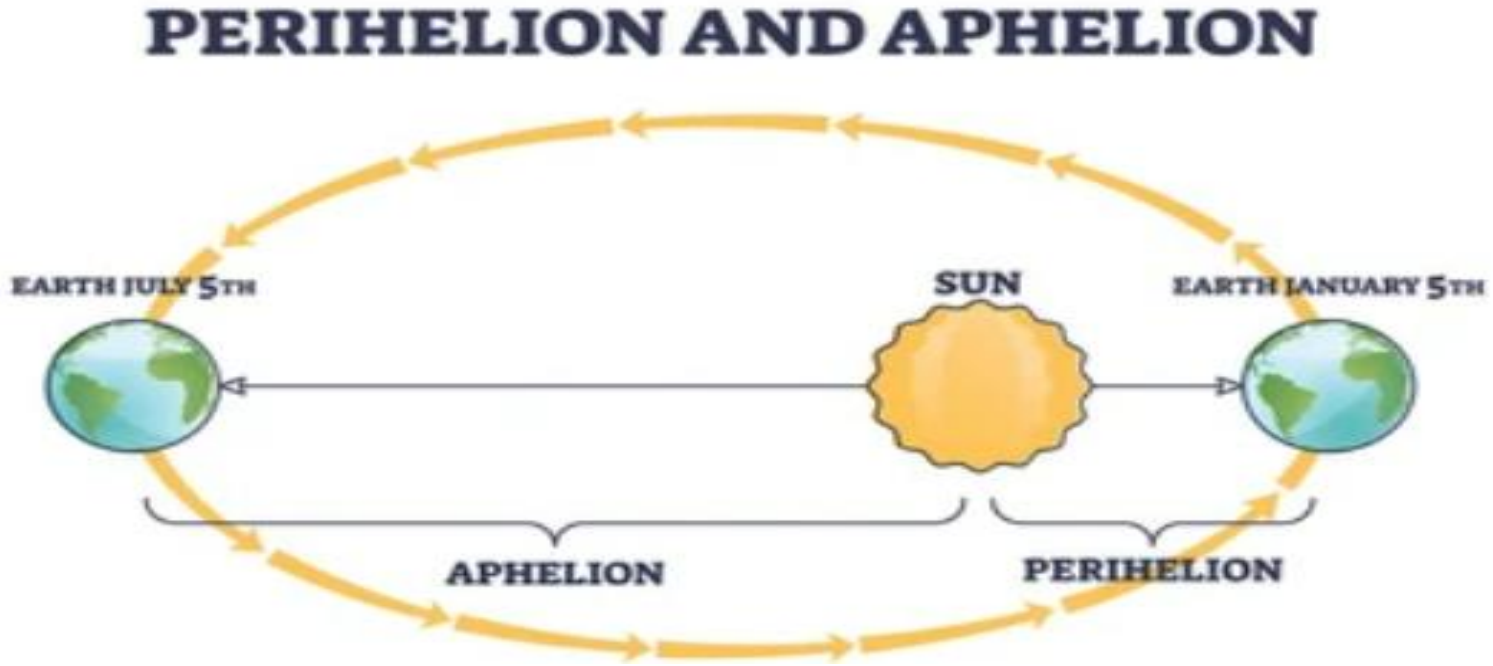

OUR EARTH AND ITS INTERIOR

EARTH-

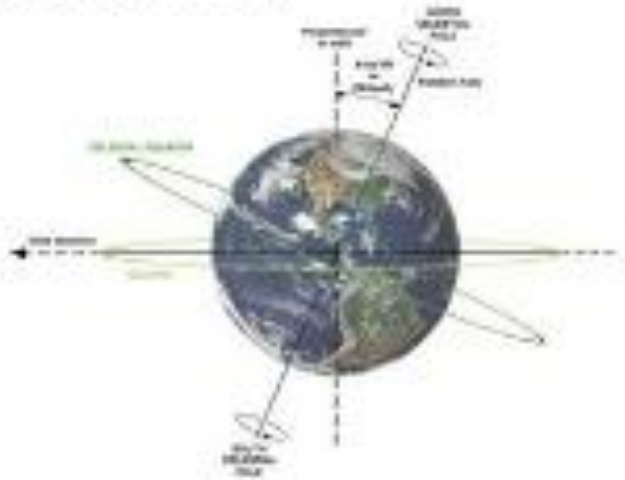
- Also called blue planet densest of all
- Circumference -40,232 km



