Aakash
Medical | IIT-JEE | Foundations

KNOWLEDGE BYTES

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CLASS 9

Aakash
Medical | IIT-JEE | Foundations

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PREFACE

What is Knowledge Bytes ?

Knowledge Bytes is a collection of riddles, interesting facts, mnemonics, and puzzles that will make your learning fun and engaging.

We want you to be delighted about studying. Knowledge Bytes helps you to know more about the subject in a fun, motivating and educational way and helps to implement what you learn in a creative way.

Benefits

Saves Time

Develops Learning Skills

Stimulates Interest

Leads to Increased Comprehension

EXPLORE

Number Systems

Crossword

ACROSS

4 Numbers that can be written in the form a/b (where a and b are both integers) and b is not equals to zero.

5 The set of all the rational and irrational numbers together.

6 A number that has three or more factors

7 A number that divides exactly the other number.

8 The set of counting numbers starting from 1.

10 Numbers that have only two factors.

11 The factors of a number that are prime numbers.

DOWN

1 Any non-negative integer i.e. 0, 1, 2, 3,

2 The set of all counting numbers including zero and negative of counting numbers.

3 Numbers whose decimal expansions are non-terminating and non-repeating.

9 The common factor of two (or more) numbers which has the greatest value.
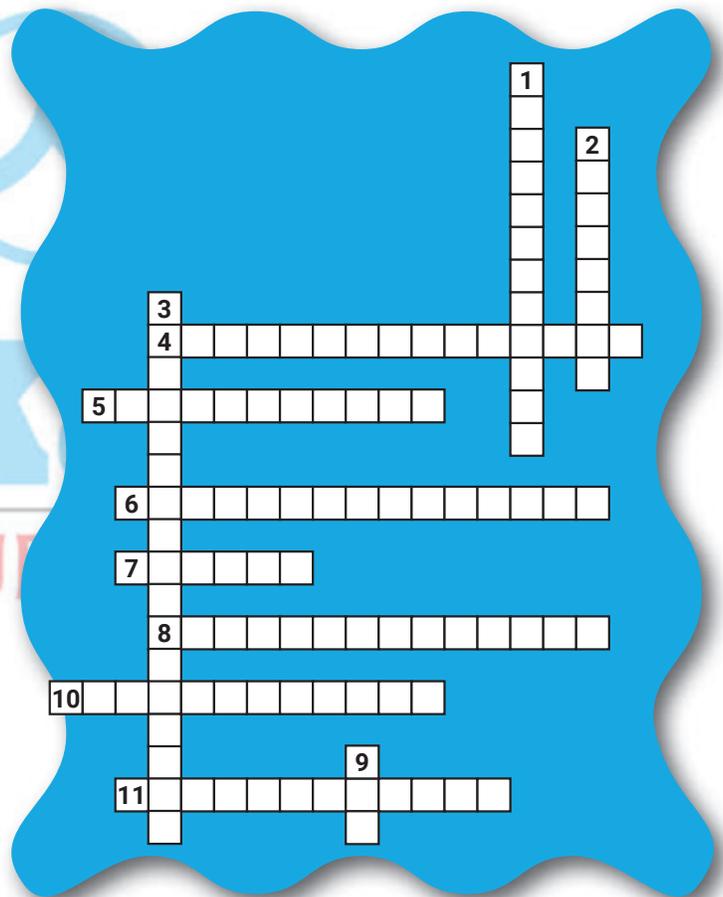
Golden Ratio in Nature

What is the golden ratio?

○ The golden ratio is a irrational number given as 1.6180339887..... and is represented by the Greek letter phi, Φ.

Relation between Fibonacci sequence and Golden Ratio

○ Fibonacci sequence is composed of the numbers which are sum of the previous two numbers in the sequence starting with 0 and 1.
E.g. 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ...

○ Golden ratio is best approximated by Fibonacci numbers. On dividing a Fibonacci number by a Fibonacci number preceding it, the number we get approximately equal to the golden ratio.

Do You Know

When the golden ratio is applied as a growth factor, you get a type of logarithmic spiral known as a golden spiral. Let us discuss few examples of golden spirals in nature.

👉 **Flower petals**

The number of petals in the flowers are generally a Fibonacci number. In order to optimize the filing, it is necessary to choose the most irrational number and golden number fits the best which allows for the best possible exposure to sunlight and other factors.

Seed Heads 👈
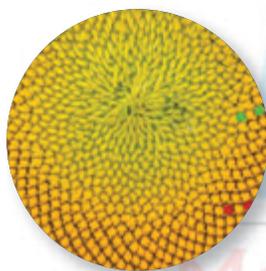
Seed formation of a sunflower is also an example of golden spiral i.e. number of spirals in clockwise and counter clockwise direction is generally a Fibonacci number as shown in the figure. The spiral pattern lets the flower fit the most seed heads in the least space.

👉 **Pine Cones**

Number of spirals in each direction of a pine cone will almost match a pair of consecutive Fibonacci numbers.

Faces 👈

We have perfect face if the proportions are equal to 1.618. The most "beautiful" smiles in humans are considered in which central incisors are 1.618 wider than the lateral incisors, which are 1.618 wider than canines, and so on.

👉 **Spiral galaxies**

The arms in the Milky way galaxy also follow the Fibonacci sequence.

In fact, the higher the Fibonacci numbers, the closer their relationship with 1.618. The golden ratio is sometimes called the "divine proportion," because of its frequency in the natural world.
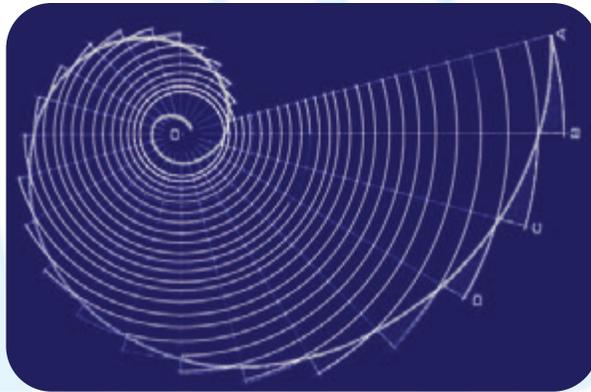
$$\phi = \frac{1 + \sqrt{5}}{2} = 1.6180339887498948482045868343 65$$

We have,

$$\frac{a}{b} = \frac{b}{a + b} \qquad \text{(golden ratio)}$$

$$a^2 + ab = b^2 \qquad \text{(cross multiplying)}$$

$$1 + \frac{b}{a} = \left(\frac{b}{a}\right)^2 \qquad \text{(dividing by } a^2)$$

$$\left(\frac{b}{a}\right)^2 - \frac{b}{a} - 1 = 0$$

$$\frac{b}{a} > 0 \quad \Rightarrow \quad \frac{b}{a} = \frac{1 + \sqrt{5}}{2}$$

Interesting Facts

Number Systems

👉 We all have heard about the Pythagoras theorem. But there is also something which is known as Pythagoras constant. The square root of 2 i.e. 1.41... was an irrational number to be discovered which is known as the Pythagoras constant.

👉 Mathematically, an even number is a number that can be divided into two smaller numbers which are actually whole numbers.

👉 There is only one number in the entire Hindu Arabic number system which can be spelled with the same number of letters as itself. That number is four.

