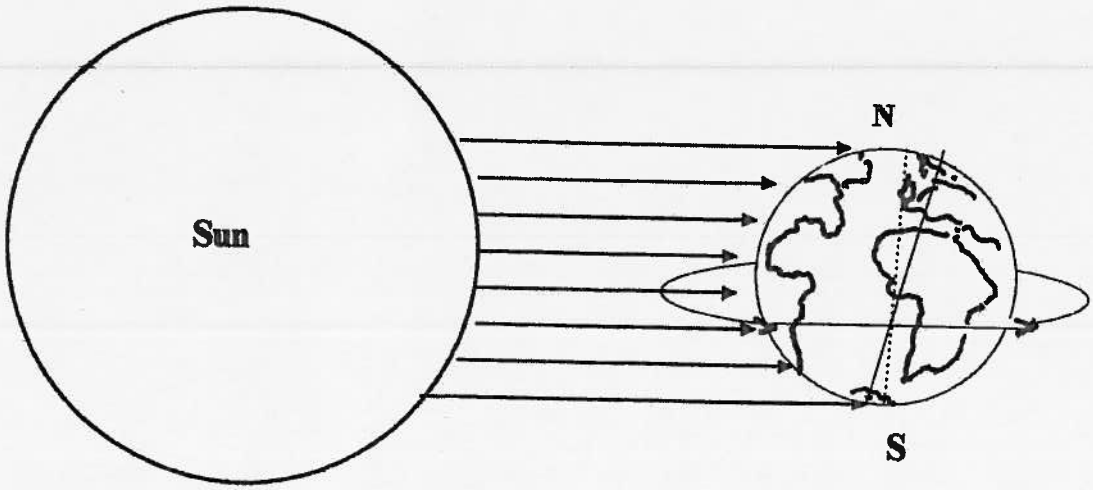
_____

_____

2. Which side of the globe has night ?

_____

_____



Activity.

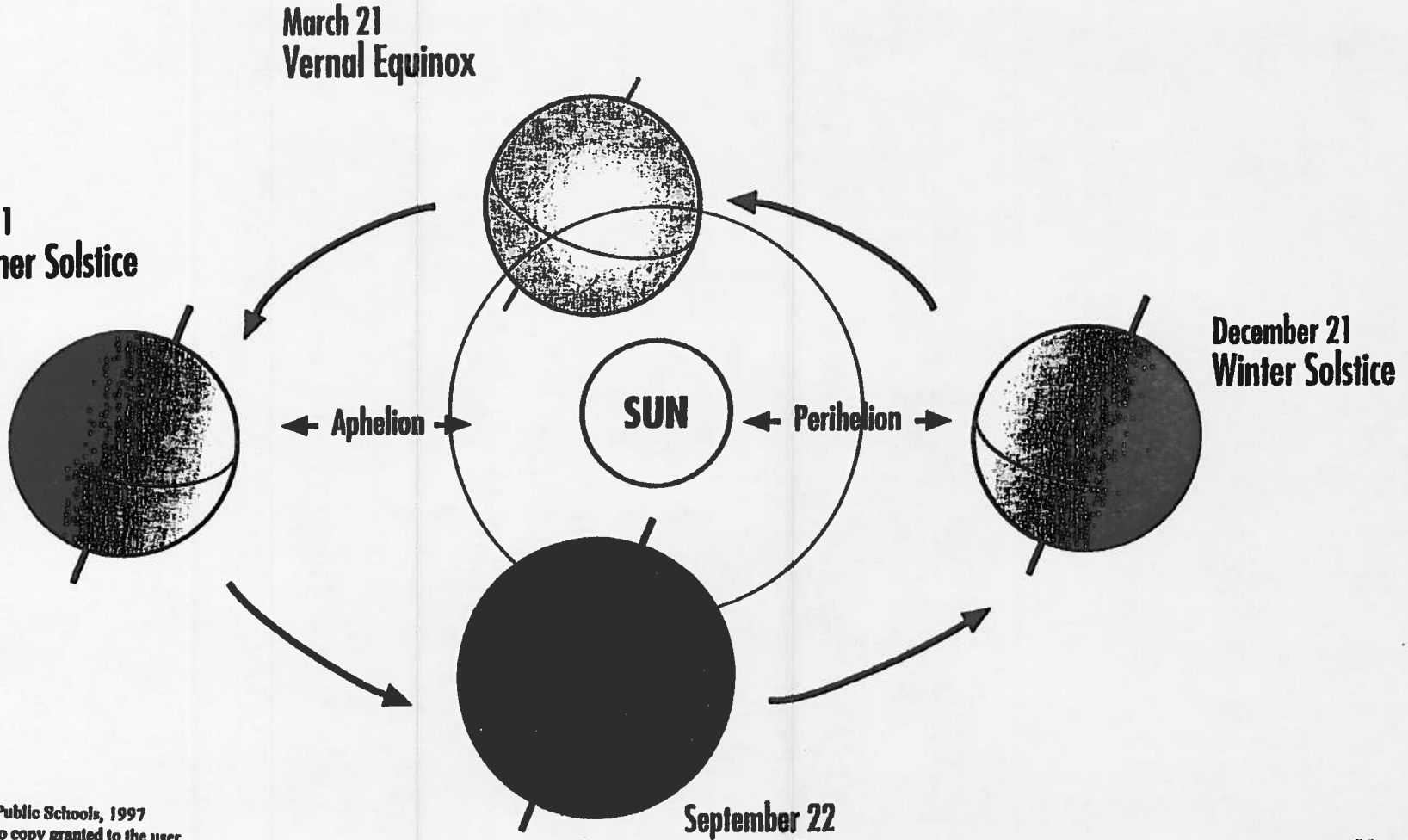
Observe a globe and slowly spin it around. This is what is taking place when the earth is moving on its own axis causing day and night.