Rotation

Characteristics

A **rotation** is a circular movement of an object around a *center* (or point) *of rotation*. A 3D three-dimensional object rotates always around an imaginary line called a *rotation axis*



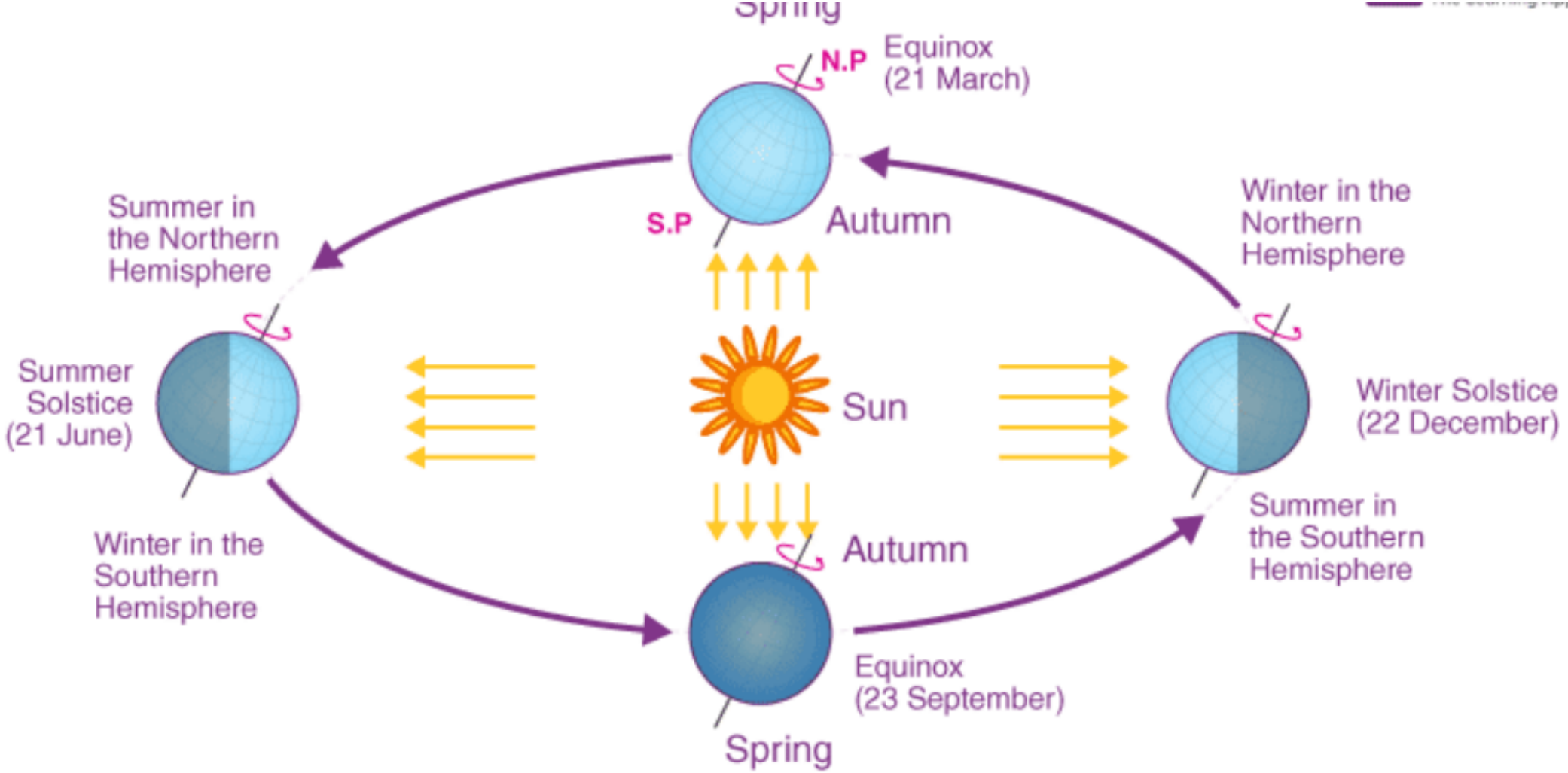
The Earth's rotation on it's axis takes 24hrs, causing day to the hemisphere facing the sun and night in the hemisphere facing away from the sun.

Revolution

Characteristics

A revolution is the orbital motion about a point, especially as *the planetary revolution about the sun.*

The Earth's planetary revolution about the sun takes 365.25 days, and because the Earth tilts on it's axis the sun's energy will be most direct causing summer in one hemisphere, and indirect causing winter in another hemisphere.


