

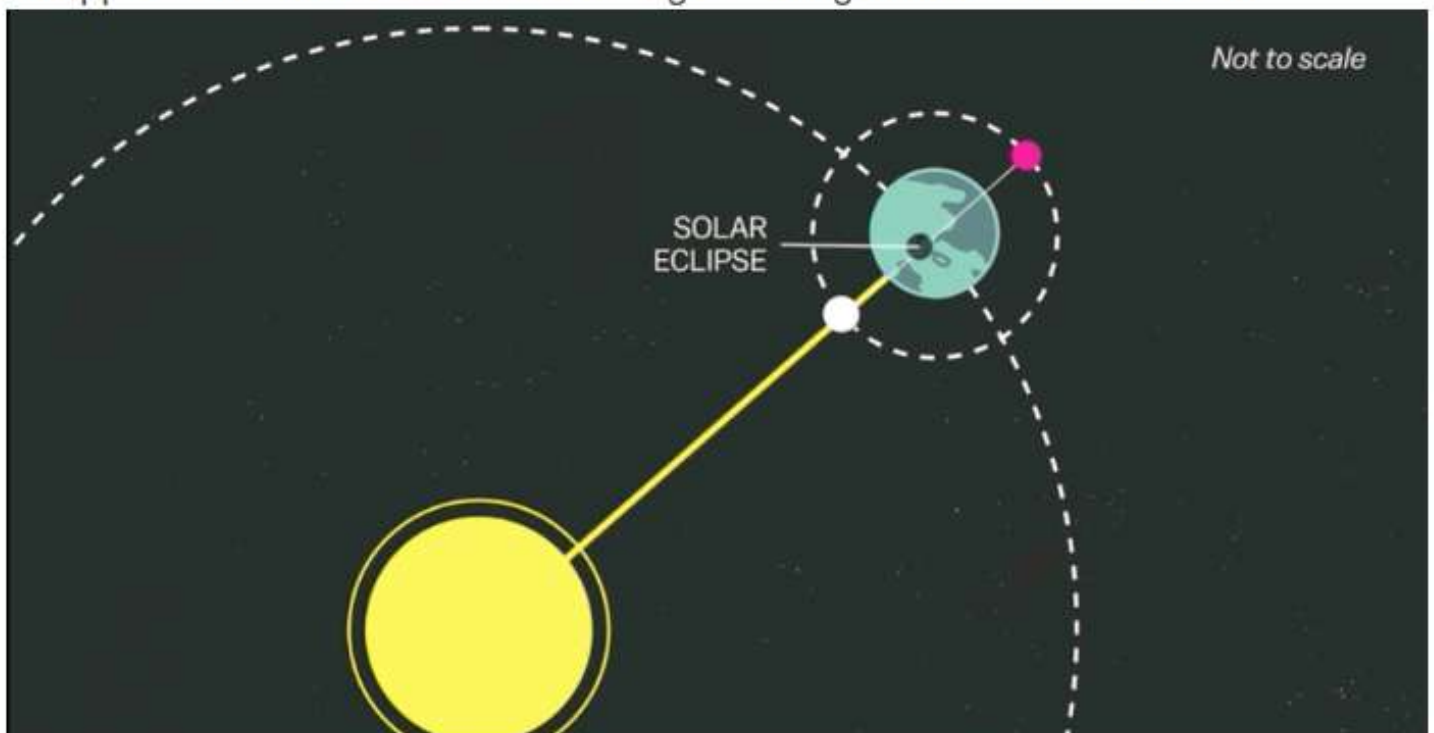
Geography Class 07

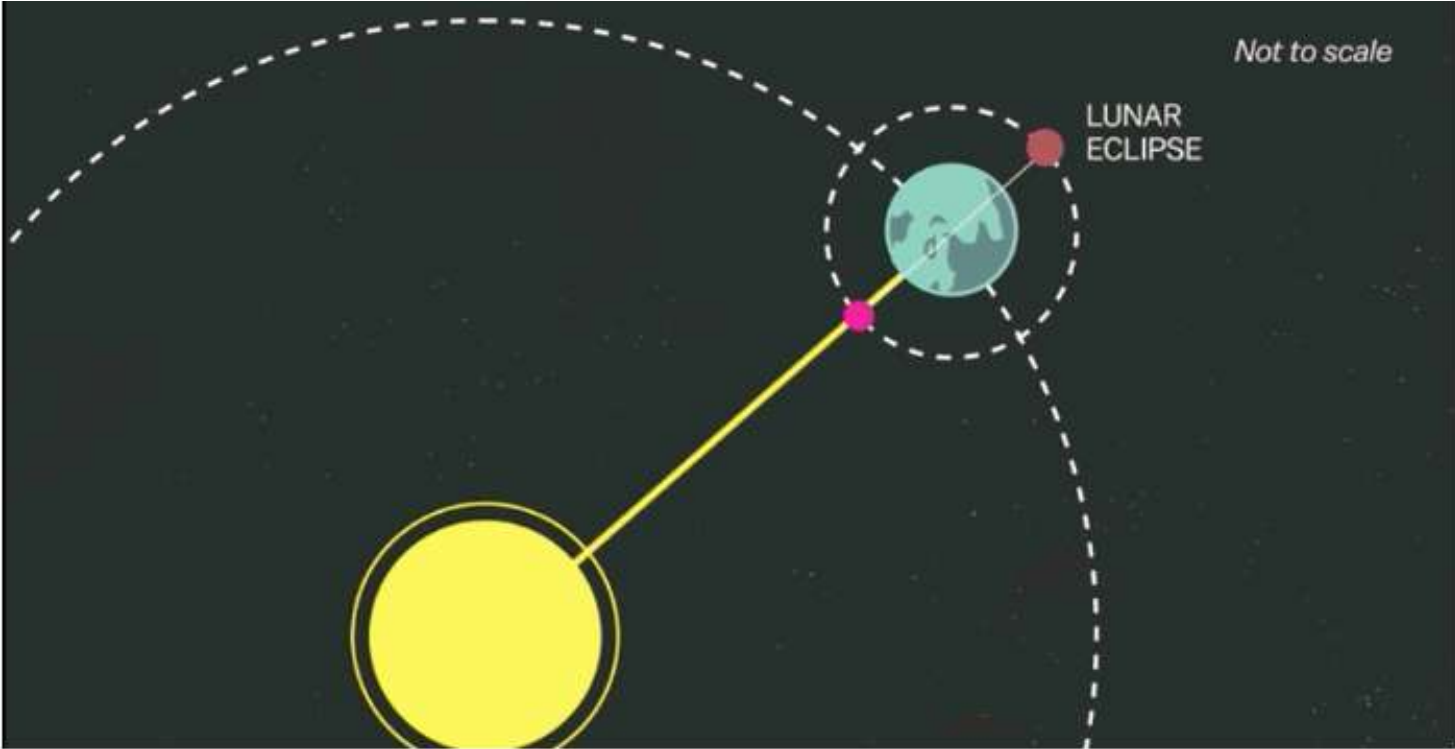
ECLIPSE (9:10 AM):