Name: _____

Date: _____

Master #12c

Reasons For The Seasons – Diagram

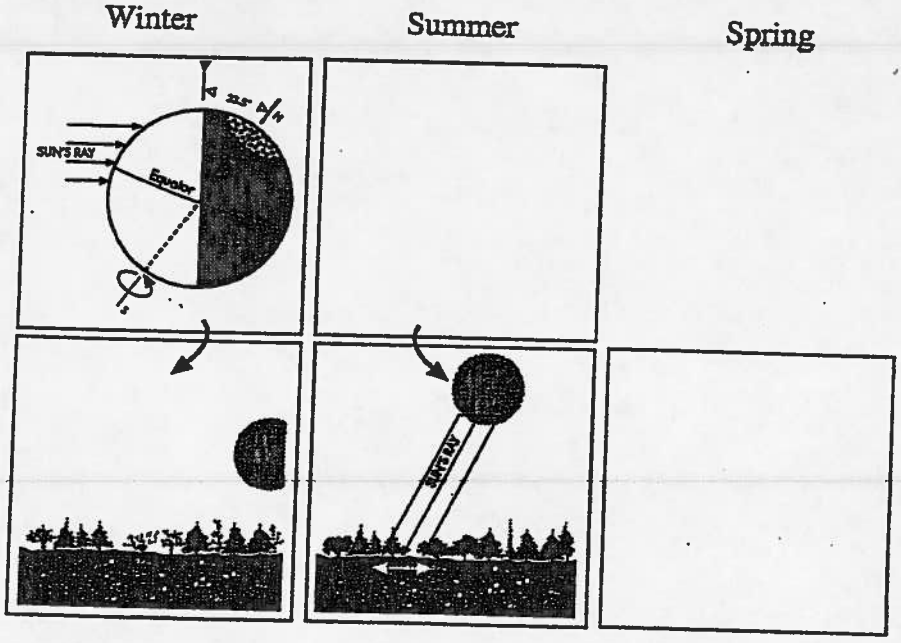


Task: Getting an Angle on the Seasons

Name: _____

Date: _____

1. Rashid was using pictures to help him explain the change of seasons in Canada. Finish the pictures for Winter and Summer. Predict and draw the appropriate pictures for Spring.



2. What would be the effect on the climate in Canada if the Earth was not tilted on its axis?

_____

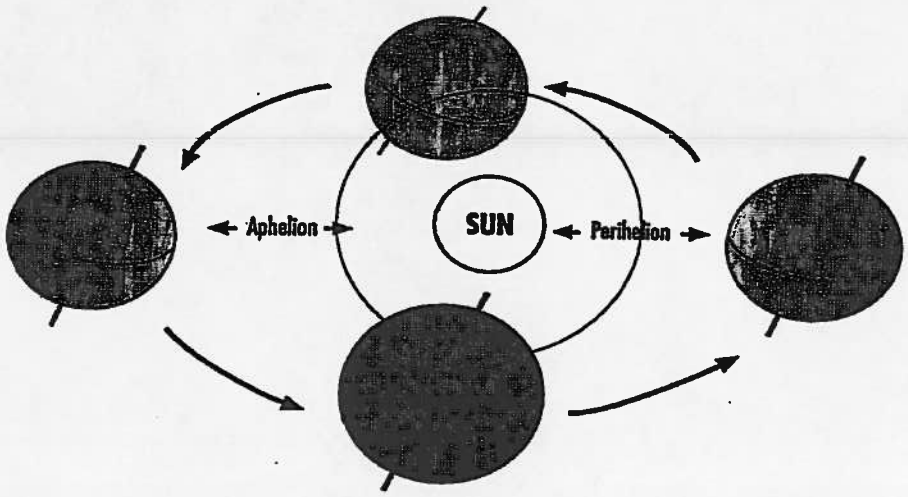
_____

_____

_____

3. In the following diagram, fill in the dates and the names that identify the seasonal changes. Draw Earth in its correct location as of today's date.

Terms to use:
summer
winter
spring
autumn
equinox
solstice



Explain why you placed Earth this way.

Name: _____ ***Master #13***

Date: _____

Introducing the Moon – KWL Chart

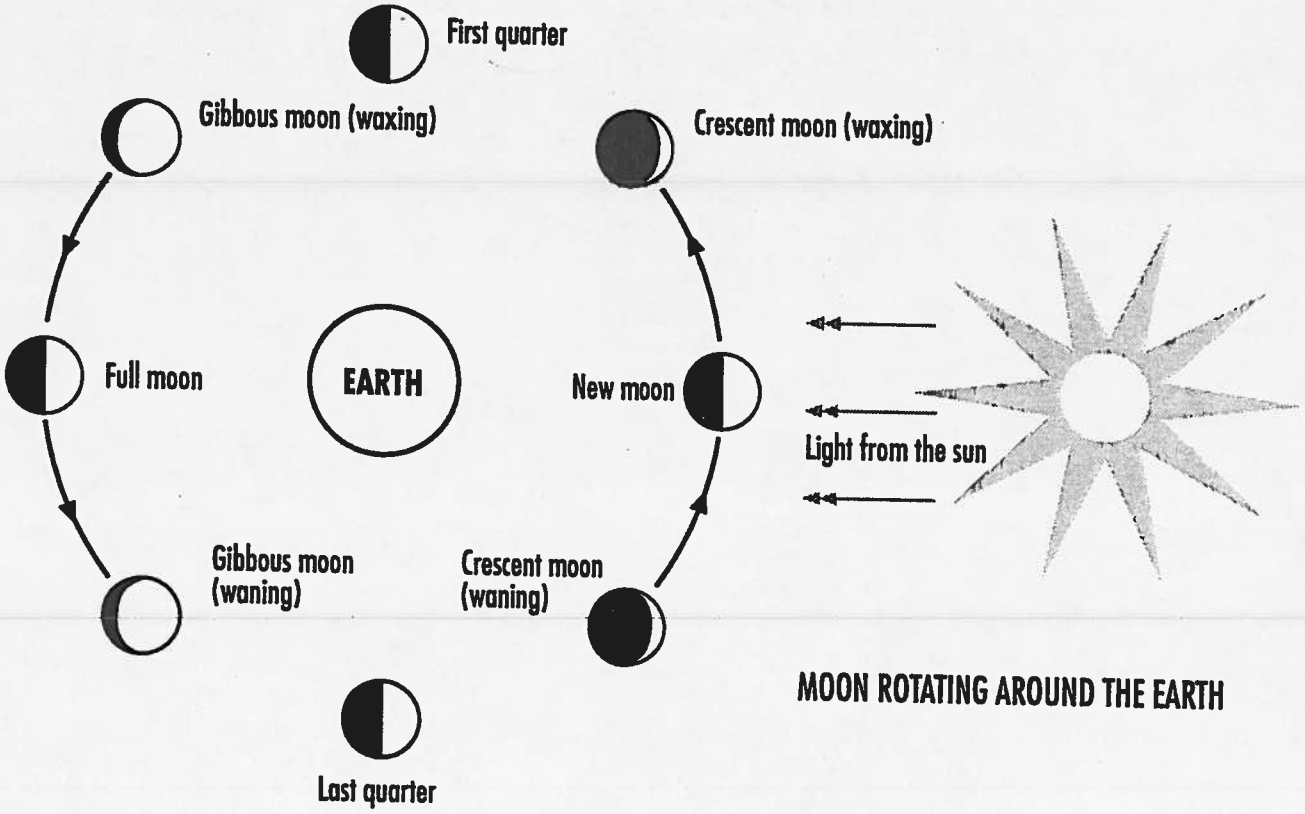
What I *Know*	What I *Want* to know	What I *Learned*