👉 If you take any number and multiply it by three, then the answer you receive after adding the digits will always be divisible by three. For example: 3 x 4 = 12 or 1 + 2 = 3 or 3 / 3 = 1

👉 π is also known as the ratio of circumference to the diameter of a circle. It is a special number that is irrational. There is a designated day called Pi day, that we celebrate on March 14.

👉 The power of exponential growth is shocking. You can actually reach the moon by folding a paper of 0.01mm by 45 times.

1 What is meant by the term 'transcendental numbers'?

(a) a number which cannot be expressed in any finite series of arithmetic or algebraic operations

(b) a number whose exact value is not known, although incredibly accurate approximations are possible

(c) a number which cannot be written exactly in rational or decimal form

(d) all of these are descriptions of transcendental numbers, with varying degrees of precision

2 The first transcendental number to be discovered and used was π. It was the first number to be proven to be transcendental?

(a) Yes   (b) No

3 Is the square root of $2\sqrt{2}$ a transcendental number?

(a) Yes   (b) No

4 Which of the following is NOT a transcendental number?

(a) $\ln(2)$ (b) $e^{i\pi}$

(c) $\sqrt{e}$ (d) π^{e}

Answer (Crossword)

1 (down) WHOLENUMBERS

2 (down) INTEGERS

3 (down) IRRATIONALNUMBERS

4 RATIONALNUMBERS

5 REALNUMBERS

6 COMPOSITENUMBER

7 FACTOR

8 NATURALNUMBERS

9 (down) HCF

10 PRIMENUMBERS

11 PRIMEFACTORS

1 ▶ **(d)** all of these are descriptions of transcendental numbers, with varying degrees of precision

2 ▶ **(a)** Yes

3 ▶ **(b)** No

4 ▶ **(b)** $e^{i\pi}$

Crossword

ACROSS

6 If a body travels along a straight line in the same direction, then the distance travels by body is equal to its

8 The speed at a given point of time

9 Two or more forces act on an object at the same time, the forces combine to form

10 Forces on an object that are equal in magnitude and opposite in direction form

DOWN

1 The constant speed of an object in a fixed direction has uniform __

2 The distance travelled by an object per unit of time

3 The total distance travelled divided by the total time of travel

4 Total length of path travelled by an object is called

5 The rate of change of velocity

7 The tendency of an object to resist any change in its state of rest or of uniform motion on its own

9
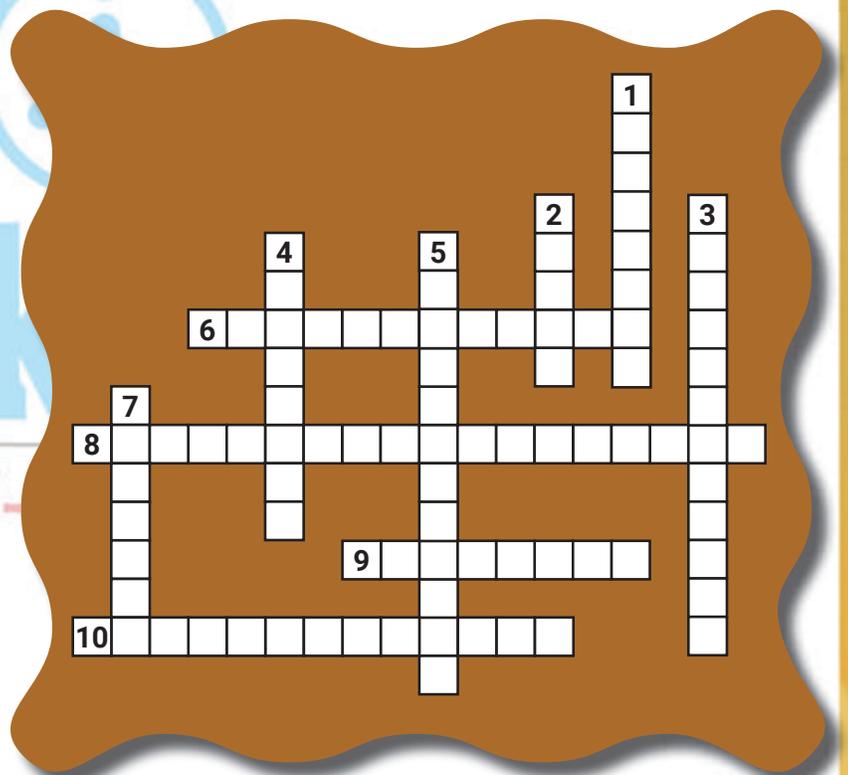
Interesting Facts

1 **Mechanics :** The branch of physics which deals with the study of motion of objects and their response to force is called mechanics.

2 **Distance :** The actual length of the path travelled by a moving body in a given interval of time irrespective of the direction in which the body travels is called the distance travelled by that body.

3 **Displacement :** The shortest distance (straight distance) measured between the initial position and the final position of moving body in a particular direction is called its displacement.

4 **Uniform motion :** A body moving in a straight line has a uniform motion if it travels equal distances in equal intervals of time, no matter how small these time-intervals may be.

5 **Non-uniform motion :** A body has a non-uniform motion if it travels unequal distances in equal intervals of time, no matter how small these time-intervals may be or its direction keep on changing.

6 **Average speed :** $\dfrac{\text{Total distance travelled}}{\text{Total time}}$

7 **Instantaneous speed :** The speed at any instant of time is called the instantaneous speed. It is equal to the magnitude of instantaneous velocity.

8 **Uniform velocity :** A body is said to have uniform velocity if it covers equal displacement in equal intervals of time, no matter how small these time intervals may be.

9 **Variable velocity :** A body is said to have variable velocity if it covers unequal distance in equal intervals of time in a particular direction, no matter how small these time-intervals may be, or if it covers equal distances in equal interval of time but its direction keep on changing or if both its direction and speed changes with time.

10 **Acceleration :** The rate of change of the velocity of a body with respect to time is called its acceleration.

11 **Retardation :** When acceleration of body is opposite to its velocity, it is called retardation.

12 **Distance-time graph :** A graph showing the distance covered with time is called distance-time graph.
- For a body moving with uniform speed: it is a straight line, inclined to the time-axis.
- For a body moving with non-uniform speed: it is a curve.
- For a body at rest: it is a straight line parallel to the time-axis.

