Q: Distinguish between solar and lunar eclipse.

Difference between Solar And Lunar Eclipse

Good answers!!

Features	Solar Eclipse	Lunar Eclipse
1- Definition	Solar eclipse occurs when the Moon comes between the Earth and the Sun, blocking all or part of sun's light from reaching the earth.	Lunar eclipse occurs when the Earth comes between the Sun and the Moon, casting shadow of Earth on the surface of the Moon.
2- Frequency	Solar eclipse occurs 2 to 5 times a year.	Lunar eclipse occurs 2 to 4 times a year.
3- Duration	Solar eclipse lasts for few minutes.	Lunar eclipse lasts for few hours.
4- Safety	Viewing solar eclipse requires specific eye protection to prevent damage of eye.	Lunar eclipse can be seen with naked eye.

5-	Visibility	Solar eclipse is visible only in a narrow path on Earth where the shadow falls.	Lunar eclipse is visible from anywhere on night side of Earth.
6-	Types of shadows involved	Umbra, Penumbra and Antumbra are involved.	Only Umbra and Penumbra are involved.
-	Types of eclipse	Solar eclipse can be total, partial and annular.	Lunar eclipse can be total, partial and penumbral.

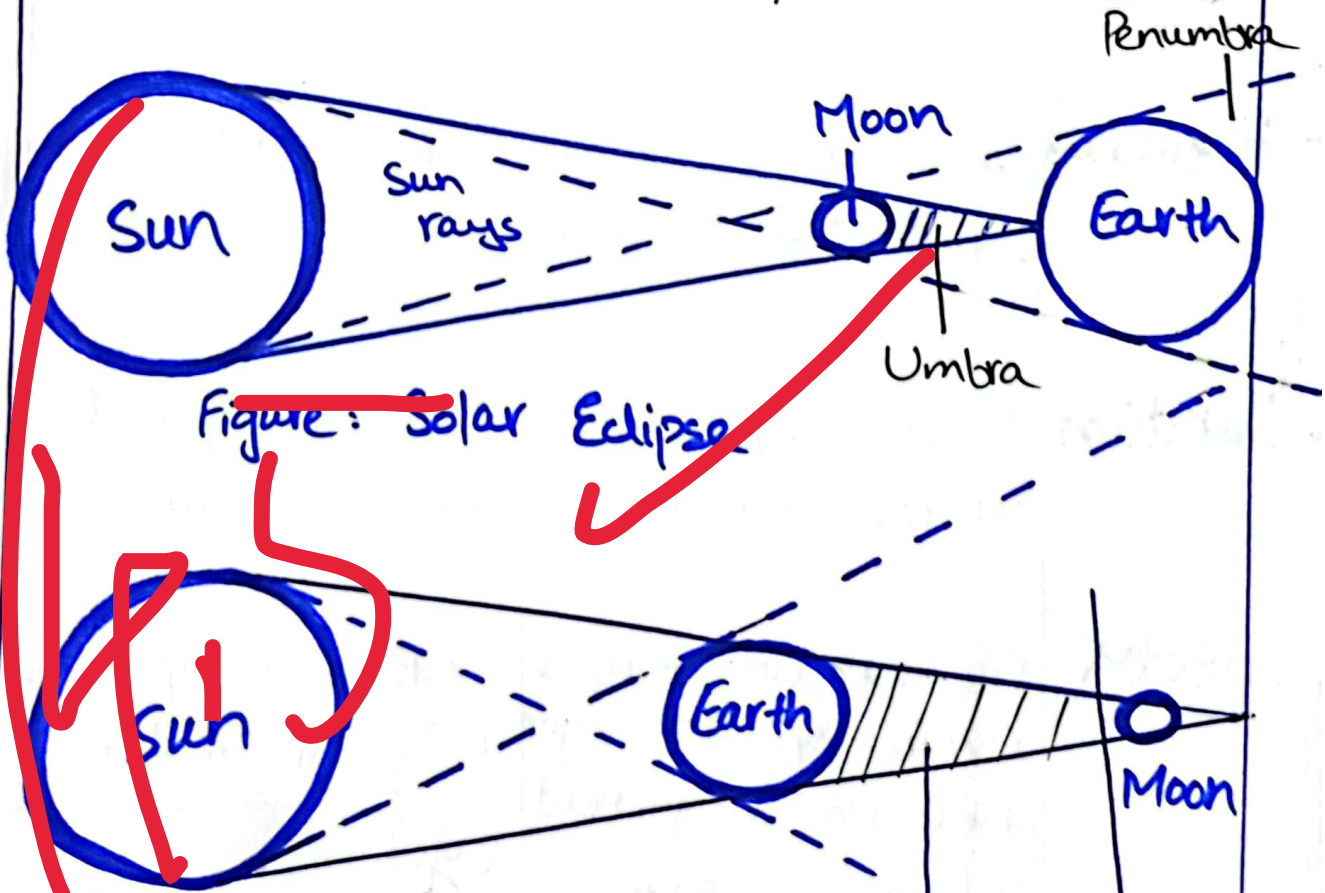

Figure: Solar Eclipse

Figure: Lunar Eclipse

Q: Distinguish between Nuclear Fission and Nuclear Fusion reaction.