- The literal meaning of "eclipse " is to block/cover something.
- We see eclipses when one heavenly body moves into the shadow of another.

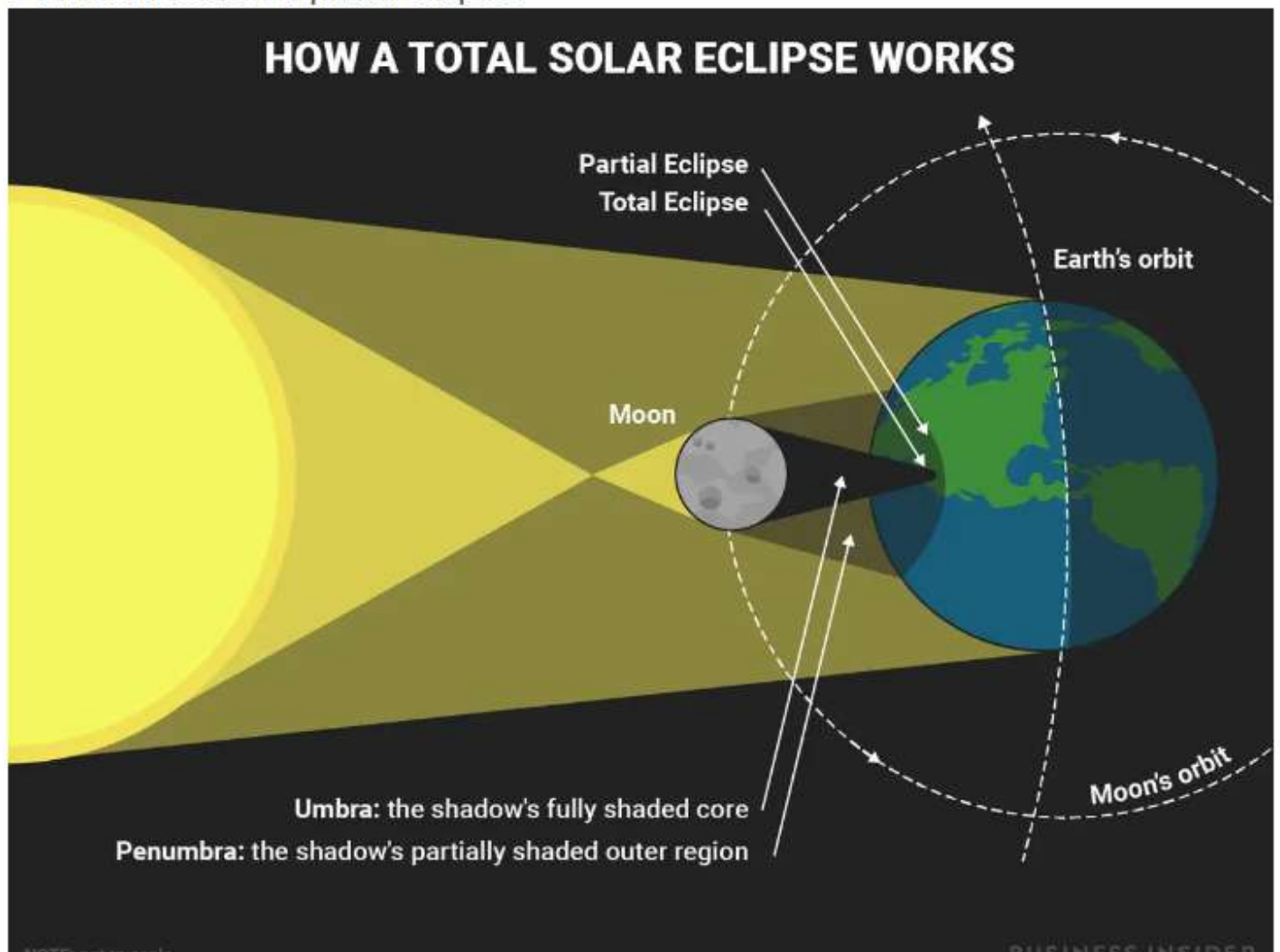
Solar Eclipse:

- It happens when the moon blocks the light coming from the sun to the earth.