13 **Velocity-time graph :** A graph showing the variation of velocity with time is called velocity-time graph.
- The shape of the velocity-time graph depends upon the nature of motion of the body.
- The slope of the velocity-time graph gives the acceleration of the body.
- The area under the velocity-time graph gives the displacement of the body in that interval of time.
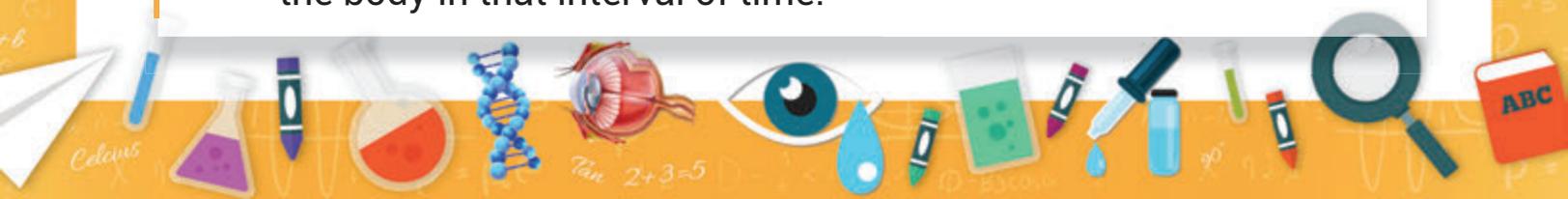
1 A particle is moving in a circular path of radius r. The displacement after half of a circle would be :

(a) Zero

(b) πr

(c) 2 r

(d) $2\pi r$

2 A body is thrown vertically upward with velocity u, the maximum height h to which it will rise is

(a) u/g

(b) $u^2/2g$

(c) u^2/g

(d) u/2g

3 The ratio of displacement to distance for a moving object is

(a) Always less than 1

(b) Always equal to 1

(c) Always more than 1

(d) Equal to or less than 1

4 If the displacement of an object is directly proportional to square of time, then the object moves with

(a) Uniform velocity

(b) Uniform acceleration

(c) Increasing acceleration

(d) Decreasing acceleration

5 For the given velocity- time graph, it can be inferred that the object is

(a) In uniform motion

(b) At rest

(c) In non-uniform motion

(d) Moving with uniform acceleration

Anwer (Crossword)

Across:
- 6 DISPLACEMENT
- 8 INSTANTANEOUSSPEED
- 9 NETFORCE
- 10 BALANCEDFORCE

Down:
- 1 VELOCITY
- 2 SPEED
- 3 AVERAGESPEED
- 4 DISTANCE
- 5 ACCELERATION
- 7 INERTIA
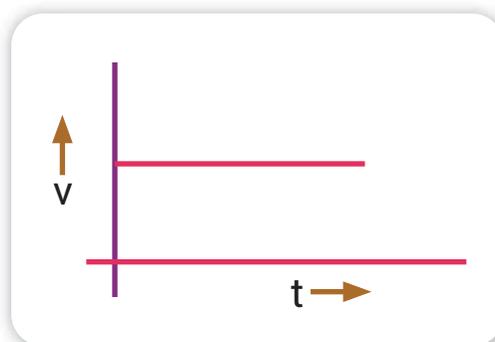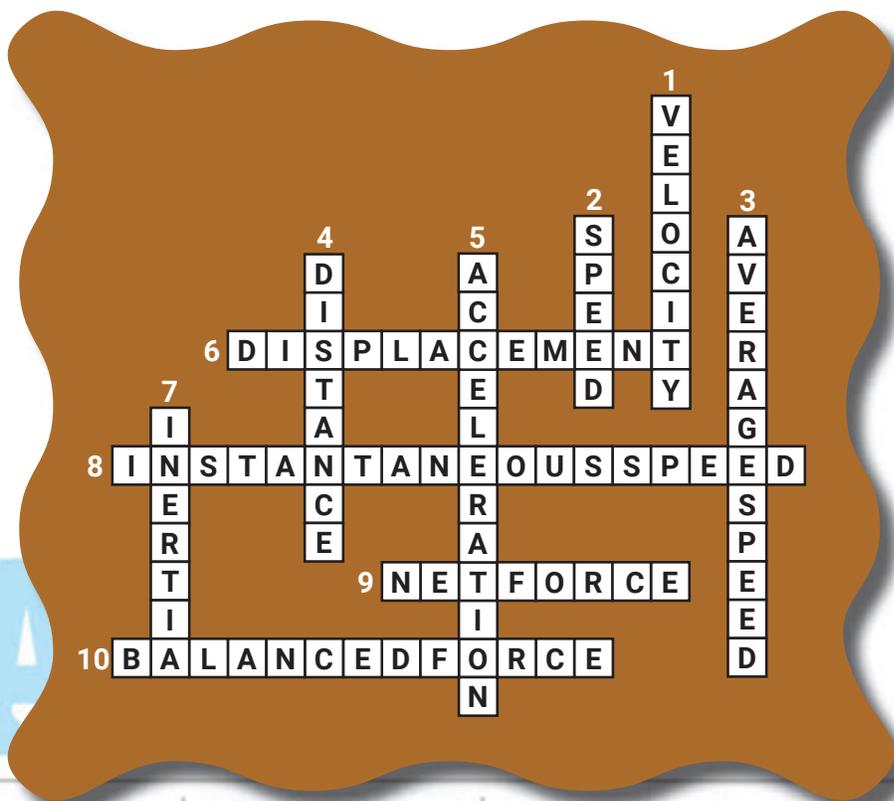
Answer Quiz Time

1 ⟩⟩ (c) 2 r

2 ⟩⟩ (b) $u^2/2g$

3 ⟩⟩ (d) Equal to or less than 1

4 ⟩⟩ (b) Uniform acceleration

5 ⟩⟩ (a) In uniform motion

Crossword

ACROSS

4 Reverse process of vaporization. [12]

6 State of matter which is electrically conductive. [6]

7 Conversion of liquid into its gaseous form below its boiling point. [11]

8 Solid carbon dioxide. [6]

9 Spontaneous intermixing of gases. [9]

DOWN

1 Rate of evaporation is inversely affected by this factor. [8]

2 State of matter for which shape is not fixed but volume is fixed. [6]

3 SI unit of temperature. [6]

5 Mixture of sodium chloride and ammonium chloride can be separated by [11]

10 The process in which water converts into ice. [8]

14

Interesting Facts

1
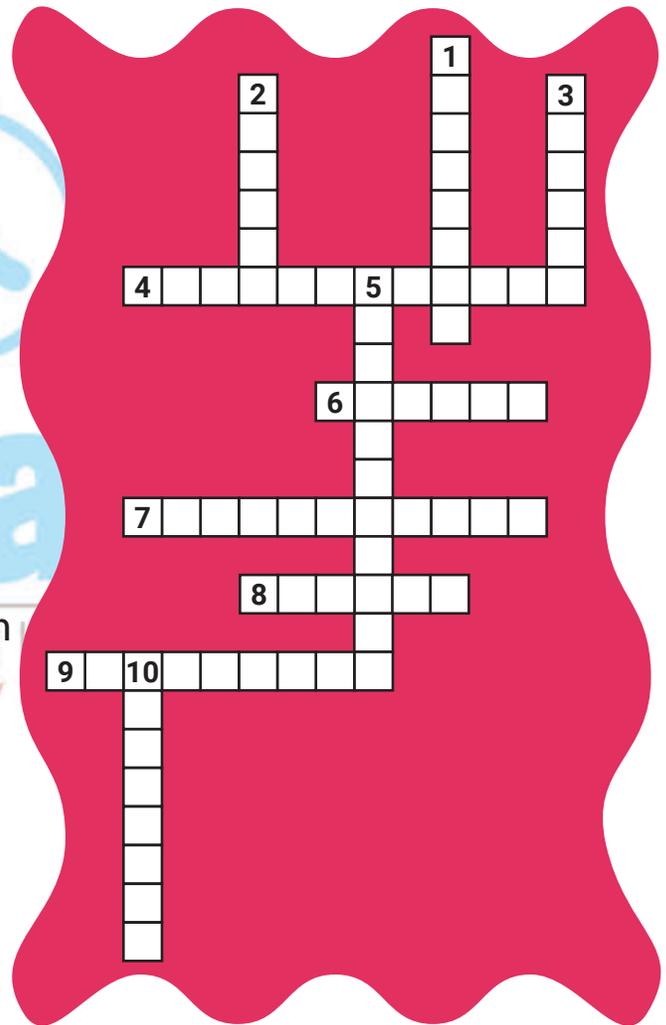
Drinks can be cooled by adding several cubes of ice in it. When ice melts, a large amount of heat is absorbed and this lowers the temperature of the drink.

