Aakash
Medical | IIT-JEE | Foundations

KNOWLEDGE BYTES

MARCH 2025

CLASS 8

Aakash
Medical | IIT-JEE | Foundations

Edition: 2024-25

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

Data Handling

Let's decode pictograph!!

Q. The given pictograph shows the favourite fruit of some students of a school. One symbol for each fruit stands for 50 students.

Fruits	Number of Students
Mango	🥭 🥭 🥭 🥭 🥭 🥭
Banana	🍌 🍌 🍌 🍌
Pineapple	🍍 🍍 🍍
Orange	🍊 🍊 🍊 🍊 🍊
Kiwi	🥝 🥝 🥝 🥝 🥝 🥝

(i) Find the number of students whose favourite fruit is orange.

(ii) Find the difference between the percentage of students whose favourite fruit is Banana and Kiwi.

Probability

Probability : Probability is defined as the extent to which an event is likely to occur.

Probability of occurrence of an event is given by :

$$P(E) = \frac{\text{Number of favourable Outcomes}}{\text{Total Number of Outcomes}} \quad \text{...(i)}$$

where 'E' is any event.

What is the probability of getting six ?

What is the probability of raining today ?

Total number of outcomes ≥ Number of favourable outcomes

$0 \leq P(E) \leq 1$
This means denominator is either greater than or equal to numerator in equation (i).

$P(E) = 0$, if there are no favourable outcomes, then E is called **Impossible event**.

P(E) can never be negative.

$P(E) = 1$, if number of favourable outcomes is equal to the total number of outcomes, then E is called **Sure event**.

Sum of probabilities of all possible outcomes is 1

Negation of an event :
Let 'E' be any event and its probability is P(E), then an event 'not E' occurs when and only when 'E' does not occur and vice versa.
Probability of 'not E' is given as $P(\bar{E})$.
So, $P(\bar{E}) = 1 - P(E)$

3

Concept of Playing Cards

A deck has 52 playing cards.

52 Playing Cards

26 Red Cards

26 Black Cards

♥ Hearts (13 Cards)

♦ Diamonds (13 Cards)

♣ Clubs (13 Cards)

♠ Spades (13 Cards)

Heart, Diamond, Spade, Club are called suits. Each suit has 13 cards which include 1 King, 1 Queen, 1 Jack, 1 Ace and number cards from 2 to 10.
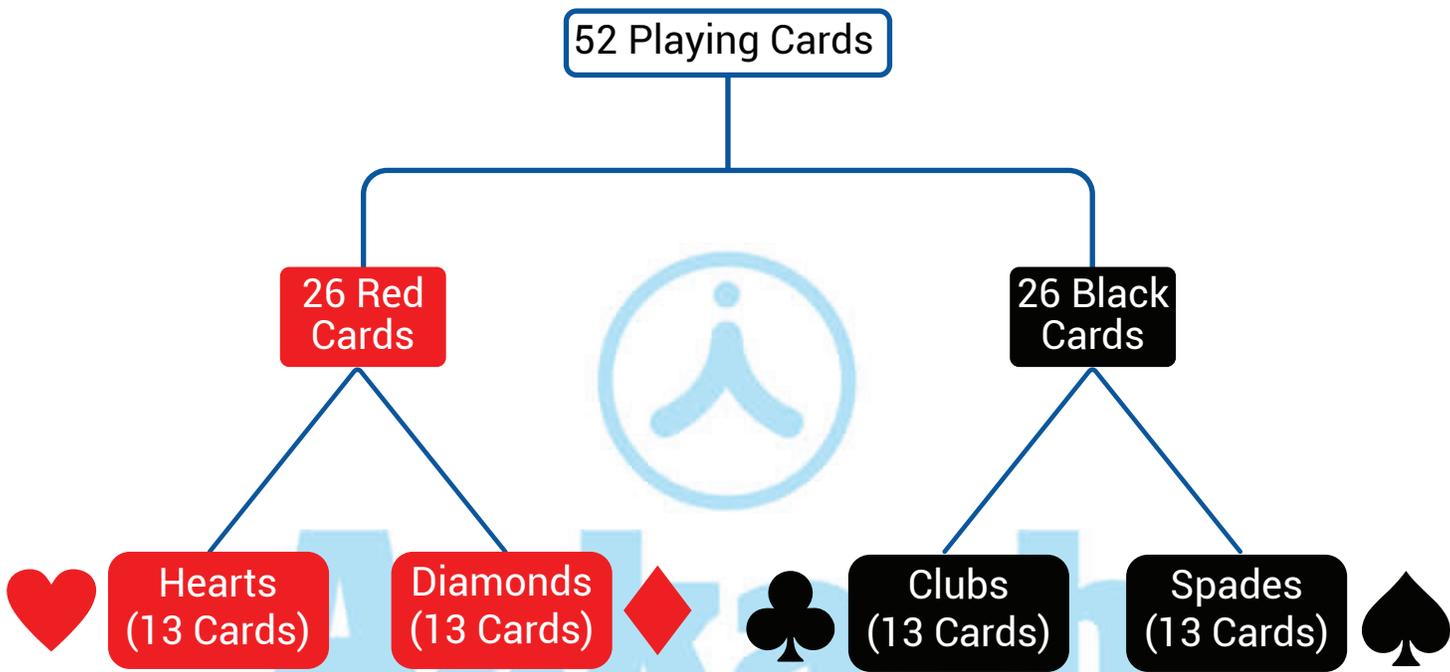
Q. **What are face cards?**