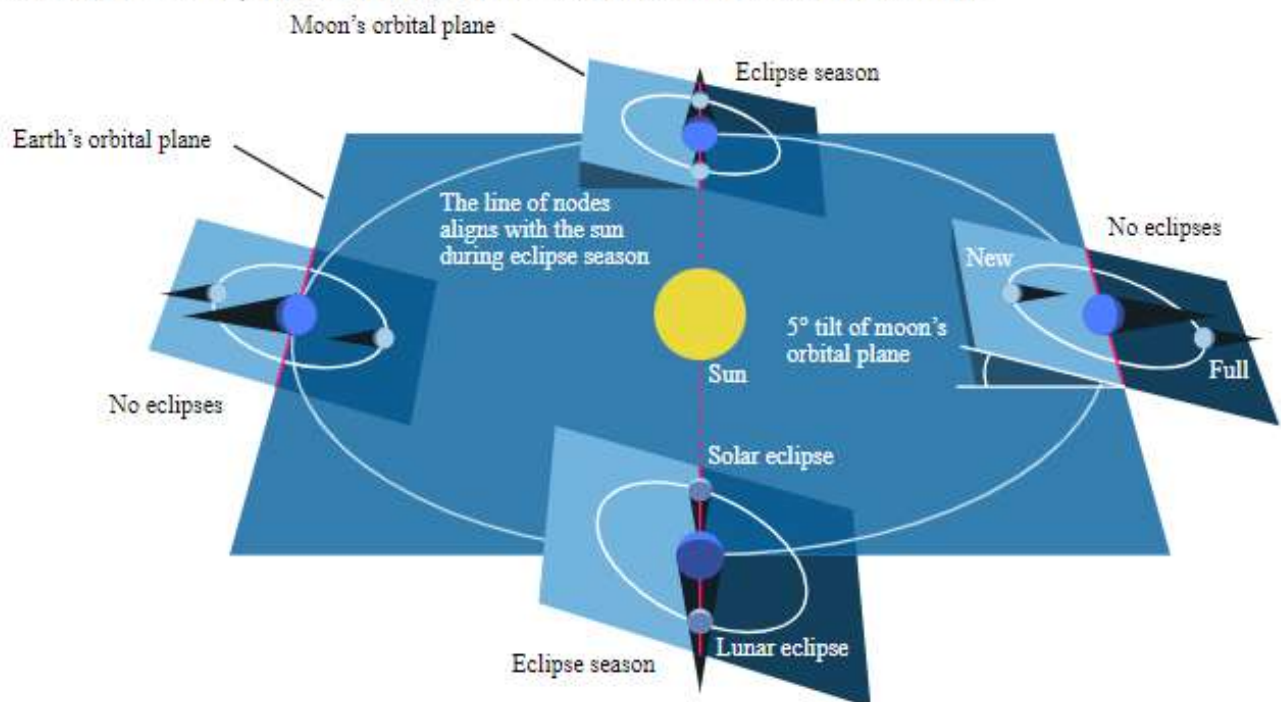




- **Umbra** is the dark shadow region on the earth where the sun is completely blocked during a solar eclipse.
- Umbra is also understood as the darker shadow of the blocking body, which causes a total eclipse.
- **Penumbra** is the light shadow region on the earth where the sun is partially blocked during a solar eclipse.
- Penumbra causes a partial eclipse.



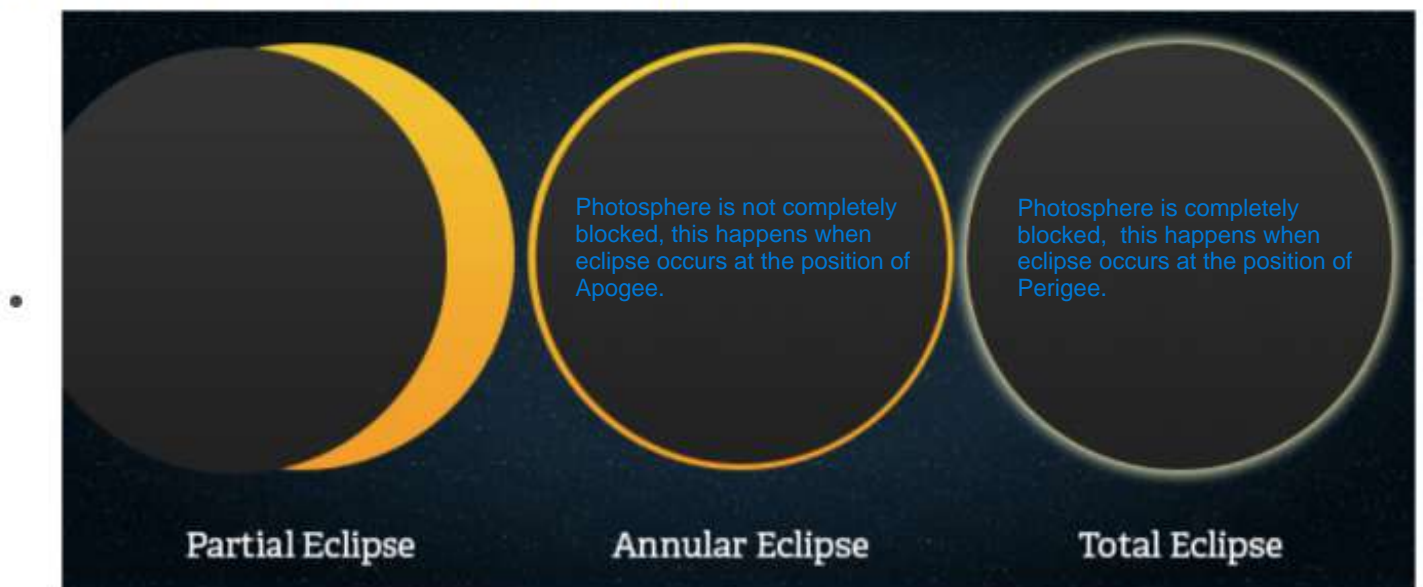
- When the moon blocks the light of the sun from reaching the earth, it casts a shadow onto the earth to cause a solar eclipse.
- We won't see a solar eclipse every time the moon gets in between the Earth and the sun.
- The occurrence of a solar eclipse also depends upon the tilted position of the moon or its axis, while it lies between the sun and the earth.



- The moon can block the sun despite being much smaller (400 times) because the moon is situated much closer to the Earth (400 times) than the sun.

orbit of moon around earth is also elliptical and the position of moon nearer to earth is known as Perigee and position of moon farther to earth is known as Apogee.

TYPES OF SOLAR ECLIPSE (9:30 AM):



Total Solar Eclipse:

- It is when the sun is completely blocked by the moon.
- It is visible from Umbra.
- A total solar eclipse always starts with a partial solar eclipse.
- After a total solar eclipse, we will again see a partial solar eclipse.



Partial Solar Eclipse:

- It is when the sun is partially blocked.
- It is visible from the penumbra.

Annular Solar Eclipse:

- When the moon is at its apogee(farthest) from the Earth, it will not be able to cover the whole photosphere.
- This will create a ring in the sky called the **Ring of Fire**.



Hybrid Solar Eclipse:

- When we have both total and annular eclipses at the same time, in different places of the earth.