2

Water has a large latent heat of vaporization. This property enables steam to be used for cooking by the method of steaming. When steam condenses on the food, the latent heat is released directly onto the food which enables the food to be cooked at faster rate.

3

Always be very careful while opening the lid of a pot when the water in it is boiling. Water has a large latent heat of vaporization. When steam condenses on the skin of your arm, a very large amount of latent heat is released which can cause a serious burn.

4 The freshness of fish and meat can be maintained by placing them in contact with ice. With its larger latent heat, ice is able to absorb a large quantity of heat from the fish as it melts. Thus, food can be kept at a low temperature for an extended period of time.

5 Our bodies feel cool after sweating because when sweat evaporates, it takes away heat from the body. As a result, the body is cooled.

Quiz Time

1 Which of the following is not a sublimable substance?

(a) NH_4Cl

(b) Anthracene

(c) Paracetamol

(d) Solid I_2

2 Which of the following states of matter doesn't exist at room temperature?

(a) Solid

(b) Liquid

(c) Gas

(d) BEC

3 An important ingredient of nail paint remover is

(a) Acetone

(b) Methyl alcohol

(c) Sulphuric acid

(d) Sodium hydroxide

4 Which of the following gases shows maximum diffusion rate?

(a) Oxygen

(b) Hydrogen

(c) Carbon dioxide

(d) Ozone

5 Absolute zero temperature is

(a) 0° C

(b) 0K

(c) − 273° C

(d) Both (b) and (c)

6 ➤➤ Identify a, b, c, d, e and f
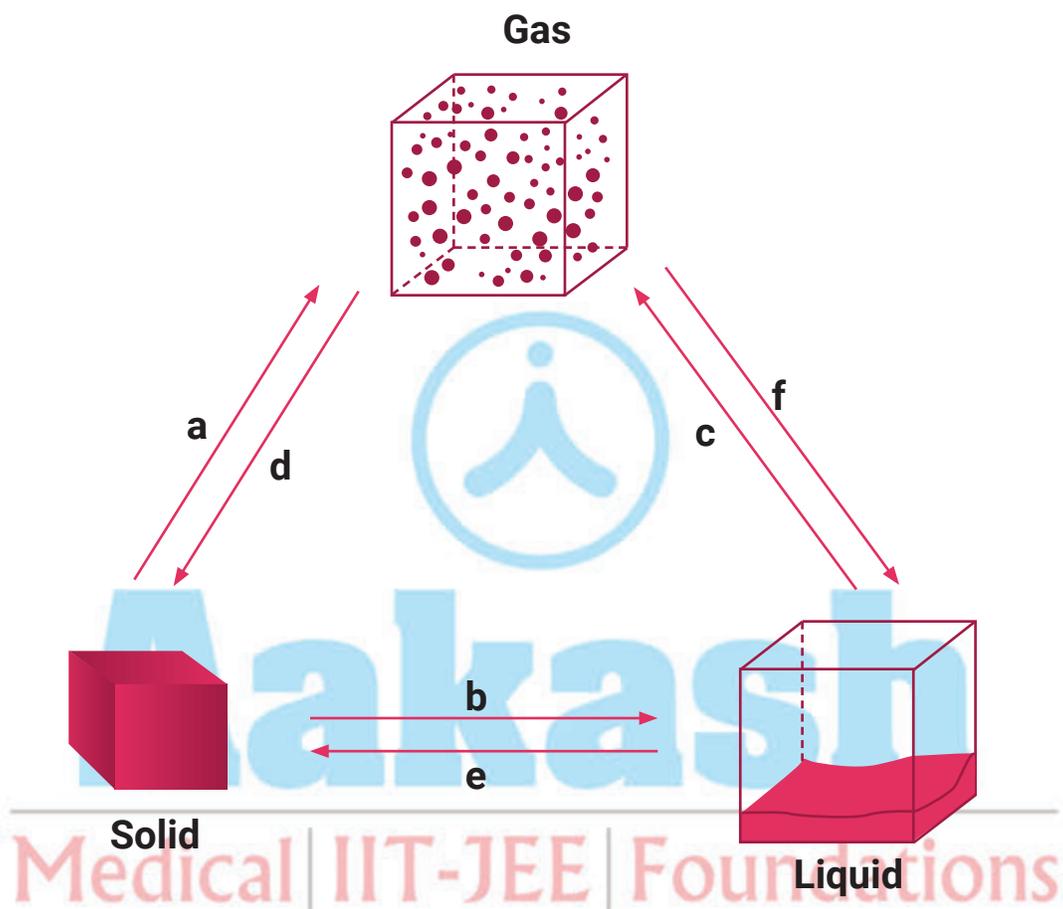
Gas

a

d

c

f

b

e

Solid

Liquid

Answer (Crossword)

```
                              1
              2               H               3
              L               U               K
              I               M               E
              Q               I               L
              U               D               V
              I         5     D               I
4  C O N D E N S A T I O N
              I         U               Y
                        B
                  6  P  L  A  S  M  A
                        I
                        M
           7  E V A P O R A T I O N
                        A
                  8  D  R  Y  I  C  E
                        T
        10              I
     9  D I F F U S I O N
        R
        E
        E
        Z
        I
        N
        G
```

Answer Quiz Time

1 ⟫ **(c)** Paracetamol   **2** ⟫ **(d)** BEC   **3** ⟫ **(a)** Acetone

4 ⟫ **(b)** Hydrogen   **5** ⟫ **(d)** Both (b) and (c)