Name: _____

Date: _____

Master #14

Introducing the Moon



MOON ROTATING AROUND THE EARTH

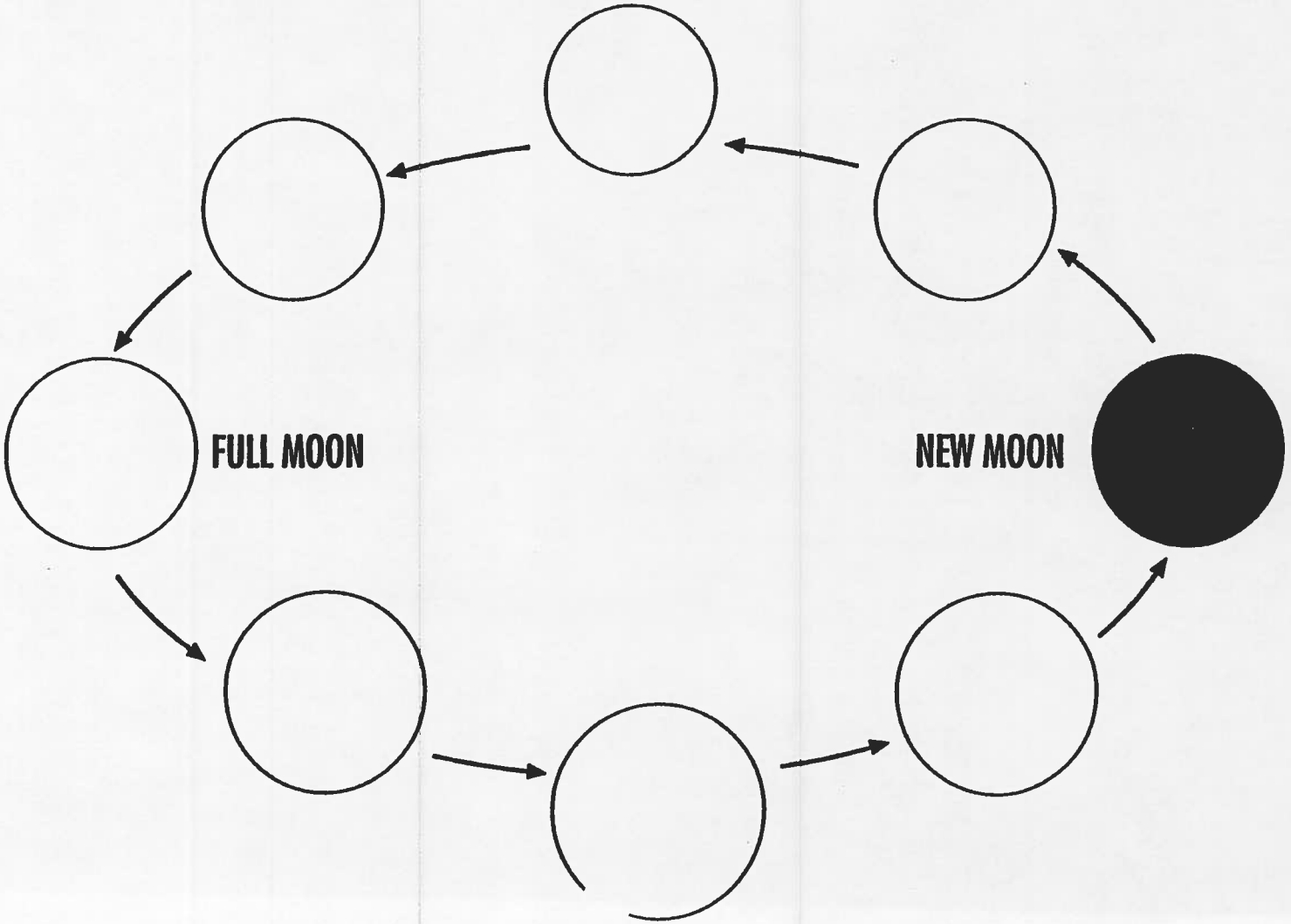
Name: _____

Date: _____

Master #15

The Phases of The Moon

Draw, colour and label the phases of the Moon.