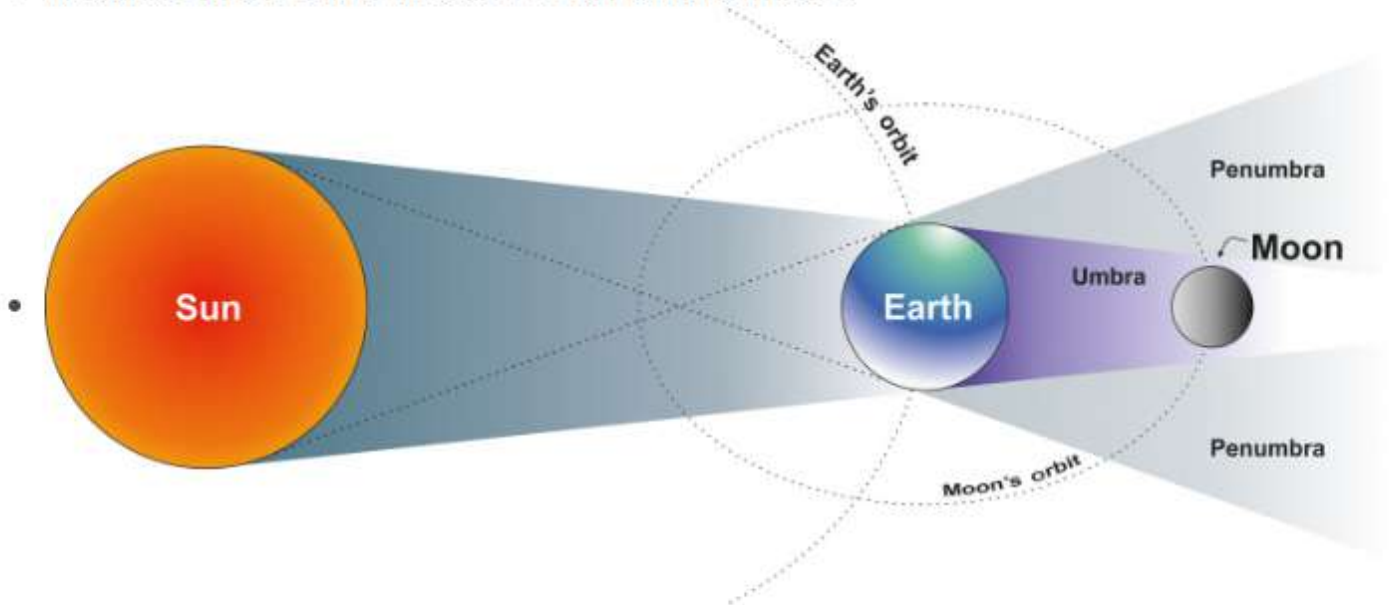
We won't always be seeing solar eclipses because :

- The moon is moving farther from the Earth at the rate of around one inch a year.
- In around a billion years, the moon will get so far from the Earth that a solar eclipse won't be observed from the Earth.

It is also known as annular-total eclipse.

Lunar Eclipse:

- When the earth comes between the sun and the moon blocking the light from the sun which was supposed to be reflected by the moon.
- It causes the Earth's shadow to fall on the moon.



Types of Lunar Eclipse:

• Total Lunar Eclipse:

- It is when the moon is located within the **Umbra** of the earth and it is totally shadowed.
- In this position, only the light from the Earth's atmosphere reaches the moon with **red light**, causing the moon to appear red in **color(Blood Moon)**.
- This is because red light has the largest wavelength, so they get the least scattered.

Partial Lunar Eclipse:

- When the moon is located between the **Umbra & Penumbra**, a partial shadow of the Earth covers the moon.

Penumbral Lunar Eclipse:

- It is when the moon is completely located in the penumbra.
- In this position, the moon appears darker in comparison to the full moon.
- There can be **no annular** lunar eclipse due to the smaller size of the moon.

Total Lunar Eclipse



Due to the refraction of red light from earth's atmosphere.

Partial Lunar Eclipse



Penumbral Lunar Eclipse



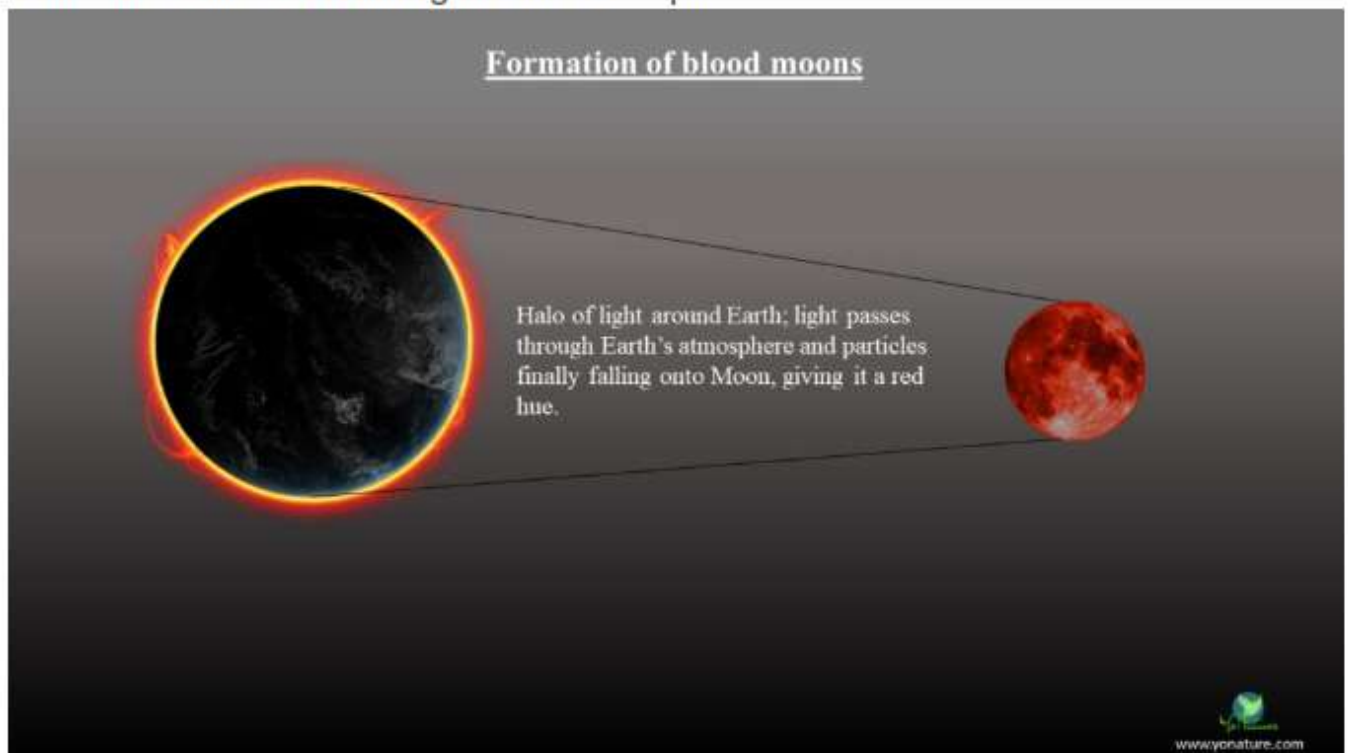
DIFFERENT TYPES OF MOONS (10:00 AM):