6 ⟫

Gas

sublimation · deposition

condensation · vaporization

melting

freezing

Solid   **Liquid**
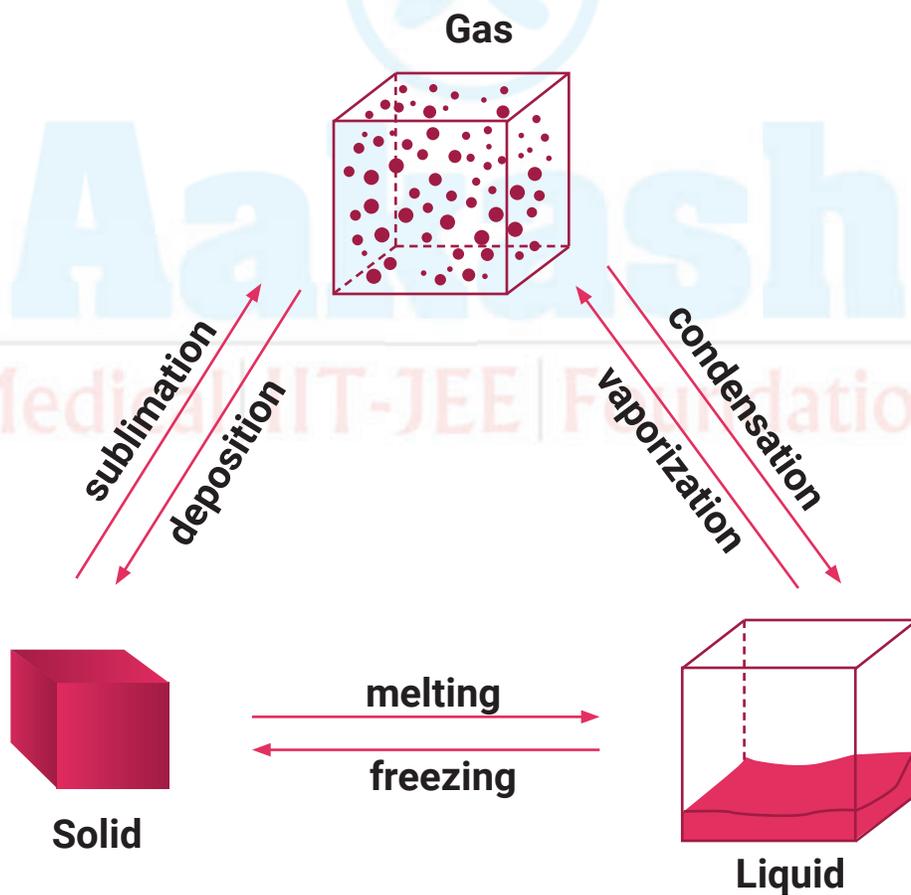
Crossword
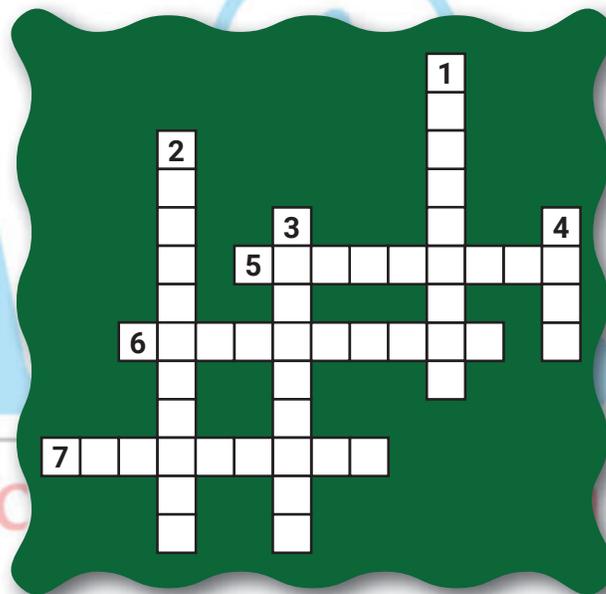
ACROSS

5 Substance that makes plant cell wall.

6 Organelle responsible for starch storage.

7 Organelle called suicidal bags.

DOWN

1 Smallest cell known.

2 Father of microbiology.

3 Respiratory structures in bacteria.

4 Unit of heredity.

Interesting Facts

Here are the hints given to help find you the answer.

When you have a sore throat, cells surrounding the throat are swollen because of excess water. The salt water which is used for gargling has a lower water concentration than the cells of the throat. So, water move from the swollen cells of the throat to the salt water; reducing pain and swelling.

While intaking salty food, saltier-than-normal blood rushes through blood vessels and the body senses an imbalance. Now, sodium-rich fluid attempts to pull even more fluid (water) out of the cells. The condition is known as hypernatremia, and it's a red flag that sends the signal to the brain to report the high salt levels in the fluid around the cells . "Water.. Water.. Water.." : signals the brain and you're thirsty.

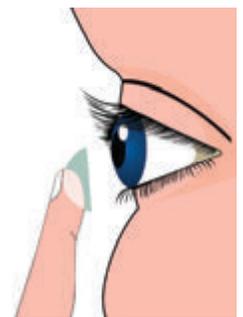Soft contact lenses are made up of semi-permeable materials. We store our contacts in sterile saline solution, such that the concentration of the saline in the contacts matches the salt content in the natural fluid which moistens our eyes; the contacts stay moist, soft and comfortable. But, if you store contacts in distilled water, the salt concentration is higher in the eye fluid and thus water flows out of the contacts; slowly drying the eyes.
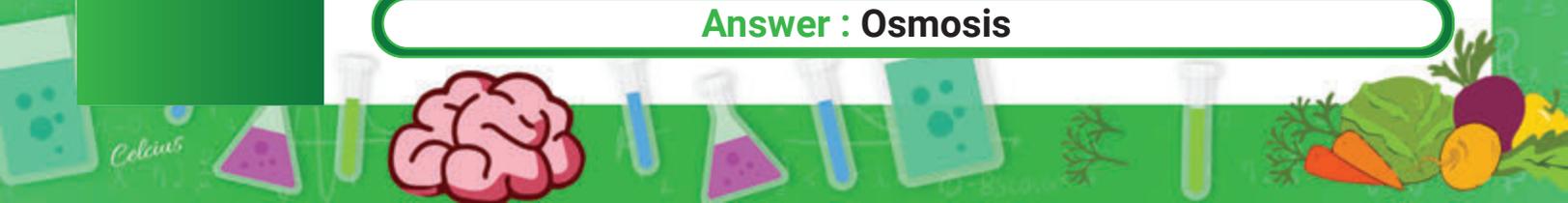
Q. Have you ever thought, HOW ?? 'Gargling Helps You Get Relieved From Sore Throat' or 'Reason Behind To Get Thirsty after eating salty food' or 'Moist contact lenses Saves Eyes as compared to Dry Contact Lenses'..?

Answer : Osmosis

Some Historical backgrounds

Leeuwenhoek, born in Delft, Holland on October 24, 1632, son of a basket-maker, although did not receive a university education, but he has some of the most important discoveries in the history of Biology.

He apprenticed as a fabric merchant but at some time before 1668, A. V. Leeuwenhoek learned how to grind lenses, and utilised these to make very simple hand-held microscopes. But these microscopes were not compound microscopes made up of two or more lenses, rather refined magnifying glasses made with finely ground lenses. These microscopes, along with proper lighting, helped to magnify objects over 275 times. Leeuwenhoek hired an illustrator to draw what he saw, eg: plant cells, protists, various types of algae and was the first person to view bacteria (discovered while viewing scrapings from his teeth and the teeth of others) which he termed "animalcules". Also, he discovered blood cells and was the first to view living sperm cells in animals.
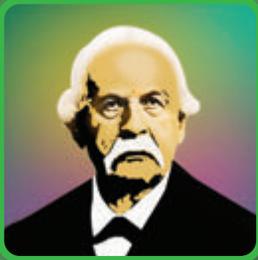
A German scientist, **Richard Altmann** developed a better way of tissue preservation for examining under the microscope. He used an *acid-fuchsin tissue* stain and he could then see filaments which were looking like strings of granules within nearly all cells. He then named these structures as Bioblasts (around year 1890). Also, based on the research, he proposed that the granules were basic living units within cells that were responsible for metabolic processes.