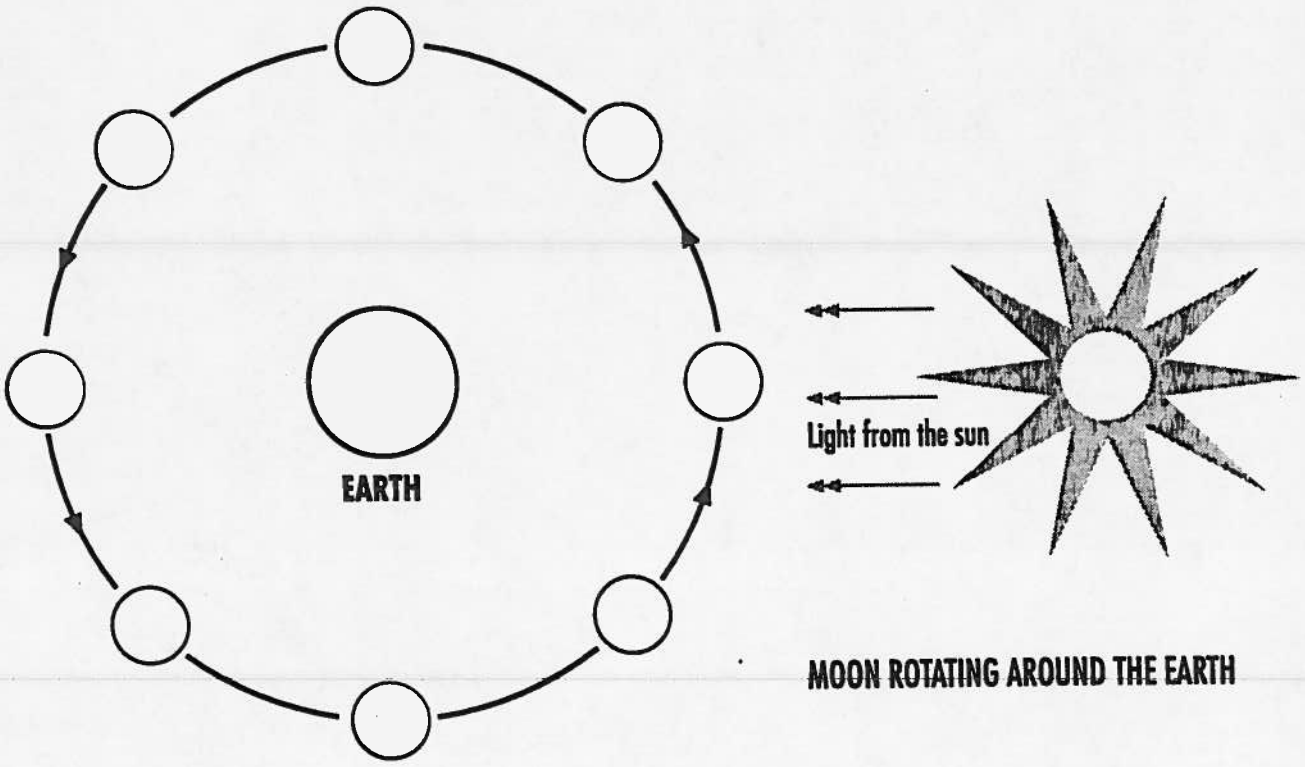


Name: _____

Date: _____

Master #18a

Moon Dance – Student Sheet



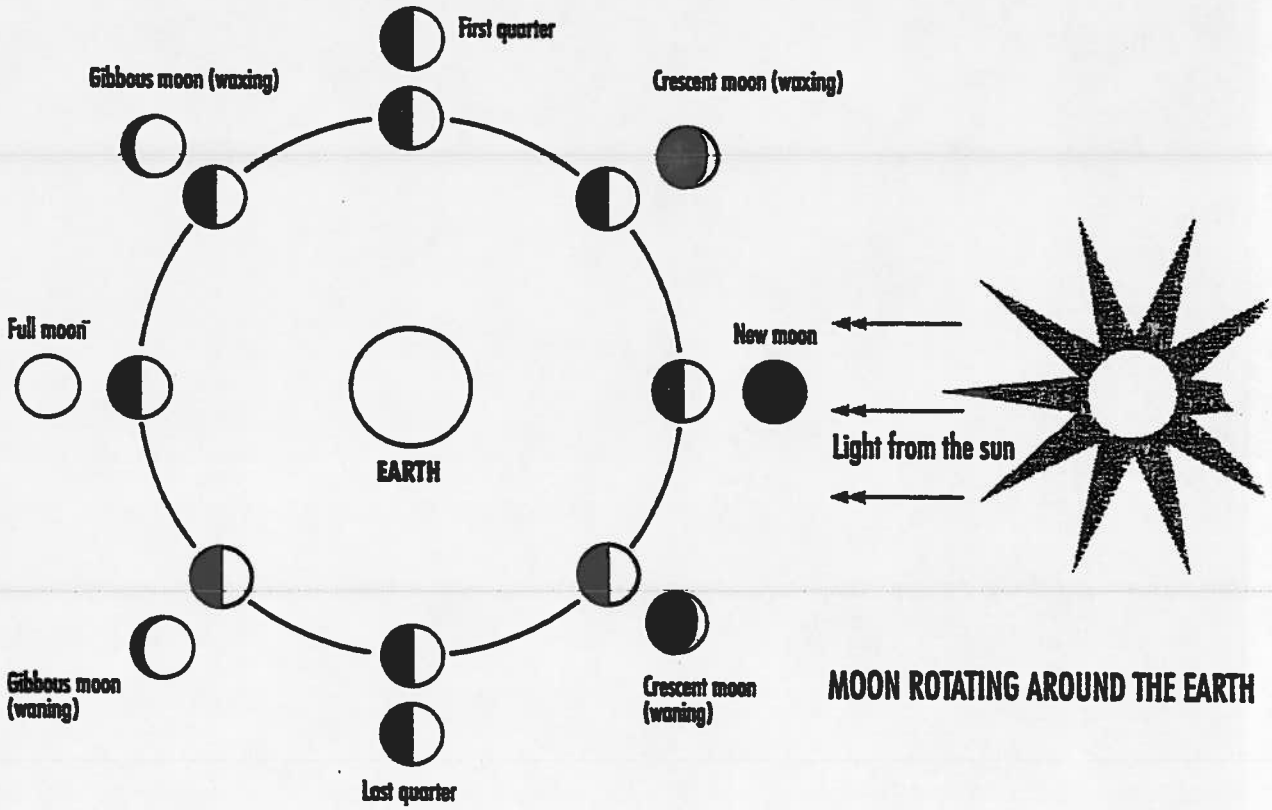
MOON ROTATING AROUND THE EARTH

Name: _____

Date: _____

Master #18c

Moon Dance – Putting It All Together



Task: **Moon Facts**

Name: _____

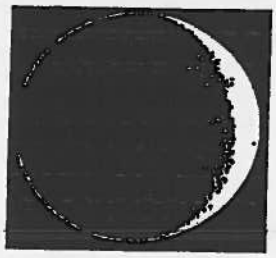
Date: _____

1. Tamara and Poon were planning a trip to a "haunted house" on Halloween. They were hoping that they would have lots of moonlight to help them see. If there was a new moon on September 28, would they have lots of moonlight on Halloween? Explain your answer.

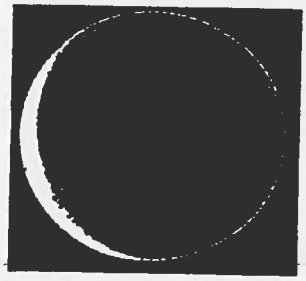
2. Four phases of the moon are illustrated below. Label each picture below with the correct term. Circle the picture of the moon phase that Tamara and Poon would most likely see on Halloween.

Terms: waxing crescent full new waning gibbous last quarter

a. _____ b. _____



c. _____ d. _____



Task: Moon News

Name: _____

Date: _____

Robin found this information about this week's sky in the weather section of the local newspaper.

Skies

Moonrise: 2:23 a.m. Sunrise: 5:14 a.m.
Moonset: 1:39 p.m. Sunset: 9:50 p.m.

Last Quarter today — New Moon next week

1. From this information, what can you infer about:

   a. the night sky in Robin's city this week? Explain your answer.

   _____

   _____

   _____

   b. the season of the year in Robin's city? Explain your answer.

   _____

   _____

   _____

2. Use the information from the diagram to:

   a. infer what the moon looked like in Robin's area 5 to 7 days before this newspaper was published.

   _____

   _____

   b. predict what the moon will look like in Robin's area 10 to 14 days after this newspaper was published.