- **Super moon:**
- This is a phenomenon of a full moon that coincides with the perigee of the moon.
- It is when the moon is closest to the Earth while on its elliptical orbit.
- The moon appears bigger and closer than usual.



Blood moon:

- This is the full moon during the lunar eclipse.



Blue moon:

- The second full moon of the month. (let say we witnessed on the date of 1 in a month and on around 31 in same month)
- It is rare because usually, one month will only have one full moon.
- It is not related to solar or lunar eclipse.
- We can also have a **super blue blood moon**, as we had on 31st January 2018.

DIFFERENCES BETWEEN SOLAR & LUNAR ECLIPSES (10:30 AM):

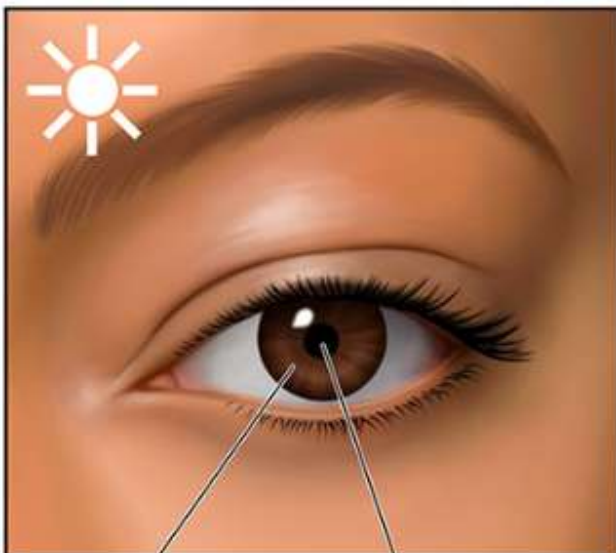
• Solar Eclipse	Lunar Eclipse
The relative position is Sun-Moon-Earth.	The relative position is Sun-earth -Moon
There can be an annular solar eclipse	There cannot be an annular lunar eclipse
It happens only on the day of a new moon.	It happens only on a day of a full moon.
We have a smaller umbra here.	The umbra is larger.
It is shorter in duration.	It has a longer duration.
The area on the earth where it is visible is smaller.	The area on the earth where it is visible is larger.
It is not safe to look at the solar eclipse with the naked eye.	It is safe to look at the solar eclipse with the naked eye.

It is not safe to look at a solar eclipse due to naked eye because:

- It is safe to look at the eclipsed sun as such.
- The real issue gets when we are looking at the sun while the solar eclipse gets over.
- Our pupils will get dilated when we will look at the eclipsed sun, which is totally dark.
- We are not sure when the solar eclipse will get over.
- Once the solar eclipse gets suddenly over, our pupils won't be able to properly adjust their opening.

Dilated Pupils

Direct response - constricted



Iris

Pupil

Direct response - dilated



- The solar radiation levels are more or less the same with or without the eclipse.

Totality for a Solar Eclipse:

- It refers to a state in which the light from the sun is completely blocked from reaching a point on the Earth.
- Just before the start and end of the total solar eclipse, we see the **Baily Beads / Diamond Ring effect**.
- We see a ring similar to a shining diamond as the final sun's rays get obstructed by the moon.



Revolution by the Sun:

- The sun orbits around the center of the Milky Way galaxy.
- The time taken for the revolution is called **Galactic /Cosmic Year**.
- One galactic year is equal to around d **230 million Earth years**.
- The sun/Solar system is doing this motion with a speed of **230 km/second**.



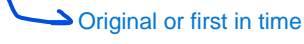
GEOMORPHOLOGY (10:55 AM):

- It is a study of physical features and the processes associated with these features.

Origin & Evolution of the Earth:

- The Big Bang theory and the Nebular hypothesis have given us sufficient ideas about the origin of the earth.

Evolution of the Earth:

- The planet Earth was totally barren and rocky at its origin.
- There was a thin atmosphere of hydrogen and helium.
- This **primordial** earth gradually evolved into the present stable one with a thick atmosphere.  Original or first in time

Formation of the inner layers:

- Due to a gradual increase in the density, the interior temperature increased.
- This led to density separation causing heavy elements to sink toward the center, and the lighter ones moved toward the surface.
- With time, the earth cooled further and gradually condensed into a smaller size.
- The further process of differentiation led to the formation of different layers in the interior.