Spring
N.P
Equinox
(21 March)
S.P
Autumn
Summer in
the Northern
Hemisphere
Winter in the
Northern
Hemisphere
Summer
Solstice
(21 June)
Sun
Winter Solstice
(22 December)
Winter in the
Southern
Hemisphere
Autumn
Summer in
the Southern
Hemisphere
Equinox
(23 September)
Spring

Equinox refers to a day with an equal duration of day and night. We have two equinoxes in a year which are:

- Spring equinox on March 21
- Autumnal equinox on September 23

On the other hand, the solstice refers to a day with either the longest day or the shortest. The two solstices in a year are:

- Winter solstice on December 22
- Summer solstice on June 21

Equinox vs Solstice

Equinox	**Solstice**
Time of the year when the sun is nearest to the equatorial plane giving equal lengths of day and night.	Time of the year when the sun is farthest from the equatorial plane resulting in long nights and days.
An equinox occurs at the start of the spring and fall.	The solstice occurs during the summer and the winter.
Occurs on March 21 (Vernal equinox) and on September 23 (Autumnal equinox).	Occurs on June 21(Summer Solstice) and on Dec 22 (Winter Solstice).

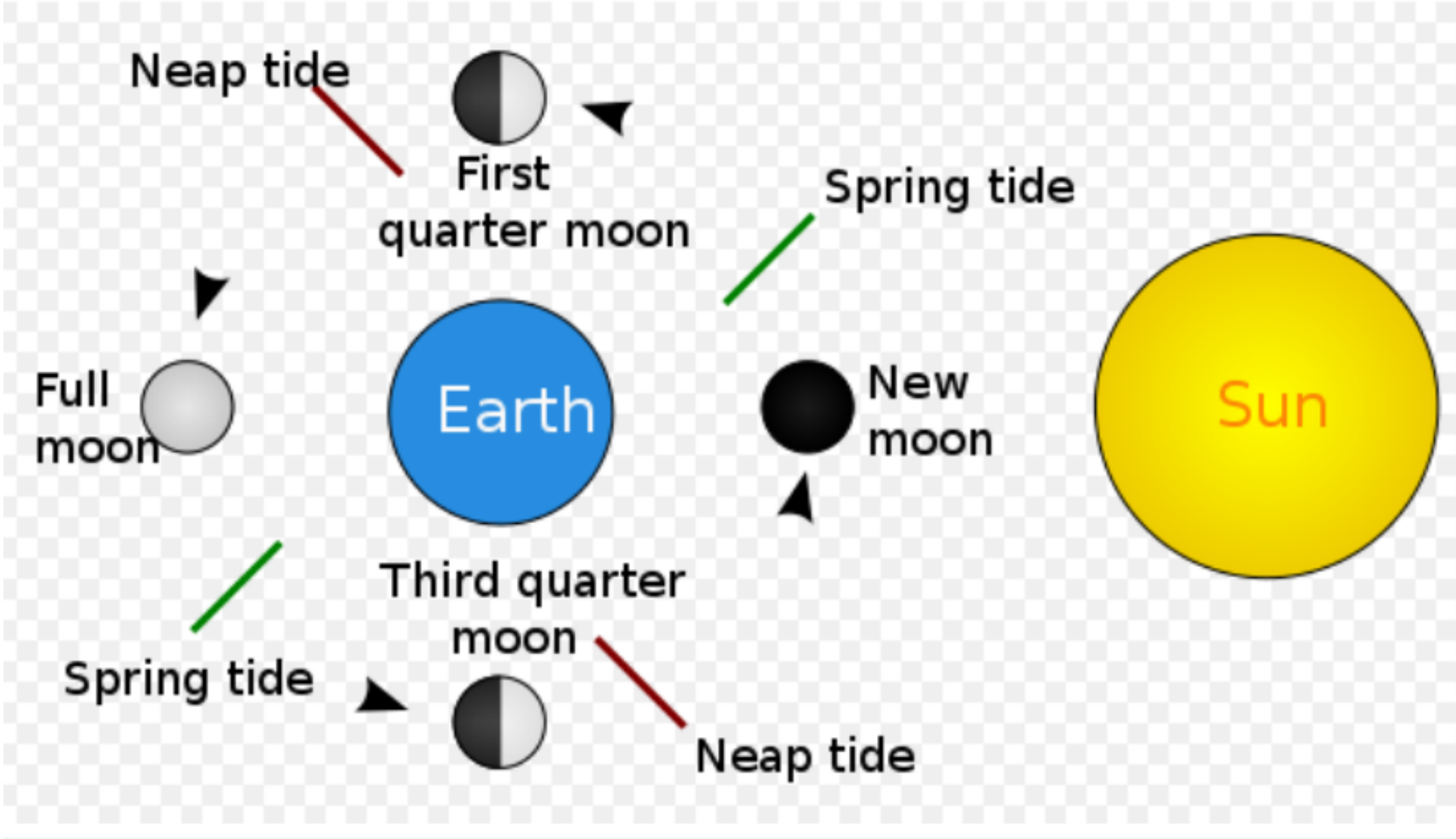
Spring Tides

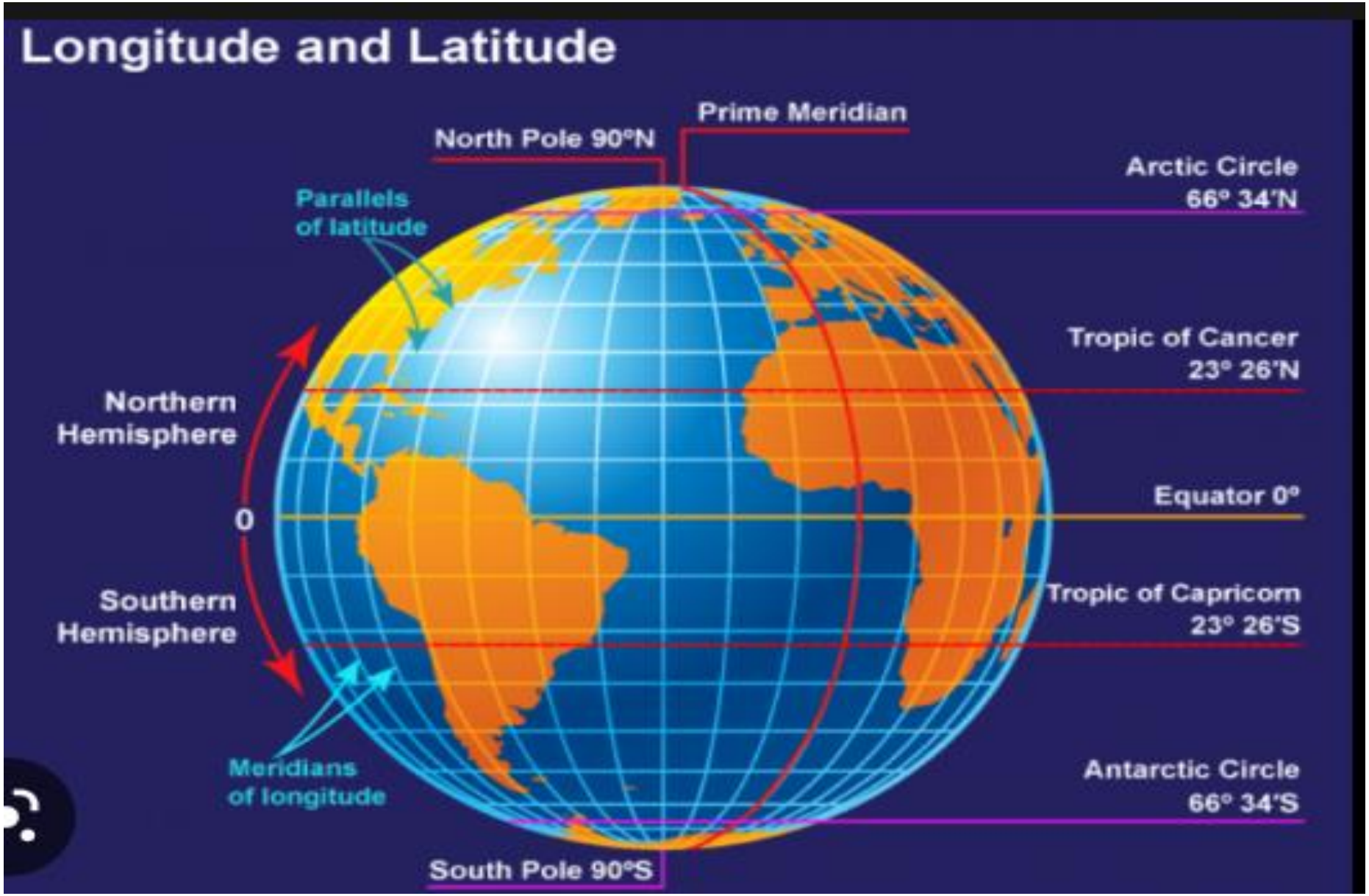
Spring tides are formed when the sun and the moon are in line with each other and pull the ocean surface in the same direction. This leads to higher high tides and lowers low tides and such tide is called a spring tide. In a lunar month, it occurs twice. It is also known by the name of 'King Tide.'