   _____

   _____

3. Help Robin create a sunrise or sunset table for the week before the Spring Equinox (March 21). An example of the data to include might be:

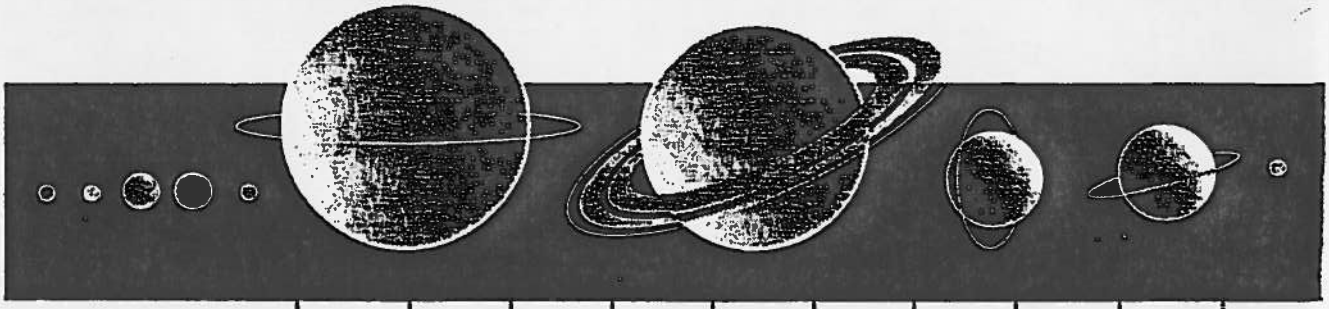
   Sunrise March 20, 1998 6:36 a.m.

Name: _____

Planet Research Sheet						
Name of Planet	Distance from the sun	Period of Revolution	Moons	Rings	Made of:	Other unique characteristics / colour

SOLAR SYSTEM STATISTICS

Master #2



CATEGORIES	Sun	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
1. Mean Distance From Sun (millions of Kilometers)	—	57.9	108.2	149.6	227.9	778.3	1,427	2,871	4,497	5,914
2. Period of Revolution	—	88 days	224.7 days	365.3 days	687 days	11.86 years	29.46 years	84 years	165 years	248 years
3. Equatorial Diameter (Kilometers)	1,390,000	4,880	12,100	12,756	6,786.8	143,200	120,000	51,800	49,528	2,:
4. Atmosphere (Main Componenets)	Hydrogen Helium	Virtually none	Carbon Dioxide	Nitrogen Dioxide	Carbon Dioxide	Hydrogen Helium	Hudrogen Helium	Helium Hydrogen Methane	Hidrogen Helium Methane	Methc +?
5. Moons	—	0	0	1	2	16	18	15	8	1
6. Rings	—	0	0	0	0	3	1,000(?)	11	4	0
7. Inclination of Orbit to Ecliptic	—	7°	3.4°	0°	1.85°	1.3°	2.5°	0.8°	1.8°	17.1
8. Eccentricity of Orbit	—	.206	.007	.017	.093	.048	.056	.046	.009	.24E
9. Rotation Period	26.8 days	59 days	243 days retrograde	23 hours 56 min.	24 hours 37 min.	9 hours 55 min.	10 hours 40 min.	17 hours 12 min.	16 hours 7 min. retrograde	6 day 9 hou 18 m retrogr
10. Inclination of Axis	7.25°	Near 0°	177.2°	23° 27'	25° 12'	3° 5'	26° 44'	97° 55'	28° 48'	120

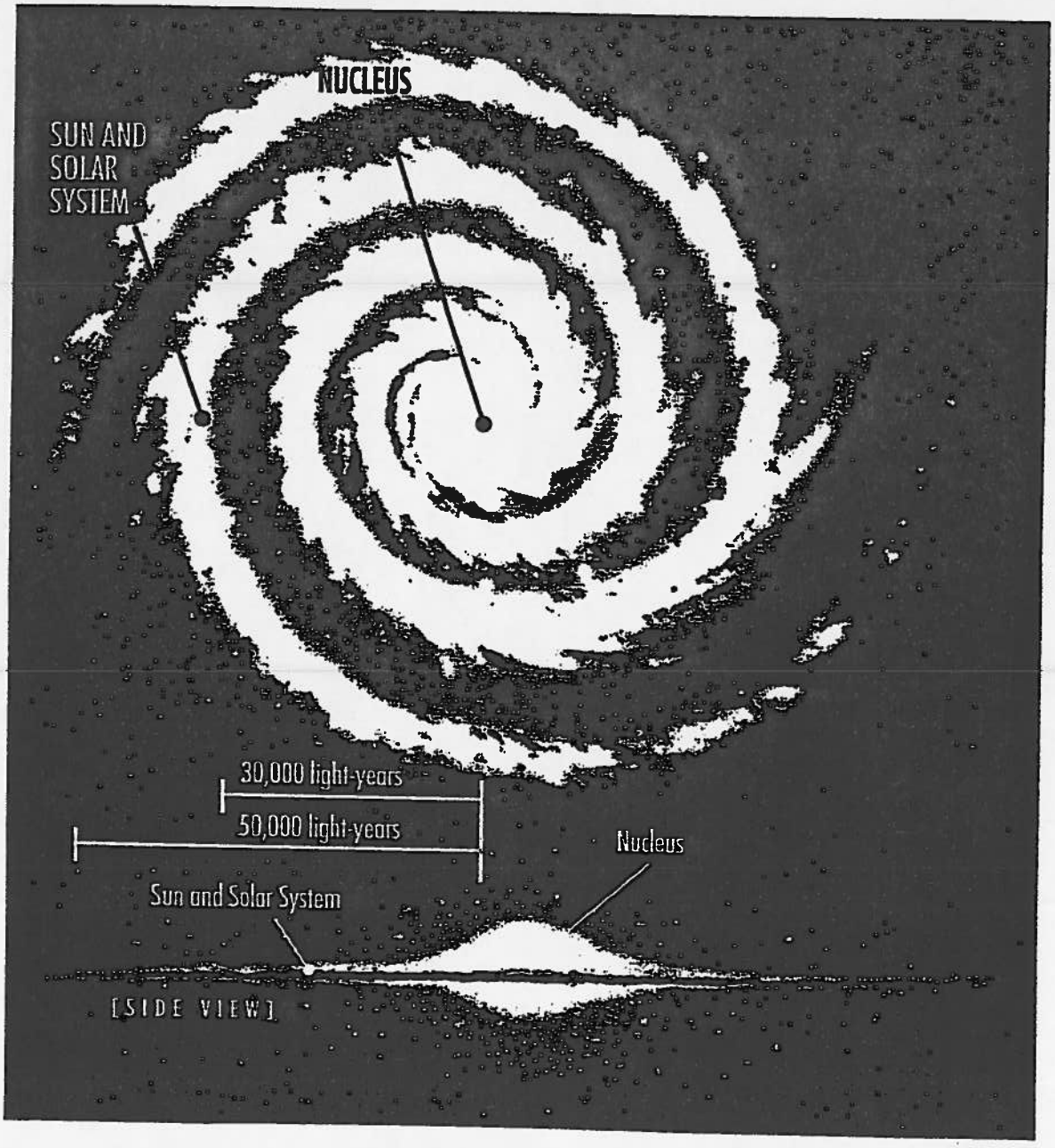
Inclinations greater than 90° imply retrograde rotation.