On Further Discovery, in 1898, **Carl Benda**, published results from using another stain, *crystal violet*, for studying cells under the microscope. Further investigation on Altmann's bioblasts, he observed structures that sometimes looked like threads and at other times resembled granules. He then coined the term "mitochondrion" for them, derived from the Greek words : "mitos," and "chondros'', which means "thread" and "granule," respectively.

Rearrange the words

1. O S T P A M L P O R

HINT : Physical basis of life

2. M O N H A C I O R T D I

HINT : Power house of cell

3. E L C I O T N R E

HINT : Organelle responsible for cell division

4. U N C L U E L S O

HINT : Ribosome factory

5. M I A H A O G R R P I C

HINT : Book written by Robert Hooke

Jumbled words

Find out the correct answer among the jumbled alphabets by using the hints below.

1. Smallest cell organelle

2. Fluid present inside nucleus

3. Membrane of vacuole

4. Organelle that produce enzyme catalase

5. Green pigment in plants

W	M	Q	N	Z	X	M	E	C	T	Y	X	B	F	U	U
I	N	C	X	T	Y	S	Q	B	H	Z	H	Y	W	X	E	B
O	Y	H	X	E	J	N	U	N	R	I	Z	C	I	P	R	Z
T	E	X	I	S	S	Y	F	U	O	F	U	A	P	Z	U	Y
V	U	O	F	T	E	J	S	C	X	N	X	Y	M	I	L	D
R	B	D	W	O	C	V	E	L	I	E	V	U	T	O	Z	H
I	V	S	S	D	U	B	E	N	B	D	V	T	P	T	D
B	S	R	J	T	Y	T	A	O	E	E	Q	K	R	Z	O	W
O	D	I	K	E	S	E	C	P	W	L	V	H	I	E	N	R
S	I	T	O	R	O	T	E	L	O	R	M	O	N	E	O	S
O	A	S	T	O	N	D	O	A	G	T	O	X	K	D	P	M
M	B	H	K	N	E	T	U	S	J	N	Q	S	N	O	L	D
E	E	F	E	E	S	W	S	M	Q	X	P	A	K	D	A	F
K	T	Z	P	E	R	O	X	I	S	O	M	E	U	H	S	J
Z	E	C	H	L	O	R	O	P	H	Y	L	L	P	A	T	M
Z	S	I	G	R	Y	M	E	N	A	R	C	H	E	I	A	A
B	F	P	A	I	Q	L	A	Q	Y	N	E	V	I	A	Z	N

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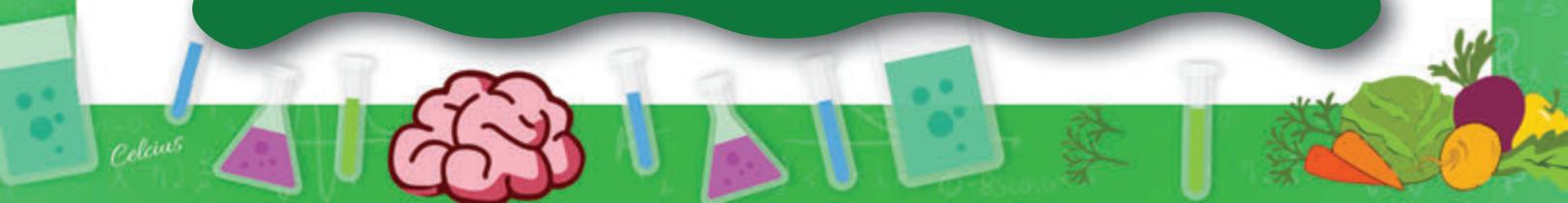
Riddles

I'm a series of tubes
found throughout the cell.
I prepare proteins
And lipids as well.
What am I? _____

7

I'm full of holes,
flexible and thin.
I control what gets out
as well as what comes in.
What am I? _____

2

I've been called the storage tank
by those with little taste.
I'm a sack filled with water,
food, enzymes, and waste.
What am I? _____

3

Since I contain many enzymes,
I can digest an injured cell
and can break down a large molecule
(like a protein) into a smaller one as well.
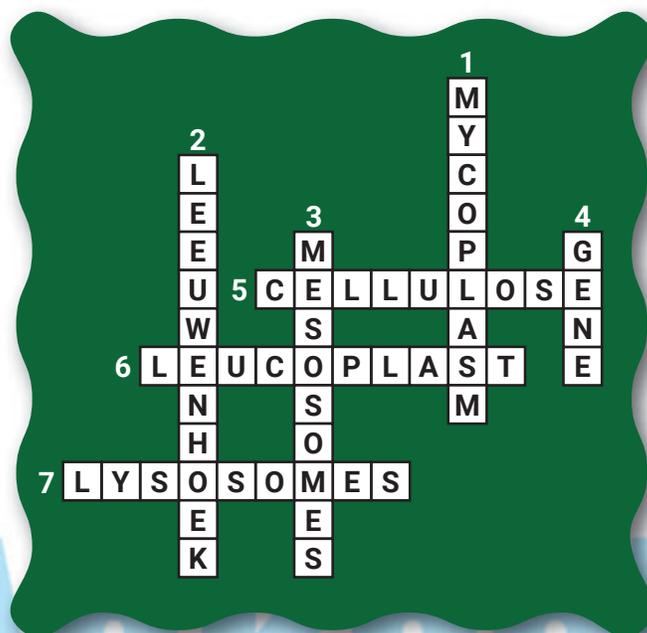What am I? _____

4

My name means coloured bodies
and I contain DNA,
I pass on traits to new cells
in a systematic way.
What am I? _____

5

Answer (Crossword)

Down:
1. MYCOPLASM
2. LEEUWENHOEK
3. MESOSOMES
4. GENE

Across:
5. CELLULOSE
6. LEUCOPLAST
7. LYSOSOMES

Answer (Rearrange the words)

1. PROTOPLASM
2. MITOCHONDRIA
3. CENTRIOLE
4. NUCLEOLUS
5. MICROGRAPHIA

Answer (Jumbled words)

W	M	Q	N	Z	X	M	E	C	T	Y	X	B	F	U	U
I	N	C	X	T	Y	S	Q	B	H	Z	H	Y	W	X	E	B
O	Y	H	X	E	J	N	U	N	R	I	Z	C	I	P	R	Z
T	E	X	I	S	S	Y	F	U	O	F	U	A	P	Z	U	Y
V	U	O	F	T	E	J	S	C	X	N	X	Y	M	I	L	D
R	B	D	W	O	C	V	E	L	I	E	V	U	T	O	Z	H
I	V	S	S	S	D	U	B	E	N	B	D	V	T	P	T	D
B	S	R	J	T	Y	A	O	O	E	E	Q	K	R	Z	O	W
O	D	I	K	E	S	E	C	P	W	L	V	H	I	E	N	R
S	I	T	O	R	O	T	E	L	O	R	M	O	N	E	O	S
O	A	S	T	O	N	D	O	A	G	T	O	X	K	D	P	M
M	B	H	K	N	E	T	U	S	J	N	Q	S	N	O	L	D
E	E	F	E	E	S	W	S	M	Q	X	P	A	K	D	A	F
K	T	Z	P	E	R	O	X	I	S	O	M	E	U	H	S	J
Z	E	C	H	L	O	R	O	P	H	Y	L	L	P	A	T	M
Z	S	I	G	R	Y	M	E	N	A	R	C	H	E	I	A	A
B	F	P	A	I	Q	L	A	Q	Y	N	E	V	I	A	Z	N

Answer (Riddles)

1 Endoplasmic Reticulum

2 Cell Membrane

3 Vacuole (Large)

4 Lysosome

5 Chromosomes

Socialism in Europe

Socialism is a political, social, and economic philosophy which consists of socio-economic systems characterised by social ownership of the means of production.