spring tides means 'springing forth.' These occur in full or new moon days. In both new moon or full moon days, the sun's gravitational pull is added to the moon's gravitational pull on Earth, causing the oceans to bulge a bit more than usual. This results in 'higher' high tides and 'lower' low tides.

Neap Tides

It occurs seven days after the spring tide. The prominent point is that the sun and the moon are at the right angle to each other. This tide occurs during the first and the last quarter of the moon. The gravitational pull of the moon and the resulting oceanic bulge is cancelled out by the gravitational pull of the sun and its resulting oceanic bulge. Also, in contrast to spring tides, the high tides are 'lower' and the low tides are comparatively 'higher' in neap tides.


Neap tide
First quarter moon
Spring tide
Full moon
Earth
New moon
Sun
Third quarter moon
Spring tide
Neap tide

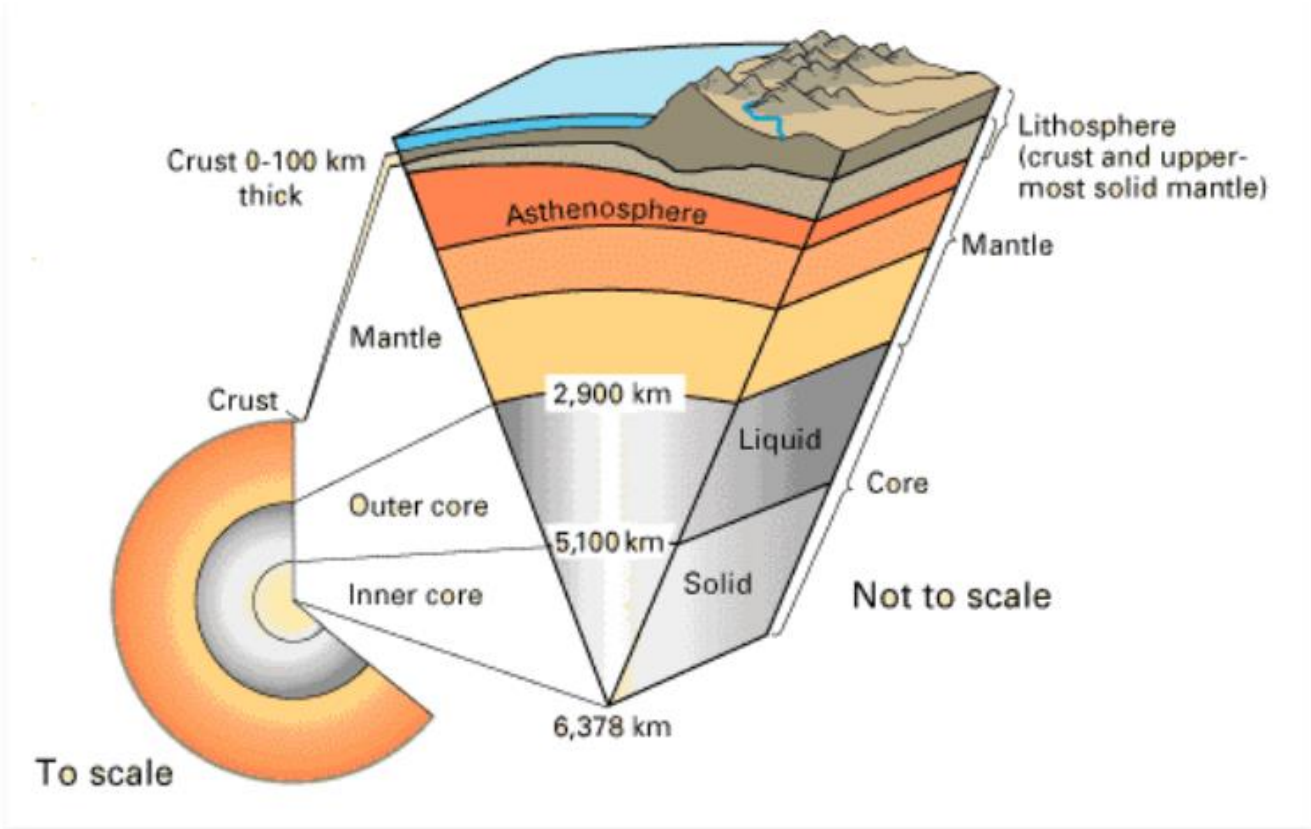

Longitude and Latitude
Prime Meridian
North Pole 90°N
Arctic Circle
66° 34'N
Parallels
of latitude
Tropic of Cancer
23° 26'N
Northern
Hemisphere
Equator 0°
0
Southern
Hemisphere
Tropic of Capricorn
23° 26'S
Meridians
of longitude
Antarctic Circle
66° 34'S
South Pole 90°S

Longitude	Latitude
These contain 360 longitudinal lines that measure east-to-west distance on the Prime Meridian.	These contain 180 latitudinal lines on the Prime Equator.
These lines are called meridians.	These lines are called parallels.
Classifies time zones.	Classifies heat zones.
They are imaginary lines that run through the surface of the earth vertically.	Latitudes are horizontal lines that run across the earth’s surface.
They are used to determine the time zones across the earth.	Latitudes are imaginary lines that designate heat fields in different parts of the Earth.
With longitudes, we can measure east-to-west distance on the Prime Meridian.	***Latitude measures the distance north or south of the equator.***

Big Bang Theory

- Big Bang Theory is a modern theory of the Origin and the Evolution of the Earth
- Edwin Hubble propounded this theory in the year 1920
- It is also known as the Expanding Universe Hypothesis
- It states that the universe is ever-expanding
- As per this theory, all the matter of the universe was accumulated in the centre
- It occupied a small space and had an extremely high temperature and density
- Around 13.7 billion years ago, there was a big explosion
- After the explosion, the atoms were formed and gradually energy changed to matter

