Word	Definition	Pic / Example or Int. fact
equator	an imaginary east-west line through the center of Earth dividing it into 2 hemispheres (not so.)	
axis	imaginary line the Earth rotates on	
hemisphere	half of the Earth	
Prime Meridian	an imaginary north-south line that divides the Earth into East-West hemisheres	
Tropic of Cancer	horizontal line above (north) the equator	
Tropic of Capricorn	imaginary horizontal line below (south) of the equator	

Word	Definition	Pic / Example or Int. Fact
rotation	the turning or spinning of the Earth on its axis. (24 hrs.)	
revolution	one complete rotation of the Earth around the sun (1yr - 365 days)	
leap year	a year that has 1 more day than normal (366 days) every 4 yrs.	
summer solstice	when more than half the Northern Hemisphere has light	
winter solstice	when less than half the Northern Hemisphere has sunlight	
vernal equinox	marks the beginning of Spring (March 21) day + night are = or same amount of hrs.	
autumnal (fall) equinox	marks the beginning of fall - day + night are = or same amount of hrs. (Sept. 21-22)	

Name _____ Date _____ Class _____

SECTION 1-1 SECTION SUMMARY

Earth in Space

Guide for Reading

- What causes day and night?
- What causes the cycle of seasons on Earth?

The study of the moon, stars, and other objects in space is called **astronomy.** Ancient astronomers studied the movements of the sun and moon. They thought Earth was standing still and the sun and moon were moving. The sun and moon seem to move mainly because Earth is rotating on its axis. The imaginary line that passes through Earth's center and the North and South poles is called Earth's **axis.** The spinning of Earth on its axis is called its **rotation. Earth's rotation on its axis causes day and night. It takes Earth about 24 hours to rotate once on its axis.**

The movement of one object around another object is called **revolution.** Earth completes one revolution around the sun once every year. Earth's path as it revolves around the sun is called its orbit. Earth's orbit is a slightly flattened circle.

Many cultures have tried to make a workable calendar. This is not easy because Earth takes about 365 1/4 days to circle the sun and 12 moon cycles make up fewer days than a year.

Sunlight hits Earth's surface most directly at the equator. Closer to the poles, sunlight hits Earth's surface at an angle. That is why it is warmer near the equator than near the poles.

Earth has seasons because its axis is tilted as it moves around the sun. Earth's axis is tilted at an angle of 23.5° from vertical. As Earth revolves around the sun, its axis is tilted away from the sun for part of the year and toward the sun for part of the year. When the north end of Earth's axis is tilted toward the sun, the Northern Hemisphere has summer. At the same time, the south end of Earth's axis is tilted away from the sun. As a result, the Southern Hemisphere has winter. The hemisphere tilted toward the sun has more daylight hours than the hemisphere tilted away from the sun. The combination of direct rays and more hours of sunlight heats the surface more than at any other time of the year. In June, the north end of Earth's axis is tilted toward the sun.

Latitude is a measurement of distance from the equator, expressed in degrees north or south. On two days each year, the noon sun is overhead at either 23.5° north or south. Each of these days is known as a **solstice.** About June 21, the noon sun is directly overhead at 23.5° north latitude. Halfway between the solstices, neither hemisphere is tilted toward the sun. On those two days, the noon sun is directly overhead at the equator. Each of these days is known as an **equinox,** meaning "equal night." During an equinox, the length of nighttime and daytime are about the same. The **vernal equinox,** or spring equinox, occurs around March 21, marking the beginning of spring in the Northern Hemisphere. The **autumnal equinox** occurs about September 23, marking the start of fall in the Northern Hemisphere.

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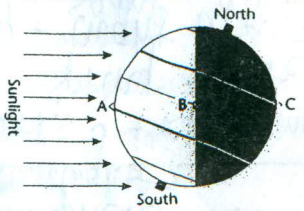
Name _____ Date _____

SECTION 1-1 REVIEW AND REINFORCE

Earth in Space

◆ Understanding Main Ideas

Use the following figure to answer questions 1 through 3. Write your answers on the back of this page or on a separate sheet of paper.



1. In the diagram, what season is it in North America? winter
2. Would a person at each of the points A, B, and C see the sun? If so, where would the sun be in the sky? A ~~Horizon~~ Overhead B horizon, C not visible
3. Which is a person standing at point B seeing, sunrise or the sunset? Explain. Sunset Earth rotates west to east counterclockwise turning (night) from sun

◆ Building Vocabulary

Match each term with its definition by writing the letter of the correct definition in the right column on the line beside the term in the left column.