Name: _____

Master #23

Date: _____

Spiral Galaxies



40

Task: Fact-Finding Mission to Planet X

Name: _____

Date: _____

You have been chosen for a fact-finding mission to a newly-discovered planet hidden in the Asteroid Belt between Mars and Jupiter. As you get ready for this exciting space voyage, consider what information, questions and equipment you will need for a successful mission.

1. List five basic facts your team will need to consider about this new planet before the voyage begins.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

2. List five questions that your team might want to investigate on this new planet.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

3. Considering the information you know about this planet and the questions you will be investigating, list five items your team will need to take with them and explain why it would be important to have this equipment on the new planet.

a. _____

_____

_____

b. _____

_____

_____

c. _____

_____

_____

d. _____

_____

_____

e. _____

_____

_____

Task: Fact-Finding Mission Part Two

Name: _____

Date: _____

The recent Galileo probe has given us much new information about the satellites of Jupiter.

Read the following fact sheet on Callisto, the second largest satellite of Jupiter.

Callisto is the second largest satellite of Jupiter. Callisto is also the third largest satellite in our Solar System and is about the same size as Mercury. Callisto is the most heavily- cratered satellite in the Solar System. Its crust is very ancient and dates back four billion years, just shortly after the Solar System was formed.

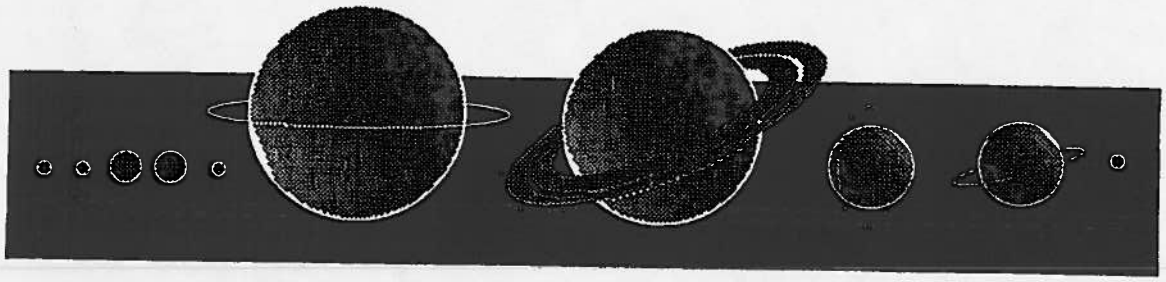
Callisto lacks any large mountains. This is due to a lack of geological activity like plate techtonics. Craters and ridged circles ringing the craters are the main geological features on Callisto. The largest craters have been erased by the flow of the icy crust over billions of years. The satellite has a bright central region that is 600 kilometers in diameter, and its rings extend to 3000 kilometers in diameter.

Callisto has the lowest density of the Galilean satellites. It is probably made of a large rocky core surrounded by water and ice, giving it a dark color. The satellite is composed of approximately equal proportions of ice-water and rock. Meteorites have made holes in the crust, causing water to spread over the surface and form bright rays and rings around the craters. Callisto has no known atmosphere.

Discovered by	Marius & Galileo Galilei
Date of discovery	1610
Mass (kg)	1.08e + 23
Equatorial radius (km)	2 400
Mean distance from Jupiter (km)	1 883 000
Rotational period (days)	16.68902
Orbital period (days)	16.68902
Mean orbital velocity (km/sec)	8.21
Orbital eccentricity	0.007
Orbital inclination (degrees)	0.281
Gravity (G*)	1/8

*G = force of gravity on Earth

1. Use this information to complete the attached Venn diagram. Compare and contrast Jupiter's Callisto with the Earth's Moon.