Structure of the Earth



- The Crust
- The Mantle
- The Core

The Crust

- The crust is the outermost solid part of the earth.
- It is fragile.
- The thickness of the crust varies under the oceanic and continental areas.
- Oceanic crust is thinner as compared to the continental crust.
- The continental crust is thicker in the areas of major mountain systems.
- The crust is made up of heavier rocks having a density of 3 g/cm3.
- The kind of rock seen in the oceanic crust is basalt.
- The mean density of material in the oceanic crust is 2.7 g/cm3.
- Silica (Si) and Aluminium (Al) are major constituent minerals. Hence it is often termed as SIAL. Also, sometimes SIAL is used to refer to the Lithosphere.

The Mantle

- The portion of the interior beyond the crust is called the mantle.
- It is in a solid-state.
- It has a density higher than the crust portion.
- The thickness ranges from 10-200 km.
- The mantle extends from Moho's discontinuity to a depth of 2,900 km.
- The asthenosphere is the upper portion of Mantle.
- It is the chief source of magma that finds its way to the surface during volcanic eruptions.
- The crust and the uppermost part of the mantle are called the lithosphere.
- The major constituent elements of the mantle are Silicon and Magnesium and hence it is also termed as SIMA

The Core

- The core-mantle boundary is positioned at the depth of 2,900 km.
- The inner core is in the solid-state whereas the outer core is in the liquid state.
- The core is made up of very heavy material mostly constituted by nickel and iron. Hence it is also called the “nife” layer.

Question : The average density of the earth is-

a) 2.3 gm/cm^3

b) 5.5 gm/cm^3

c) 17.2 gm/cm^3

d) 6.5 gm/cm^3

Question : The outer core of the Earth is made up of

(a) nickel-iron alloy

(b) platinum

(c) copper

(d) iron

Question : On the basis of the satellite data the average density of the core of the earth is-

(a) 13 g cm^3

(b) 12 g cm^3

(c) 11 g cm^3

(d) 10 g cm^3

Question : The thickness of outer core of the Earth is about

(a) 2,250 km

(b) 1,250 km

(c) 1,500 km

(d) 1,870 km

Question : The upper portion of mantle is known as

(a) Asthenosphere

(b) Crust

(c) Lithosphere

(d) Fossil Sphere

Question : The asthenosphere is-

(a) Totally moltel

(b) Partially moltel

(c) Totally solid

(d) Partially solid

Question : The minimum thickness of crust under the oceans is

(a) 8 km

(b) 2 km

(c) 5 km

(d) 10 km