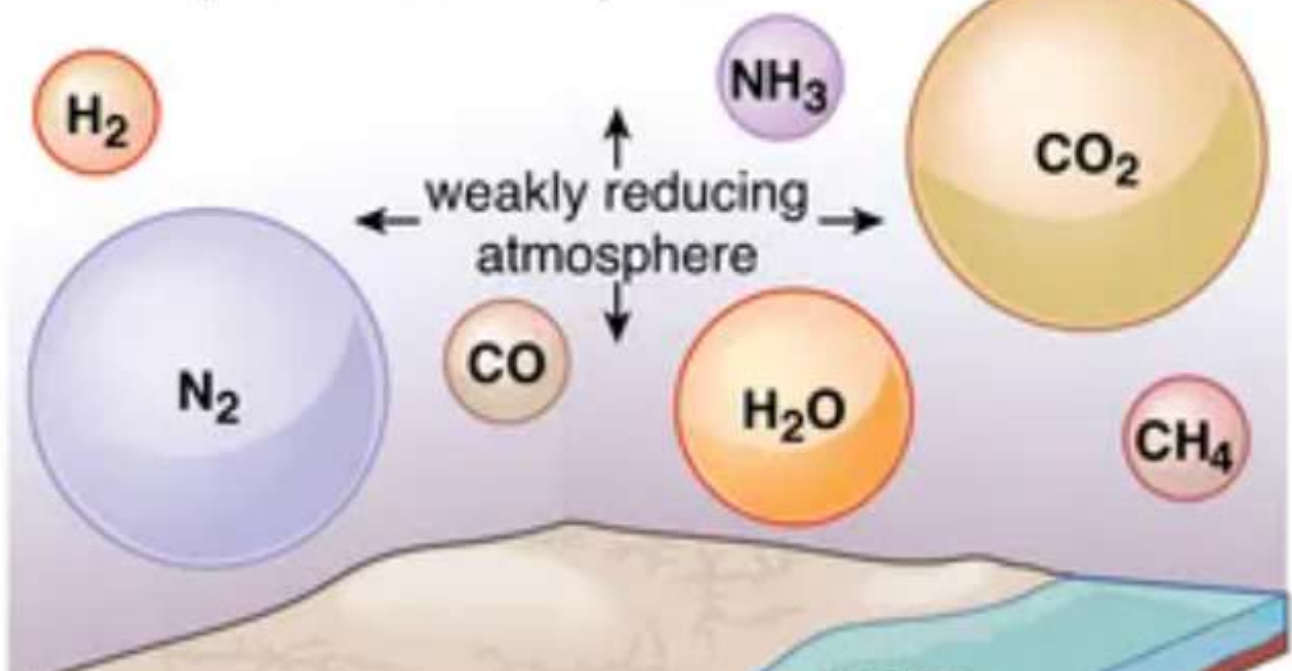
Interior of the Earth:


- **Density Separation** caused a major role in the formation of the interior layers of the earth.
- Under this phenomenon, denser materials like Iron & Nickel sank below and got situated in the earth's core.
- Also, lighter materials like Aluminium & Silicon rose towards the upper surface of the earth.
- The process continued and gradually, multiple layers of the earth came to shape.

EVOLUTION OF ATMOSPHERE & HYDROSPHERE (11:30 AM):

- The early atmosphere with hydrogen and helium was stripped off due to **solar winds**.
- During the cooling of the earth, gases and water vapor were released from the earth's interior.
- The process through which the gases were out-poured into the atmosphere is called **Degassing**.
- **Volcanic eruptions** released more water vapor and gases.
- The important gases at this stage were nitrogen, carbon dioxide, methane, water vapor, and very little oxygen.

Earth's prebiotic atmosphere



- As the earth cooled further, the water vapor started to condense and the **carbon dioxide** from the atmosphere got dissolved in rainwater.
- It was brought down to the earth's surface.
- This further decreased the temperature of the atmosphere which caused more condensation and precipitation.
- The rainfall from the atmosphere got collected in the depressions on the surface and **oceans were formed**.
- The ocean formation was completed around 4000 million years ago.
- Life evolved in the form of **non-photosynthetic microorganisms** inside the oceans some 3800 million years ago.  The organisms which can't prepare their own food
- Between 3000-2000 million years ago, **Blue Green Algae** emerged in the ocean waters.
- It started to release oxygen through **photosynthesis**.
- By 2000 million years ago, oceans were saturated with oxygen, and **oxygen started to flood the atmosphere**.
- This increased the amount of oxygen in the atmosphere.

Basics of Mapping :

- This will be important for questions on Geography, Environment, and International relations.
- We will also be expected to draw some maps in certain questions in the main examination.
- We need to be prepared regarding the locations in the news.

Location-related questions are not to be covered in too much depth, but we need to be prepared with:

- I. Why it is in the news?
- II. Where it is located.

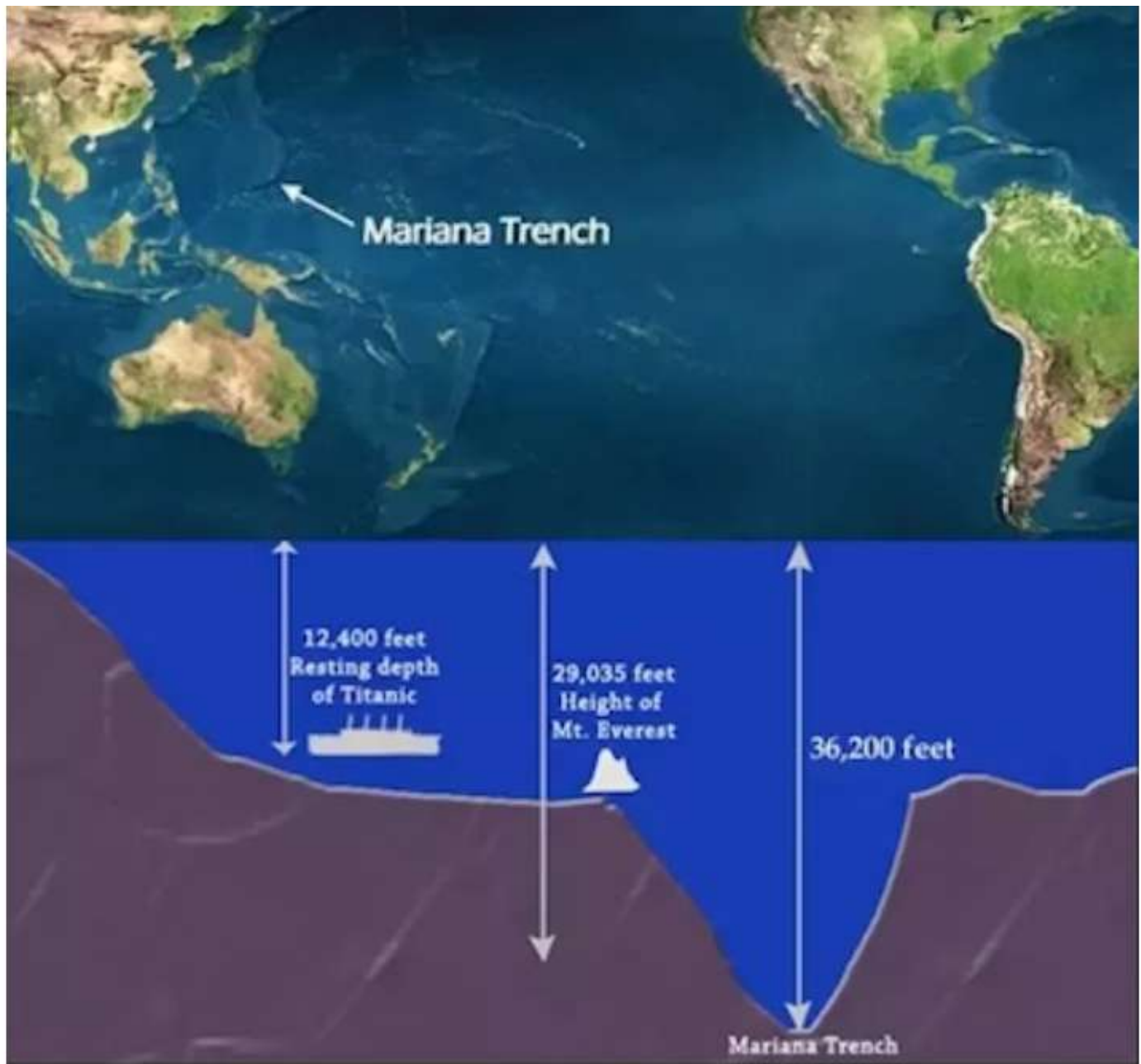
Basics of World Mapping:



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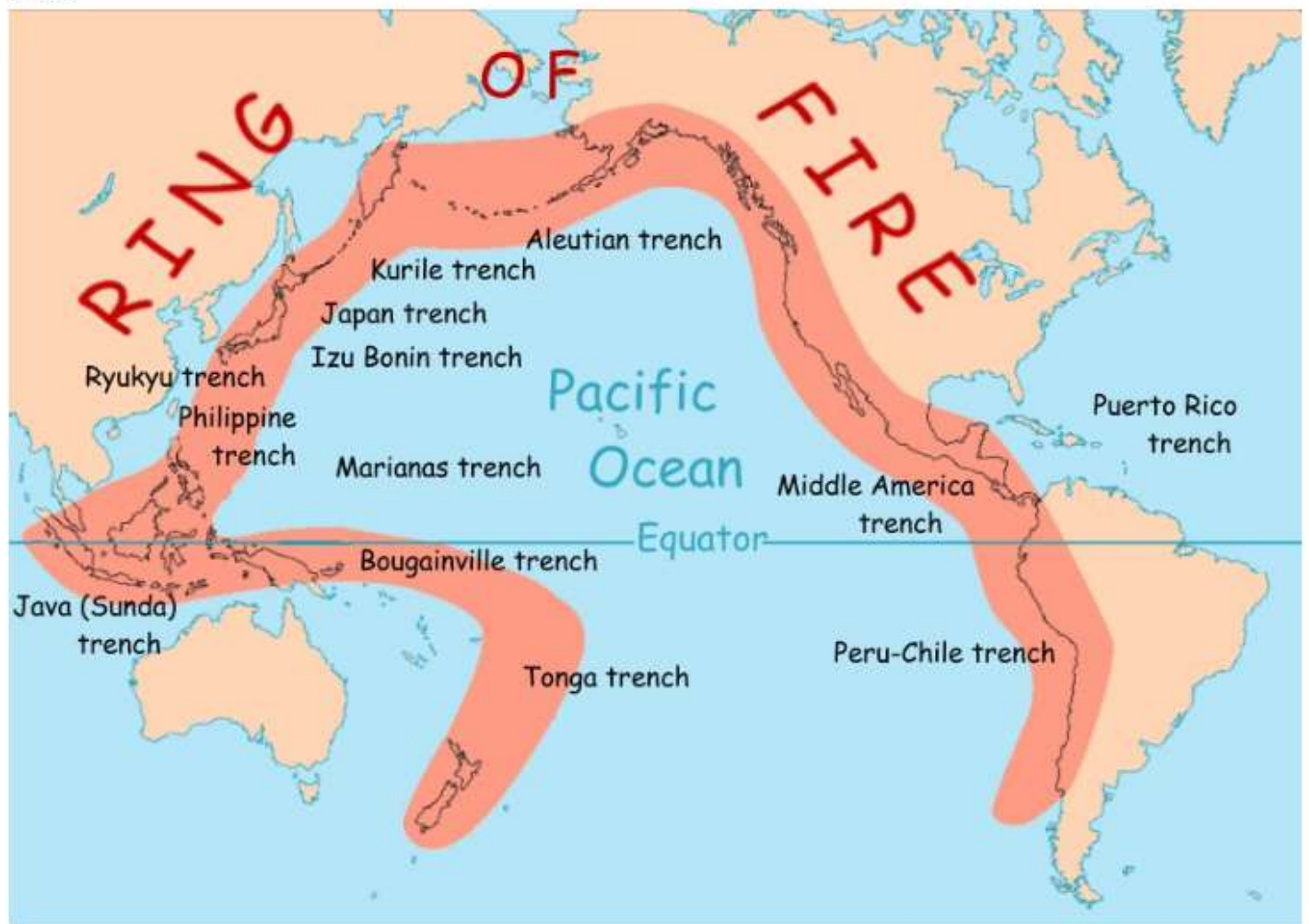
Pacific Ocean:

- It is both the largest and the deepest ocean.
- The presence of **trenches** from all sides. make the pacific ocean the deepest.
- **Marianna Trench** is the deepest trench.
- **Challenger Deep** is the deepest point(nearly 11 kilometers from the sea level) of the Marianna Trench, hence the deepest point of the earth.