2. You have an opportunity to live on the Moon or on Callisto. Where would you choose to live? Why?

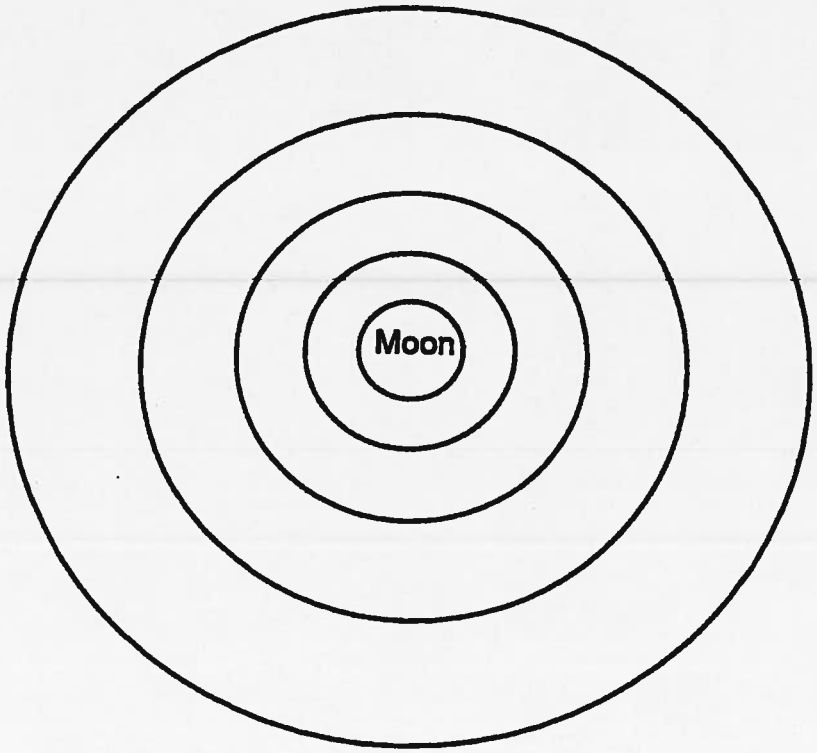
Task: **Size of the Universe**

Name: _____

Date: _____

1. Put the proper term in the correct circle. (The terms should go from *smallest* to *largest*.)

Terms				
Solar System	Universe	Earth	Sun	Galaxy



2. Complete the following topic sentence. Complete the paragraph with specific details about the size of the universe.

The universe is so big that _____

Task: Postcard From Space

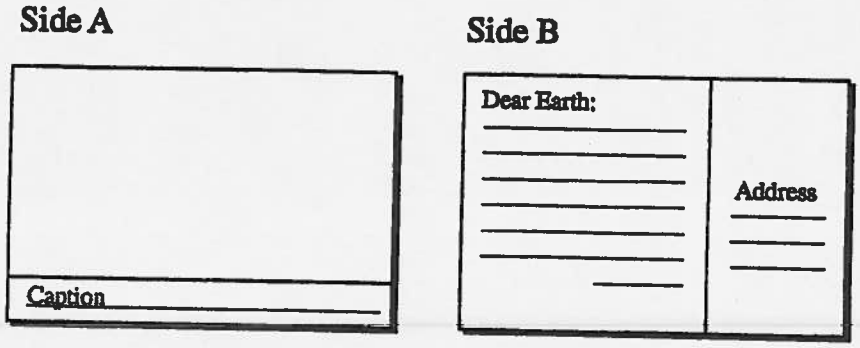
Name: _____

Date: _____

You are on the first mission to orbit in a space station around the planet _____. As the chief communication officer, your job is to design and write a postcard to send back to the people of Earth.

Side A of the postcard should include a picture or a design that communicates important information about this planet.

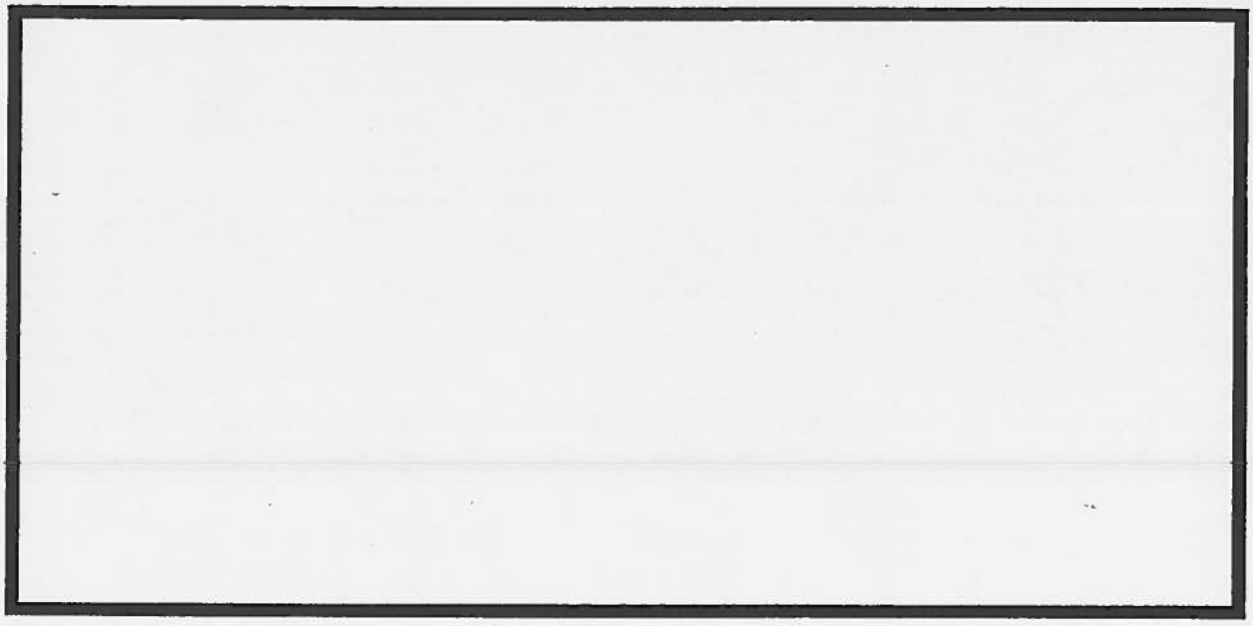
Write a caption on the bottom of the picture to help explain the illustration.

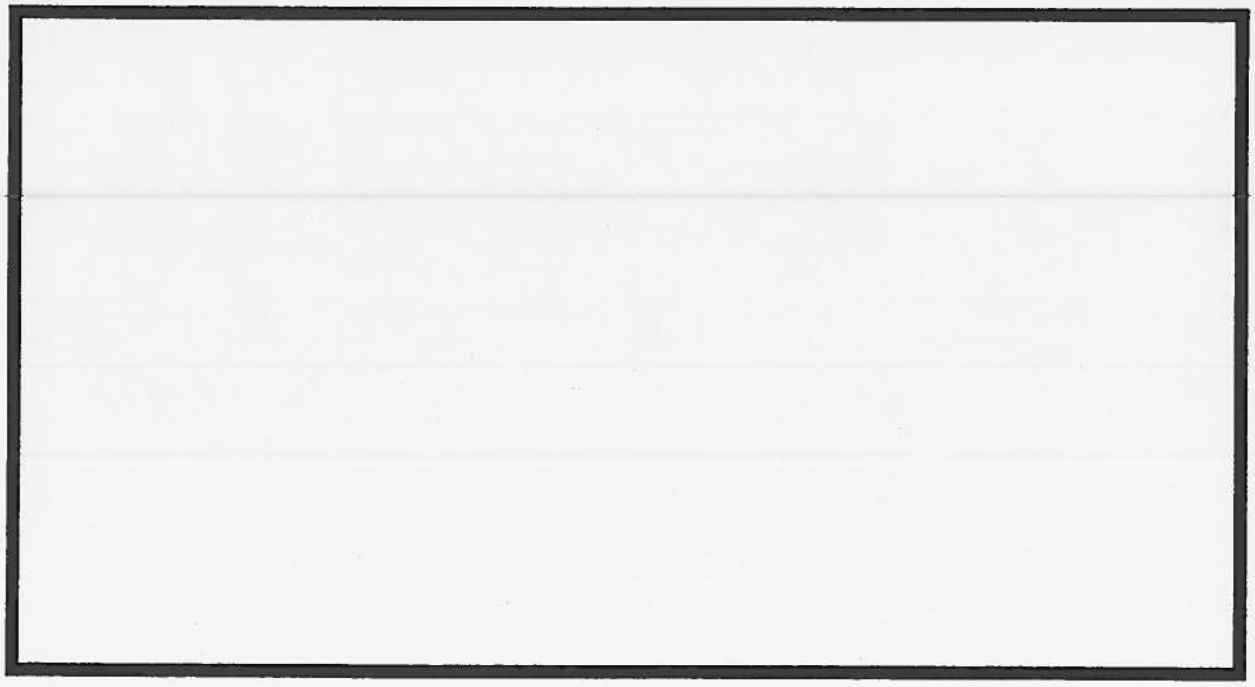


On the reverse side of the postcard write a message to the people of Earth. Describe your experiences as you orbit this planet and report new information your mission has discovered and questions you are investigating.