D	4. astronomy	a. The path of Earth as it revolves around the sun
I	5. axis	b. Occurs in September and marks the beginning of fall in the Northern Hemisphere
G	6. rotation	c. Occurs in March and marks the beginning of spring in the Northern Hemisphere
F	7. revolution	d. The study of the moon, stars, and other objects in space
A	8. orbit	e. The sun is directly overhead at 23.5 degrees north or south at this time.
J	9. latitude	f. Movement of Earth around the sun
H	10. equinox	g. Movement of Earth around its axis
E	11. solstice	h. The sun is directly overhead at the equator at this time.
C	12. vernal equinox	i. Line passing through Earth's center and poles
B	13. autumnal equinox	j. A measurement of distance from the equator, expressed in degrees north or south

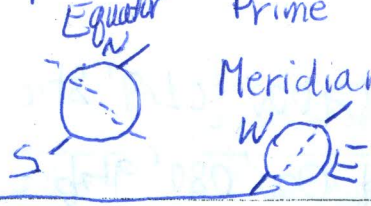
Name

Earth & Its Cycles:

How many hemispheres is Earth divided into at any one given time?

hemi = 1/2

2



One complete rotation of Earth on its axis is equal to 1 day

1 day = 24 hrs.

Are all *days* the same length of time? Support your answer.

yes, 24 hrs.
The amt. daylight can vary

Why are the # of hours of sunlight and darkness in the No. and So. Hemispheres not constant?

Earth is tilted / not straight up + down / hemisphere leans toward sun = long days + short nights

The Earth rotates in a (1) direction---that is from (2) to (3).

① counterclockwise
② west
③ east

The Earth rotates on its axis at a #° slant (tilt).

23½° or 23.5°

If the Earth's axis were straight up and down (not titled), what would happen to the amount of sunlight at each pole all year long?

- All parts of Earth would have about 12 hrs. sunlight and 12 hrs. darkness...
- no seasons

What would Earth be like if the Earth did not rotate on its axis?

Some places would have all daylight vs. some places having all darkness

The rotation and revolution of the Earth are responsible for _____ and _____ and _____.

day and night
seasons (or year)

Why do some planets not experience seasons? ex.

Not all planets are tilted on an axis.

Mercury, Venus, Jupiter

One complete revolution of Earth around the sun is equal to _____.

365.25 days a year

Why do leap years occur every 4 years?

~ 365 1/4 days = 1 revolution

$\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=1$

leftover days (portions) 1 year

Feb. 29

What do the words solstice and equinox mean? How are they related to the position of the Earth's axis?

N/S poles are full tilt at 23½°

solstice = sun stop

N/S... direct rays @ tropics

vs. not tilted toward sun... incoming (rays) @ equator.

equinox = equal night

How does the tilt of the Earth's axis, combined with the earth's revolution, cause the occurrence of the seasons?

summer or winter

Poles leaning toward or away from sun

vs.

poles not leaning

spring or fall

During the autumnal equinox, the sun's direct rays shine on the ____. Describe this day in terms of daylight and darkness.

equator Approx 12 hrs. sunlight and 12 hrs. darkness

They are of equal length.

The vernal equinox is the first day of Spring

The day when the North Pole is tilted a full 23.5 degrees toward the sun is the Winter Solstice. Describe this day in terms of daylight and darkness.

the shortest day of the year in Northern Hemisphere and longest day of the year in Southern Hemisphere.

True or False? Summer and winter are not affected by the Earth's distance from the sun. Support your answer.

The seasons depend on the tilt, not the distance.

Earth is at its farthest distance from sun in its elliptical orbit when we have summer.

Today, is the No. hemisphere leaning toward or away from the sun? How do you know?

Each day we are leaning more toward the sun because we are approaching the June summer solstice.

Math Connection-use a calculator.
If Earth moves at a speed of approximately 30km/sec as it orbits the sun....
What is the distance, in km, does Earth travel

- in one minute? $30 \times 60 = 1800$ Km
- in one hour? $1800 \times 60 = 108,000$ Km
- in one day? $108,000 \times 24 = 2,592,000$ Km
- in one year? $2,592,000 \times 365 = 946,080,000$ Km

leap year? 948,672,000 Km

Earth and Its Moon Name: Period:

Matching: On the line provided, write the letter of the term at the bottom that is most closely related to the phrase.

F 1. the imaginary line with 0 latitude
H 2. the imaginary line with 0 longitude
A 3. the surrounding air layer of Earth
J 4. one complete revolution of Earth around the sun
K 5. one complete rotation of Earth on its axis
B 6. result of radiation colliding with particles in Earth's atmosphere
D 7. imaginary lines running north and south
I 8. imaginary lines running east and west
M 9. a north-south section of Earth in which all clocks show the same time
C 10. Earth has 4 seasons due to its ...
E 11. Earth is divided into ...
L 12. Twice a year, the poles are tilted directly toward the sun
G 13. Twice a year, the poles are not tilted directly toward the sun

a. atmosphere
b. aurora
c. tilted axis and revolution
d. meridians
e. hemispheres (2)
f. equator
g. equinoxes
h. Prime Meridian
i. parallels
j. year
k. day and night (24 hours)
l. solstices
m. time zone