Origin of Socialism

With the advent of the French Revolution the idea of socialism got its root in Europe. Although the idea of collective society was first given by the Greek philosopher Plato in his dialogue 'Republic'.

Role of Communist League

In 1847, in London, a political party named the Communist League was established by Karl Marx.

Which carried the slogan "All men are brothers".

In 1847, it declared its aim as "the downfall of the bourgeoisie, the rule of the proletariat, the overthrow of the old society of middle class, based on class distinction, and establishing a new society without classes and private property".

It was formally disbanded in 1852.

Do You Know

Marx and Friedrich Engels drafted a manifesto which is popularly known as the Communist Manifesto.
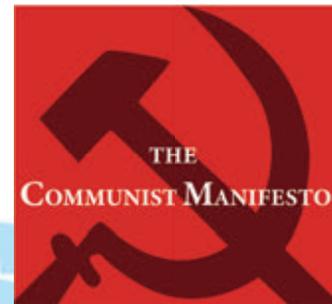
Marxian Socialism

According to the Marxist

Workers produce more 'value' than they get in the form of wages. This constitutes the basis of conflict in capitalist society. Thus economic crisis was inevitable under capitalism because of the discrepancy between the purchasing power of workers and total production.

These crises would be resolved only if the private ownership of the means of production is abolished and the profit motive eliminated from the system of production.

These ideas were propagated in Europe and spread like a fire in the jungle and motivated the workers' class to revolt against the capitalist class.

Formation of First International, 1864

International Working Men's Association, or the First International 1864 was first international organisation which aimed at uniting communist, socialist and anarchists.

In 1876, due to differences in views, the organisation lost its importance.

Formation of Second International, 1889

To unite the socialist parties in various countries into an international organisation, a Congress was held in Paris on 14 July 1889; this was the Second International.

Achievements of second international:

• Campaign against militarism and war

• Focusing on the principle of remove essential equality of all the people

• Focus on the right to freedom and national independence

Conclusion

It also emerged as a power against the problems created by capitalism. Socialism was the need of the 19th century. With time it evolved as a decisive factor along with democracy and nationalism.

Do You Know

The word socialist was added in the preamble of the Indian Constitution under 42nd CAA 1976.

Quiz Time

1 Which of the following depicts the most appropriate meaning of the word proletariat?

(a) Capitalist Class   (b) Workers Class

(c) Nobility   (d) Aristocracy

2 Who is known as the father of scientific socialism?

(a) Henri de Saint-Simon   (b) Blanqui

(c) Karl Marx   (d) Robert Owen

3 Who wrote Communist Manifesto?

(a) Robert Owen   (b) Blanqui

(c) Charles Fourier   (d) Karl Marx

4 A political organisation, Second International was formed in:

(a) 1864   (b) 1889

(c) 1900   (d) 1904

5 Which of the following ideas socialism focuses on?

(a) Public Ownership   (b) Equality of Income Distribution

(c) Central Planning   (d) All of these

Answer Quiz Time

1 ➤ (b) Workers Class

2 ➤ (c) Karl Marx

3 ➤ (d) Karl Marx

4 ➤ (b) 1889

5 ➤ (d) All of these

Time to work on 'Vocabulary'

Synonyms/Closest Word

1 Overseer

  (a) Furnace   (b) Financer   (c) Fiancé   (d) Supervisor

2 Drench

  (a) Lead   (b) Soak   (c) Coarse   (d) Pedestal

3 Alighted

  (a) Climb   (b) Down   (c) Descend   (d) Fly

4 Stirring

  (a) Wander   (b) Move   (c) Dull   (d) Sleep

5 Plead

  (a) Beg   (b) Claim   (c) Monarch   (d) Abandon

Antonyms/Farthest Word

1 **Thrall**

(a) Master   (b) Captive   (c) Father   (d) Son

2 **Enormous**

(a) Cosmic   (b) Whopping   (c) Tiny   (d) Gigantic

3 **Rapt**

(a) Spellbound   (b) Captivated   (c) Lost   (d) Uninterested

4 **Garish**

(a) Flashy   (b) Harsh   (c) Tasteful   (d) Bilious

5 **Whack**

(a) Thump   (b) Knock   (c) Hit   (d) Revive

Answers

Synonyms/Closest Word

1 **Overseer**

(a) Furnace   (b) Financer   (c) Fiancé   (d) **Supervisor** ✓

2 **Drench**

(a) Lead   (b) **Soak** ✓   (c) Coarse   (d) Pedestal

3 **Alighted**

(a) Climb   (b) Down   (c) **Descend** ✓   (d) Fly

4 **Stirring**

(a) Wander   (b) **Move** ✓   (c) Dull   (d) Sleep

5 **Plead**

(a) **Beg** ✓   (b) Claim   (c) Monarch   (d) Abandon

Answers

Antonyms/Farthest Word

1 **Thrall**

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5 **Whack**

(a) Thump   (b) Knock   (c) Hit   (d) **Revive** ✓

Quantitative Aptitude: Alligation and Mixture

1 ⟩⟩ The average weight of girls is 10 kg and the average weight of boys is 20 kg. The average weight of boys and girls both is 18 kg. If the number of boys are 16, then the number of girls are

(a) 4   (b) 6

(c) 5   (d) 3

2 ⟩⟩ 5 kg of superior quality of rice is mixed with 20 kg of inferior quality rice. The price of superior quality and inferior quality rice is ₹ 16 and ₹ 12 respectively. The average price of per kg of the mixure is

(a) ₹ 12.5   (b) ₹ 12.8

(c) ₹ 13   (d) ₹ 12

3 ⟩⟩ A truck agency has 100 trucks. They sold some truck at 10% profit and rest at 30% profit. Thus they gains 15% on the sale of all his trucks. The number of trucks sold at 30% profit is

(a) 20   (b) 30

(c) 25   (d) 28

4 ⟫ The ratio of water and milk in two different containers is 2 : 3 and 6 : 4. In what ratio we are required to mix the mixture of the containers in order to get the new mixture in which the ratio of milk and water be 3 : 4.
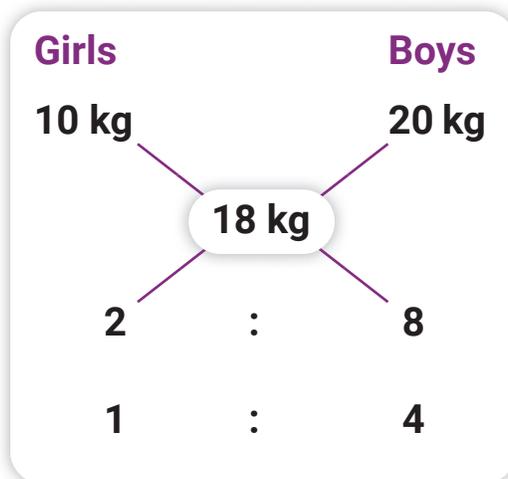
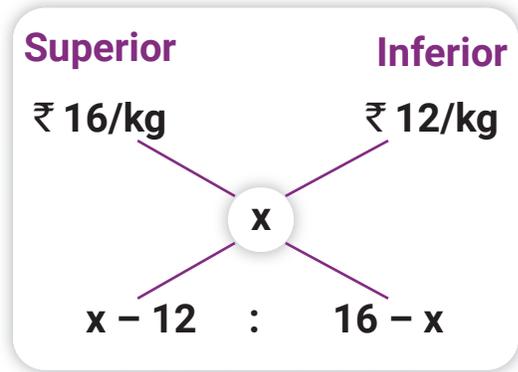(a) 6 : 5