Address this postcard to an Earth person who is important to you. Be sure to include the complete address that it would need to navigate the intergalactic postal system.

Task: Postcard - Side A





Task: Postcard - Side B

Dear Earth:

Address:

Dear Earth:

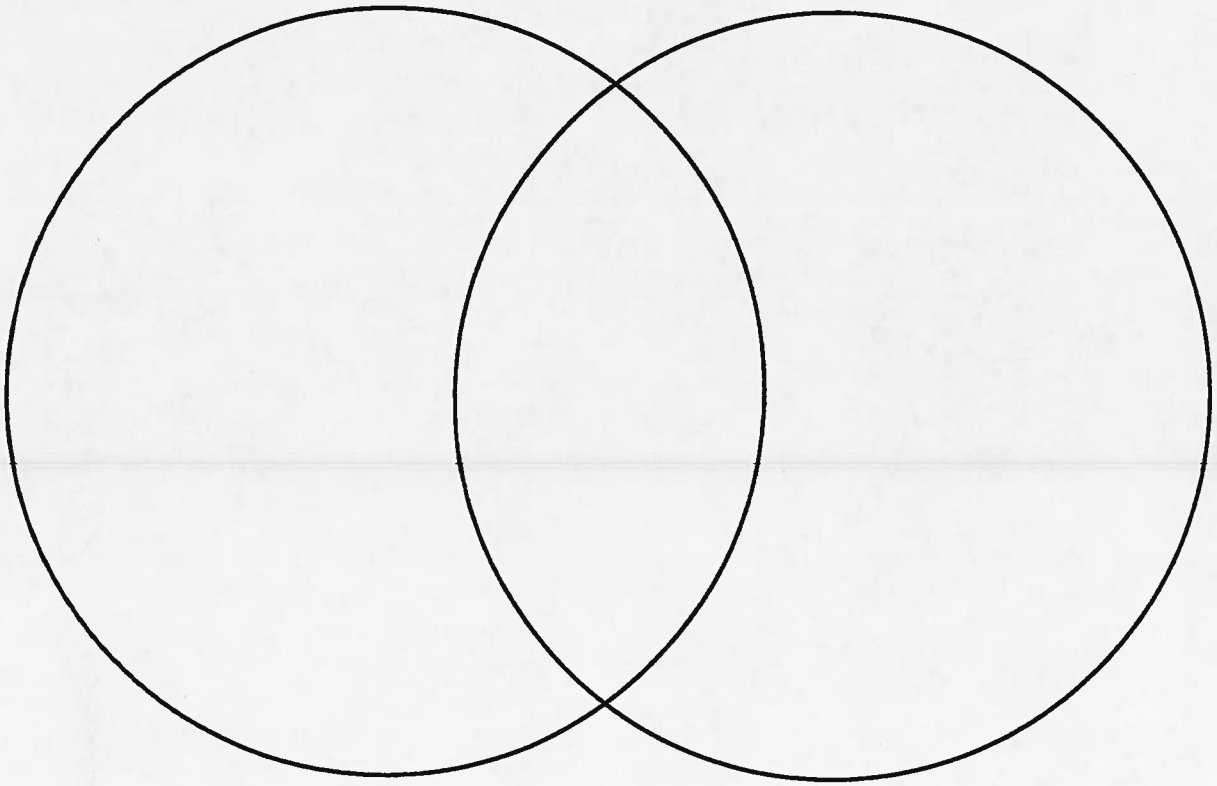
Address:

Title: _____

DIFFERENCES

SIMILARITIES

DIFFERENCES



_____ Name of Satellite

_____ Planet

_____ Name of Satellite

_____ Planet

Sources of information on Earth's Moon:

_____

_____

_____

_____

_____

Life On Other Planets

Task: You will design an alien that has adapted itself in order to survive on a planet of your choice. The alien must be able to meets its basic needs on the planet (this means that its physical build and inner self must be built in order for it to fulfill all needs).

You Need:

- ✓ **A Coloured drawing of your alien on 8 1/2 x 11 paper**
- ✓ **A detailed description of your alien that describes what adaptations were made and why**

Suggestion: Create a list of basic survival needs after you have gathered all information about your planet. Then decide how an alien would need to adapt itself in order for his/ her basic needs to be met.

Example: An alien from Pluto might be very hairy. This would help the alien stay warm because it is very cold in Pluto.

DUE DATE:

Task: **Planetary Prosperity**

Name: _____

Date: _____

It is 2897. The Solar System has been extensively explored, and all the planets and many satellites have large habitats in which thousands of people live and work. Since interplanetary travel has become inexpensive and fast, many people on Earth are interested in moving to new places in the Solar System.

You own a large business on one of the planets. Develop a brochure that would persuade people that your location would be an excellent place for them to live and work. Include a picture of the planet, a description of the lifestyle and comforts that have been developed. You may want to include information about the scenery and adventures that could be experienced. (Be sure that everything you include is plausible and based on the characteristics of that planet.) Gather information about your planet from library, CD-ROM, and Internet resources.

Planet chosen: _____

Bibliography of resources:

_____

_____

_____

_____

_____

_____

_____

Alien Art Project

Drawing	Alien is neatly drawn, labeled and colour. Artist paid close attention to detail.	Alien is not coloured, drawn or labeled, neatly (one component). Attention to detail is not evident.	Alien is not coloured, drawn or labeled, neatly (2 or more components). Attention to detail is not evident.
Physical Needs	At least 5 descriptors are given as to how the alien meets its physical needs.	3-4 descriptors are given as to how the alien meets its physical needs.	Less then 3 descriptors are given as to how the alien meets its physical needs.
Social Needs	At least 5 descriptors are given as to how the alien meets its social needs.	3-4 descriptors are given as to how the alien meets its social needs.	Less then 3 descriptors are given as to how the alien meets its social needs.
Physiological Needs	At least 5 descriptors are given as to how the alien meets its physiological needs.	3-4 descriptors are given as to how the alien meets its physiological needs.	Less then 3 descriptors are given as to how the alien meets its physiological needs.
Spelling and Grammar	No spelling or grammar mistakes	3 or less spelling mistakes	3 or more spelling mistakes

In your brochure you must include:

- Pictures of your planet /2
- A chart that compares colour, size, gravity, length of day and year, temperature and amount of satellites /10
- Details on what tourists need to bring (oxygen, warm or cold clothes, and anything else they might need during their stay) /10
- Brochure must be neat and contain NO spelling mistakes. *** This means that you must have an adult edit for spelling before handing it in. /5
- A list of activities and points of interest that tourists would be interested in. /3