Name \_\_\_\_ Date \_\_\_\_

Earth Movements 🡪 Two Major Earth Motions:

R\_\_\_\_

* Earth spins \_\_\_\_ at a rate of about 1,000 mph
* It takes \_\_\_\_ hours (1 day) for the Earth to make a complete rotation.

R\_\_\_\_ (orbit)

* Earth revolves around the sun at about \_\_\_\_ mph.
* It takes \_\_\_\_ ¼ days (1 year) for the Earth to make one complete revolution around the sun.



* The earth travels in an \_\_\_\_ orbit, (all planets do) meaning that the distance between the sun and the earth changes.
	+ \_\_\_\_ – the point in the earth’s orbit when it is farthest away.
	+ \_\_\_\_ – the point in the earth’s orbit when it is closest to the sun.

Label the names

* + The Earth is \_\_\_\_ to the sun on: \_\_\_\_ 3rd (perihelion)
	+ \_\_\_\_ on: \_\_\_\_ 4th (aphelion)

Evidence for Earth Revolution (Orbit)

* \_\_\_\_
* We see different constellations throughout the year called \_\_\_ \_\_\_.

Earth has \_\_\_\_ Seasons 🡪 Spring (vernal \_\_\_\_), Summer (summer \_\_\_\_), Autumn (autumnal \_\_\_\_), Winter (Winter \_\_\_)



Three reasons for the Seasons:

1. Earth’s Axial \_\_\_\_ – 23.5**°**
2. Earth \_\_\_\_ around the sun.
3. \_\_\_\_ – the earth’s axial tilt does \_\_\_\_ change throughout its orbit.

\_\_\_

* How direct, or indirect the sun \_\_\_\_ is.
* This will affect the \_\_\_ of energy received at a given location (which affects \_\_\_\_).

\_\_\_\_\_

* \_\_\_\_ days allow the sun to heat up the earth for a longer period of time (higher \_\_\_\_).



* \_\_\_\_ days allow a shorter period for the sun to heat up the earth (\_\_\_\_ temperature).

Earth’s tilt

– For \_\_\_\_ (in the northern hemisphere) the earth tilt’s \_\_\_\_ the sun.

– For \_\_\_ (in the northern hemisphere) the earth tilt’s \_\_\_\_ from the sun.

Path of the \_\_\_\_\_ (One Year) 🡪 position of the sun in the sky during the year.

\_\_\_\_ Solstice

* Sun “\_\_\_\_” (solstice)
* \_\_\_ day(s) of the year in the Northern Hemisphere
* The sun reaches its \_\_\_\_ point in the sky (“stops”) and then begins to \_\_\_\_.

\_\_\_\_ Solstice

* \_\_\_\_ “Stop” (solstice)
* \_\_\_\_ day(s) of the year in the Northern Hemisphere
* The sun reaches its \_\_\_\_ point in the sky (“stops”) and then begins to \_\_\_\_.

E\_\_\_\_

* During equinox “equal \_\_\_\_” (\_\_\_\_ & \_\_\_\_), the earth’s tilt does not play a role in the sun heating the earth.
* The sun is \_\_\_\_ at the \_\_\_\_.
* The length of \_\_\_\_ equals the length of night.

The \_\_\_\_ of the earth and the sun’s \_\_\_ indicate the season in the northern hemisphere.

M\_\_\_\_ Movements

* The moon rotates at about \_\_\_ mph – very slow when compared to the earth. The rotational speed of the moon is \_\_\_\_ to its orbital speed. Because of this we only see one side of the moon!!
* The moon revolves \_\_\_\_ around the earth.
* The amount of visible illumination on the moon’s surface makes up the “\_\_\_\_.”
* There are \_\_\_\_ major phases.
* As a result of the moon revolving around the earth, the moon goes through \_\_\_.
* Phases are times when different amounts of the moon are \_\_\_\_ from our view on Earth.
* At any time, half of the moon is light, and half is dark. Because of the moon’s \_\_\_\_, we may not be able to see the half that is lit.
* \_\_\_\_\_ means “growing” larger; \_\_\_\_ means “shrinking” smaller



Label:

Label:

* 1 earth rotation = \_\_\_\_\_ hrs = \_\_\_ day; one earth revolution = \_\_\_\_\_\_ days = \_\_\_ year;
* One Lunar revolution ~ \_\_\_\_\_ days

The Moon Causes T\_\_\_\_

* The moon has a \_\_\_\_ force on our planet, and in particular on the \_\_\_\_ surfaces of our planet.
* The side of the earth \_\_\_\_ the moon has \_\_\_\_ force acting on the water.
* The \_\_\_\_ also has gravitational “pull” on the earth (water)
* But the moon changes position each \_\_\_\_, causing its gravitational force to act in different directions at different times.