KING   QUEEN   JACK

King, Queen and Jack are called face cards.

Q. **What are Honour cards?**

King, Queen, Jack and Ace are together called Honour cards.

KING   QUEEN   JACK   ACE

Pictograph (Solution)

(i) Number of students whose favourite fruit is orange are 5 × 50 = 250

[∵ There are 5 oranges and 1 orange represents 50 students.]

(ii) Number of students whose favourite fruit is banana and kiwi are respectively 4 × 50 = 200 and 6 × 50 = 300

Percentage of students whose favourite fruit is banana = $\dfrac{200}{1200} \times 100 = \dfrac{100}{6}$%

and percentage of students whose favourite fruit is kiwi = $\dfrac{300}{1200} \times 100 = 25$%

∴ Difference in percentages = $25 - \dfrac{100}{6} = \dfrac{25}{3}$%

Crossword (Sound)

Across

3. _____ sounds have frequencies higher than 20,000 hertz.

7. _____ is an electronic version of echolocation used by bats and dolphins.

8. The loudness of sound is measured in units of _____

10. The sound vibrations are changed into electrical signals in the _____

15. Noise which reaches to a level that can cause pain, discomfort or damage to the ears is called _____

16. A _____ is an explosive sound that is heard, when a shock wave reaches your ears.

18. The characteristic of sound which differentiates between two sounds of equal loudness is known as _____

19. All sound waves need a _____ to travel through, such as air.

20. _____ is the result of two or more waves overlapping.
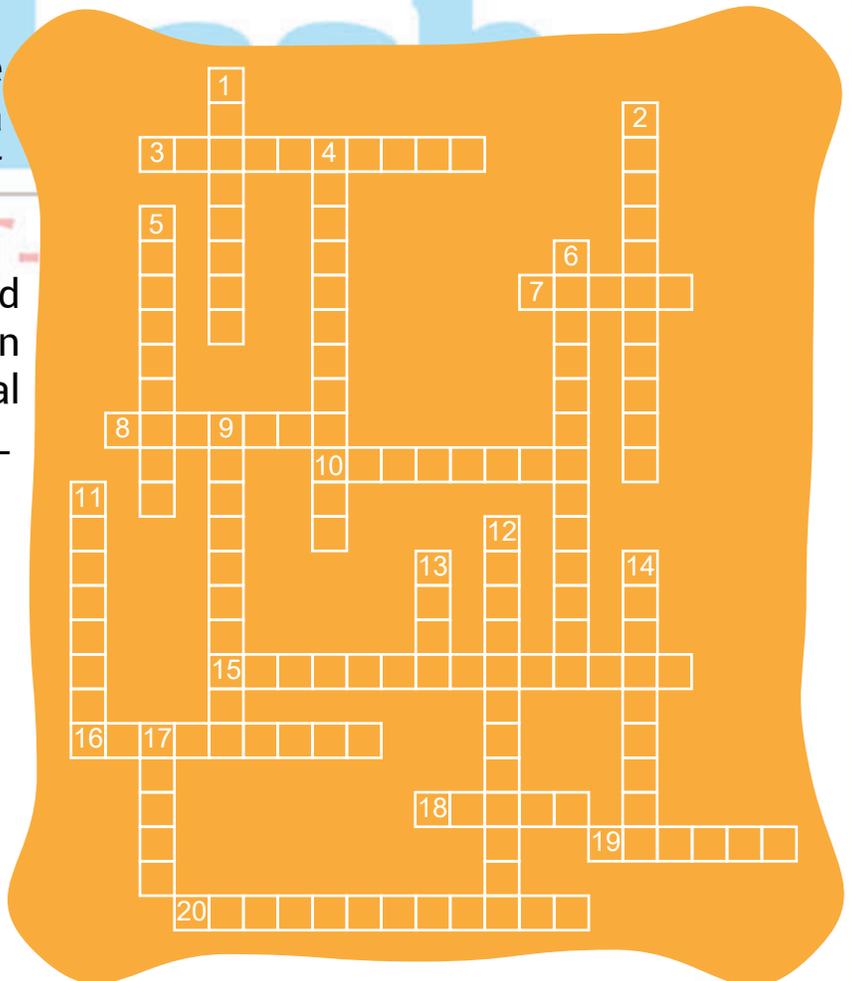
Down