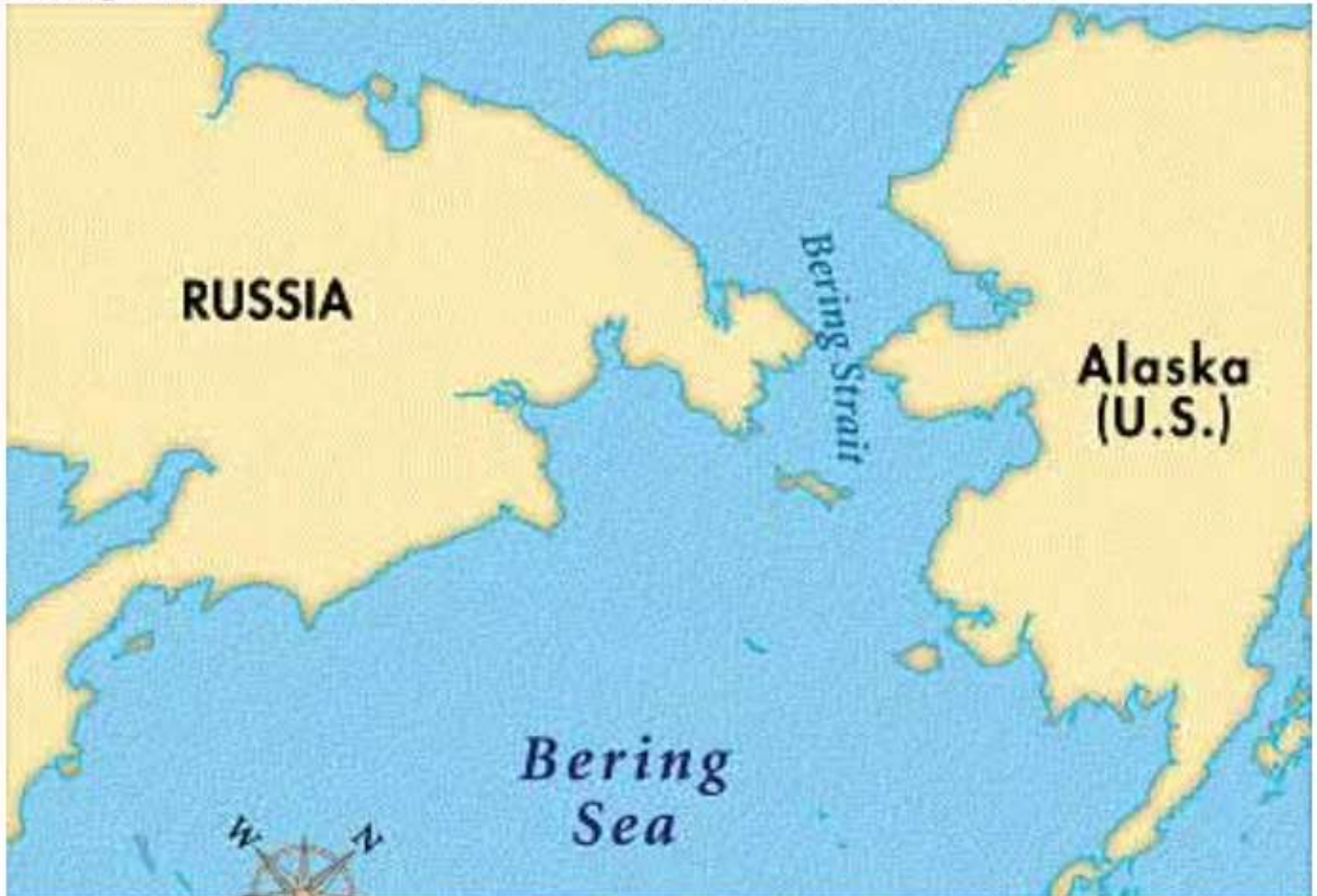
- Trenches are also sites of active volcanic and tectonic activity.
- A very famous continuous chain of active tectonic activity is called the **Ring Of Fire**.

Fire:



- **Bering Strait** connected the Pacific Ocean with the **Arctic Ocean**.

- **Bering Strait** connected the Pacific Ocean with the **Arctic Ocean**.



- Strait refers to the narrow channel that connects two large water bodies.
- The **Drake's Passage** connects the Pacific Ocean with the **Atlantic Ocean**.



The topics for the next class are Geological Timescale (class 11 Ncert) and Interior of the Earth.

Geological Time Scale

<i>Eons</i>	<i>Era</i>	<i>Period</i>	<i>Epoch</i>	<i>Age/ Years Before Present</i>	<i>Life/ Major Events</i>
	Cainozoic (From 65 million years to the present times)	Quaternary	Holocene Pleistocene	0 - 10,000 10,000 - 2 million	Modern Man Homo Sapiens
		Tertiary	Pliocene Miocene	2 - 5 million 5 - 24 million	Early Human Ancestor Ape: Flowering Plants and Trees
			Oligocene Eocene Palaeocene	24 - 37 Ma 37 - 58 Million 57 - 65 Million	Anthropoid Ape Rabbits and Hare Small Mammals : Rats – Mice
	Mesozoic 65 - 245 Million Mammals	Cretaceous Jurassic Triassic		65 - 144 Million 144 - 208 Million 208 - 245 Million	Extinction of Dinosaurs Age of Dinosaurs Frogs and turtles
	Palaeozoic 245 - 570 Million	Permian		245 - 286 Million	Reptile dominate-replace amphibians
		Carboniferous		286 - 360 Million	First Reptiles:
		Devonian Silurian		360 - 408 Million 408 - 438 Million	Vertebrates: Coal beds Amphibians
		Ordovician Cambrian		438 - 505 Million 505 - 570 Million	First trace of life on land: Plants First Fish No terrestrial Life : Marine Invertebrate
Proterozoic Archean	Pre-Cambrian 570 Million - 4,800 Million			570 - 2,500 Million 2,500 - 3,800 Million	Soft-bodied arthropods Blue green Algae:
Hadean				3,800 - 4,800 Million	Unicellular bacteria Oceans and Continents form – Ocean and Atmosphere are rich in Carbon dioxide
Origin of Stars	5,000 - 13,700 Million			5,000 Million	Origin of the sun
Supernova				12,000 Million	Origin of the universe
Big Bang				13,700 Million	