	Features	Nuclear Fission	Nuclear Fusion
1-	Definition	This process is defined as splitting up of a heavy nucleus into two lighter nuclei.	This process is defined as combining two light nuclei to form a heavy nucleus.
2-	Example	Following reaction is an example of nuclear fission reaction. $U_{92}^{235} + n_0^1 \longrightarrow Ba_{56}^{141} + Kr_{36}^{92} + 3n_0^1 + Energy$	Following reaction is an example of nuclear fusion. $H_1^2 + H_1^3 \longrightarrow He_2^4 + n_0^1 + Energy$
3-	Occurence in Nature	This reaction occurs rarely. It occurs in radioactive decay.	It occurs commonly to power sun and stars.
4-	Energy Output	Moderate amount of energy is released per reaction.	Large amount of energy is released per reaction.
5-	Temperature Requirement	This reaction takes place at relatively lower temperatures.	This reaction takes place at extremely high temperatures.

6-	Fuels for the reaction	(Rad) Uranium and Plutonium are common fuels for this reaction.	Hydrogen isotopes are common fuels for this reaction.
7-	Chain reaction	This reaction can sustain a chain reaction easily.	This reaction requires extreme conditions to sustain chain reaction.
8-	Use	This reaction is used in nuclear power plants and atomic bombs.	This reaction is used in hydrogen bombs and research reactors.
9-	Environmental Impact	These reactions are potentially hazardous for the environment.	These reactions are less harmful for the environment.

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Q: What is the difference between Natural and Synthetic Antioxidants.

	Features	Nodural Anti-Oxidants	Syntheti Anti-Oxidants
1-	definition	Natural anti-oxidants are compounds that are obtained from natural sources like animals, plants, minerals.	synthetic anti-oxidants are compounds that are ~~obtained from~~ chemically synthesized in laboratories.
2-	Examples	Vitamin C (ascorbic acid), Vitamin E etc.	BHT (butylated hydroxytoluene), BHA (butylated hydroxyanisole) etc
3-	Chemical composition	They are mixtures of polyphenols and vitamins.	They are compounds having stable chemical structure.
4-	Cost	They are more expensive.	They are cheaper than natural anti-oxidants.
5-	Biodegradability	They are generally biodegradable	They are less biodegradable than natural ones.
6-	Safety	They are safe to use.	There are some concerns over its long term

			safety.
7-	Water Solubility	They are more soluble in water.	They are less soluble in water.
8-	Applications	They are used in health supplements, pharmaceuticals, food preservation, cosmetic industry and agriculture.	They are used in plastics, paints, lubricants, animal feed and textiles.

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b) A soap factory makes 600 units in 9 days with the help of 20 machines. How many units can be made in 12 days with help of 18 machines?

No. of units made by factory = 600

No. of days in which 600 units are made = 9

No. of machines in which 600 units are made = 20

Let

No. of new units manufactured by factory = x

No. of days in which x units are made = 12

No. of machines in which x units are made = 18

Using Proportion Formula

Units	Days	Machines
600	9	20
x	12	18

Using above relation in given quantities, equation can be written as

$$\frac{x}{600} = \frac{12}{9} * \frac{18}{20}$$

$$\frac{x}{600} = \frac{6}{5}$$

Multiplying by 600 on both sides

$$\frac{x}{600} * 600 = \frac{6}{5} * 600$$

$x = 720$

Thus, 720 units will be manufactured in 12 days with the help of 18 machines.

Q: A car covers a distance of 450m in 1minute whereas train covers 69km in 45mins. Find ratio of their speeds

Distance covered by a car = $450m = \frac{450}{1000} * 1000$

Distance covered by a car = 0.45 km

Time taken by a car = 1min

$= 1 * \frac{60}{60}$

Converting 1min into hrs

1min = 0.016 hr

Speed of the car = $\frac{\text{Distance covered}}{\text{Time taken}} = \frac{0.45km}{0.016}$

Speed of car = 28.12 km/hr

Distance covered by train = 69km

Time taken by train = 45min

Converting into hrs

Time taken by train = $\frac{45}{60} * 60 = 0.75hr$

Speed of train = $\frac{\text{Distance}}{\text{time}}$ = $\frac{69\ km}{0.73hr}$ = 92 km/hr

⇒ Ratio of speed of car and speed of train :

= $\frac{\text{Speed of car}}{\text{speed of train}}$

= $\frac{28.12\ km/hr}{92\ km/hr}$

= $\frac{2812}{100} * \frac{1}{92}$

= $\frac{30.56}{100}$

= $\frac{30156/100}{100}$

= $\frac{3056}{100} * \frac{1}{100}$

= 0.3056

Thus, ratio of speed of car and train is 0.3056 : 1