H\_\_\_\_ & L\_\_\_ Tides

* The times and amplitude of the tides at a locale are influenced by the alignment of the \_\_\_\_ and \_\_\_\_.
* Tides are commonly *\_\_\_\_\_\_-diurnal* (two high waters and two low waters each day), or *\_\_\_\_* (one tidal cycle per day).

S\_\_\_\_ Tides

* Times when the moon is \_\_\_\_ or \_\_\_\_ phase,
* Causing \_\_\_\_ high tides, and lower low tides.



N\_\_\_\_\_\_\_\_ Tides

* Times when the moon is in its \_\_\_\_\_\_\_\_\_\_\_ phases,
* Causing \_\_\_\_\_\_\_\_\_\_\_\_\_ tides (not so high, high tides, and not so low, low tides.)



ANSWERS



Earth has four Seasons 🡪 Spring (vernal equinox), Summer (summer solstice), Autumn (autumnal equinox), Winter (Winter solstice)

Three reasons for the Seasons:

1. Earth’s Axial Tilt – 23.5**°**
2. Earth revolves around the sun.
3. Parallelism – the earth’s axial tilt does not change throughout its orbit.

Solar Rays

* How direct, or indirect the sun angle is.
* This will affect the amount of energy received at a given location.

Solar Days

* The length of the days.
* Longer days allow the sun to heat up the earth for a longer period of time.



* Shorter days allow a shorter period for the sun to heat up the earth.

Path of the Sun (One Year) 🡪 position of the sun in the sky during the year.

Summer Solstice

* Sun “Stop” (solstice)
* Longest day(s) of the year in the Northern Hemisphere

Winter Solstice

* Sun “Stop” (solstice)
* Shortest day(s) of the year in the Northern Hemisphere

Equinox

* During equinox “equal nights” (Spring & Fall), the earth’s tilt does not play a role in the sun heating the earth.
* The sun is overhead at the equator.
* The length of day equals the length of night.

Earth Movements 🡪 Two Major Earth Motions:

Rotation

* Earth spins counterclockwise at a rate of about 1,000 mph
* It takes 24 hours (1 day) for the Earth to make a complete rotation.

Revolution (orbit)

* Earth revolves around the sun at about 67,000 mph.
* It takes 365 ¼ days (1 year) for the Earth to make one complete revolution around the sun.



* The earth travels in an elliptical orbit, (all planets do) meaning that the distance between the sun and the earth changes.
	+ Aphelion – the point in the earth’s orbit when it is farthest away.
	+ Perihelion – the point in the earth’s orbit when it is closest to the sun.
	+ The Earth is closest to the sun on: January 3rd (perihelion)
	+ Farthest on: July 4th (aphelion)

Evidence for Earth Revolution (Orbit)

* Seasons
* We see different constellations throughout the year called seasonal constellations.

Moon Movements

* The moon rotates at about 10 mph – very slow when compared to the earth. The rotational speed of the moon is equal to its orbital speed. Because of this we only see one side of the moon!!
* The moon revolves counterclockwise around the earth.
* The amount of visible illumination on the moon’s surface makes up the “phases.”
* There are 8 major phases.
* As a result of the moon revolving around the earth, the moon goes through phases.
* Phases are times when different amounts of the moon are lit from our view on Earth.
* At any time, half of the moon is light, and half is dark. Because of the moon’s position, we may not be able to see the half that is lit.
* Waxing means “growing” larger; Waning means “shrinking” smaller



* 1 earth rotation = 24 hrs = 1 day; one earth revolution = 365 days = 1 year;
* One Lunar revolution ~ 30 days

The Moon Causes Tides

* The moon has a gravitational force on our planet, and in particular on the water surfaces of our planet.
* The side of the earth opposite the moon has centrifugal force acting on the water.
* The sun also has gravitational “pull” on the earth (water)
* But the moon changes position each day, causing its gravitational force to act in different directions at different times.

High & Low Tides

* The times and amplitude of the tides at a locale are influenced by the alignment of the Sun and Moon.
* Tides are commonly *semi-diurnal* (two high waters and two low waters each day), or *diurnal* (one tidal cycle per day).

Spring Tides

* Times when the moon is full or new phase,
* Causing higher high tides, and lower low tides.



Neap Tides

* Times when the moon is in its quarter phases,
* Causing moderate tides (not so high, high tides, and not so low, low tides.)