(b) 2 : 5

(c) 1 : 7

(d) 1 : 6

Answer Quiz Time

1 ⟫ (a) 4

Girls	Boys
10 kg	20 kg

18 kg

2 : 8

1 : 4

4 : 16   ⟹   1 : 4

No. of girls = 4

2 ⟫ **(b)** 12.8

Superior	Inferior
₹ 16/kg	₹ 12/kg

x

x − 12 : 16 − x

$$\frac{x - 12}{16 - x} = \frac{5}{20}$$

$$\Rightarrow \quad 4x - 48 = 16 - x$$

$$x = ₹ 12\frac{4}{5} \text{ /kg}$$

4 ⟫ **(d)** 1 : 6

I	II
$\frac{2}{5}$	$\frac{6}{10}$

$\frac{4}{7}$

$\frac{6}{10} - \frac{4}{7}$ $\frac{4}{7} - \frac{2}{5}$

$\frac{2}{70}$ $\frac{6}{35}$

2 : 12

1 : 6

3 ⟫ **(c)** 25

10%	30%

15%

15 : 5

3 : 1
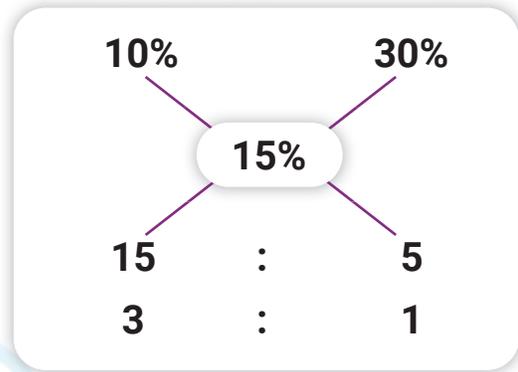
$$(3 + 1) \quad \rightarrow \quad 100$$

$$1 \quad \rightarrow \quad 25$$

No. of trucks sold at 30% profit = 25 % of 100

$$= 25$$

Happy Birthday

Johannes Kepler
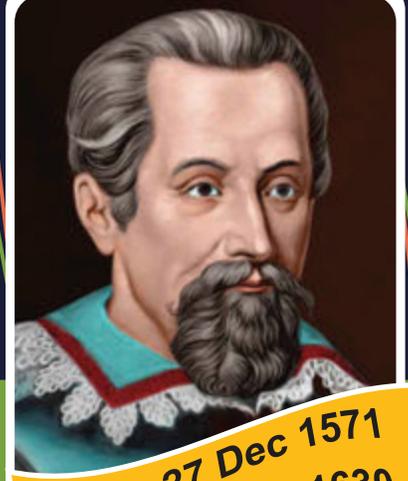
Born - 27 Dec 1571
Died - 15 Nov 1630

December 27 is a day to celebrate the life of astronomer Johannes Kepler, who was born on this date in 1571, and is best known for his three laws of planetary motion. But also, coming up in 2009. The International Year of Astronomy (IYA) will celebrate the work of Kepler as well. Not only did Galileo begin his observations with a telescope almost 400 years ago in 1609, but also in that year Kepler published his book New Astronomy or Astronomia Nova. This was first published work that documented the scientific method.

OUR RESULTS 2024

NEET (UG) 2024

AIR 1

State Topper	State Topper	State Topper	State Topper	State Topper	State Topper
Delhi	Uttar Pradesh	West Bengal	Uttar Pradesh	Maharashtra	Rajasthan
720/720	720/720	720/720	720/720	720/720	720/720
Mridul M Anand	Ayush Naugraiya	Arghyadeep Dutta	Aryan Yadav	Palansha Agarwal	Iram Quazi
3 Year Classroom	4 Year Classroom	2 Year Classroom	1 Year Classroom	2 Year Classroom	1 Year Classroom

JEE (Advanced) 2024

AIR 25	AIR 67	AIR 78	AIR 93	AIR 95
Rishi Shekher Shukla	Krishna Sai Shishir	Abhishek Jain	Hardik Aggarwal	Ujjwal Singh
2 Year Classroom	4 Year Classroom	4 Year Classroom	2 Year Classroom	4 Year Classroom

1430 Students Scored Above MAS

344 Classroom Students **Qualified in NSEs* 2023-24**

- (Group A & B) **34+30** NSEA*
- **156** NSEB*
- **72** NSEC*
- **23** NSEP*
- **29** NSEJS*

Aakashians Qualified for INO-2024

Diptanshu Sharma	Priyanshu Sarkar	Mridul Garg	Zaman Hussain	Shubhradeep Paul	Samvit Shandilya
NSEB | NSEC | NSEP	NSEB | NSEC | NSEP	NSEB | NSEC | NSEP	NSEA | NSEC | NSEP	NSEA | NSEC | NSEP	NSEA | NSEC | NSEP

and many more...

*NSEA-National Standard Examination in Astronomy | NSEB-National Standard Examination in Biology | NSEC-National Standard Examination in Chemistry
NSEP-National Standard Examination in Physics | NSEJS-National Standard Examination in Junior Science | INO-Indian National Olympiad

Aakashians Qualified for OCSC/IMOTC-2024

32 Classroom Students **Qualified in INOs 2024**

Aneesh Shastri	Sanvi Jain	Mridul M Anand	Zaman Hussain	Sushant Agarwal	Archit Kumar
Qualified INAO	Qualified INChO	Qualified INBO	Qualified INMO	Qualified INJSO	Qualified INAO Jr

and many more...

OCSCs - Orientation cum Selection Camps | **IMOTC** - International Mathematical Olympiad Training Camp

Aakashians Qualified for RMO from Classroom Programs

869 Classroom Students **Qualified in IOQM 2024**

Class VIII Joish Achyuta	Class VIII Pranava NS	Class VIII Bruteshwar Rajguru	Class VIII Hardik Mishra	Class VIII Hardik Dhariwal	Class IX Dhanush Damu
2 Year Classroom	3 Year Classroom	3 Year Classroom	2 Year Classroom	2 Year Classroom	4 Year Classroom

and many more...

IOQM - Indian Olympiad Qualifier in Mathematics

Board Exam Results 2024

Top Performers from Class X

Devidyuti K Pisharody	P Harini	Jiya Dugar V
Marks 500/500	Marks 499/500	Marks 498/500
CBSE	CBSE	CBSE

and many more...

Top Performers from Class XII

Ananthan R	Ansh Agrawal	Himanshu Agarwal
Marks 496/500	Marks 495/500	Marks 495/500
CBSE	CBSE	CBSE

and many more...

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