1. The _____ acts as a funnel for sound waves.

2. _____ is the bending of waves around barriers or through openings.

4. The result of blending several pitches together is called _____

5. The _____ contains the hammer, anvil and stirrup bones which increase the vibrations.

6. The _____ causes sounds to change its pitch as it move closer to the listener.

9. Sounds with frequencies lower than 20 hertz are called _____

11. _____ is how loud or soft a sound is perceived to be.

12. Technique used by some animals to find food by using reflected sound waves is called _____

13. An _____ is the repetition of the original sound heard after the sound is reflected from a distant, dense and rigid object.

14. _____ occurs when a vibrating object causes another nearby object to start vibrating at a higher amplitude.

17. _____ can be described as any undesirable sound.

Answers: Crossword (Sound)

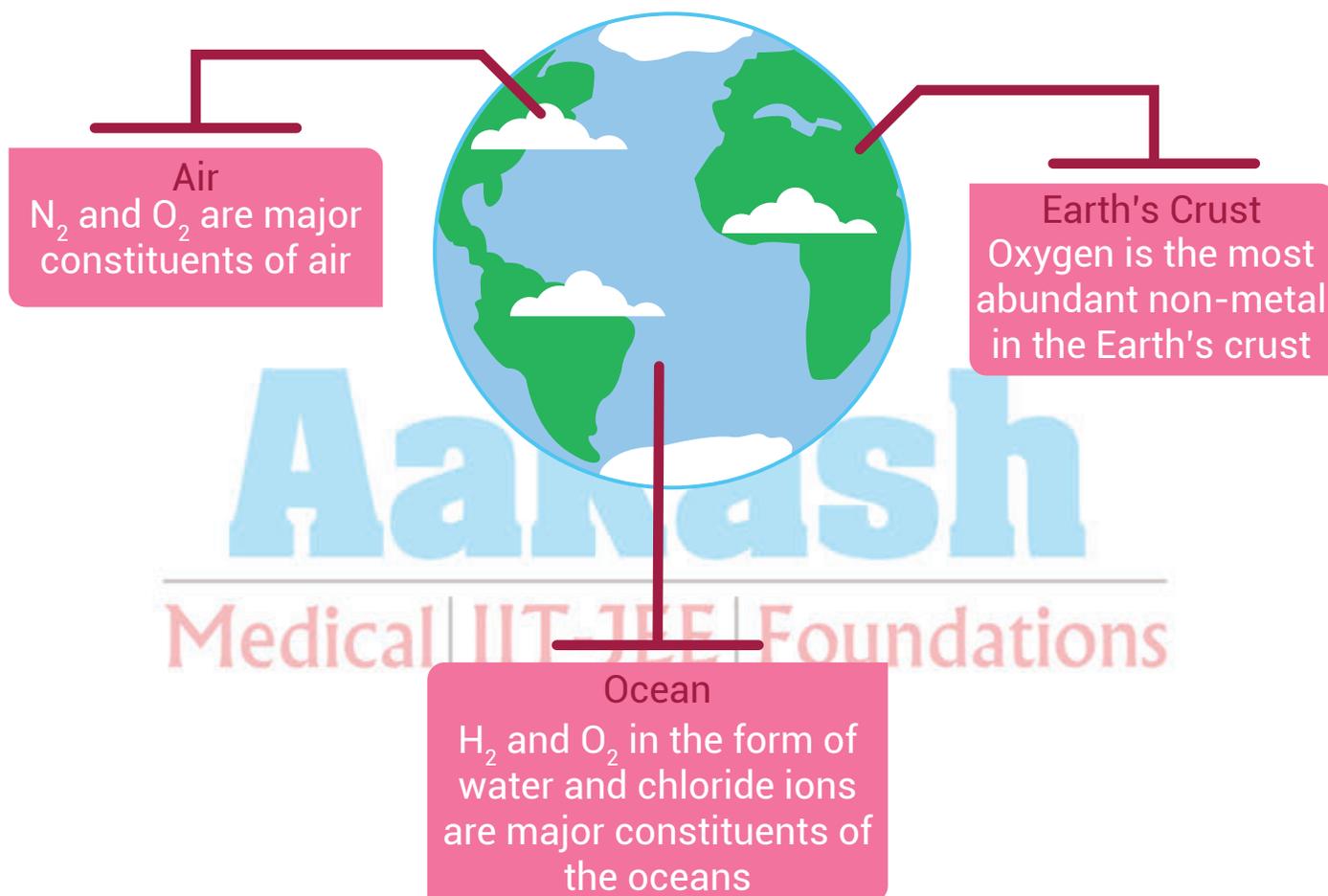|			
1. Outer Ear	6. Doppler Effect	11. Loudness	16. Sonic Boom
2. Diffraction	7. Sonar	12. Echolocation	17. Noise
3. Ultrasonic	8. Decibel	13. Echo	18. Pitch
4. Sound Quality	9. Infrasonic	14. Resonance	19. Medium
5. Middle Ear	10. Inner Ear	15. Noise Pollution	20. Interference

Facts About Sound

1. The most loudest natural sound on Earth was caused by an erupting volcano. The sound produced was heard 5000 km away.

2. There is **no sound in space** because there are no particles for propagation of sound.

3. Most flies are not able to hear any sound at all, but they can detect sounds through their antennae.

4. Our ears have defence mechanism which protect us from damaging eardrums.

5. Dogs can hear sound in range of **40 Hz to 60,000 Hz**.

6. Sound can levitate objects on Earth.

7. Most sound has been weaponized to disorient or anger opponents. In Vietnam, U.S. forces turned sound into psychological warfare.

8. 150 decibels is usually considered enough to **burst your eardrums**, but the threshold for death is usually pegged at around 185-200 dB.

9. The cry of a human baby, which is about 115 decibels is louder than a car horn.

10. The loudest sustained sound can possibly be on Earth's surface is 194 dB.

Let's find out !!!

Air
N_2 and O_2 are major constituents of air

Earth's Crust
Oxygen is the most abundant non-metal in the Earth's crust

Ocean
H_2 and O_2 in the form of water and chloride ions are major constituents of the oceans

In their combined forms, non-metals form a major part of vitamins, proteins, fats, carbohydrates and enzymes.

◉ Why do copper vessels turn green ?

Copper articles, lose their shine and become green due to corrosion. Copper on prolonged exposure to moist air reacts with CO_2, H_2O and O_2 to form basic copper carbonate ($CuCO_3.Cu(OH)_2$) which is green in color.

DID YOU KNOW?

The Statue of Liberty is made up of copper. Due to corrosion, it has turned green

Conservation of Plants and Animals

What are "hotspots"?

The hotspots are the richest and the most threatened reservoirs of plant and animal life on Earth.

If all the biodiversity hotspots put together, they cover less than 2 per cent of the earth's land area, the number of species they collectively harbour is extremely high and strict protection of these hotspots could reduce the ongoing mass extinctions by almost 30 per cent.

India has three hotspots :- **(i) Western Ghats (ii) Indo-Burma in tropical Asia** and **(iii) Himalayas**, and these extend into the neighbouring countries also.
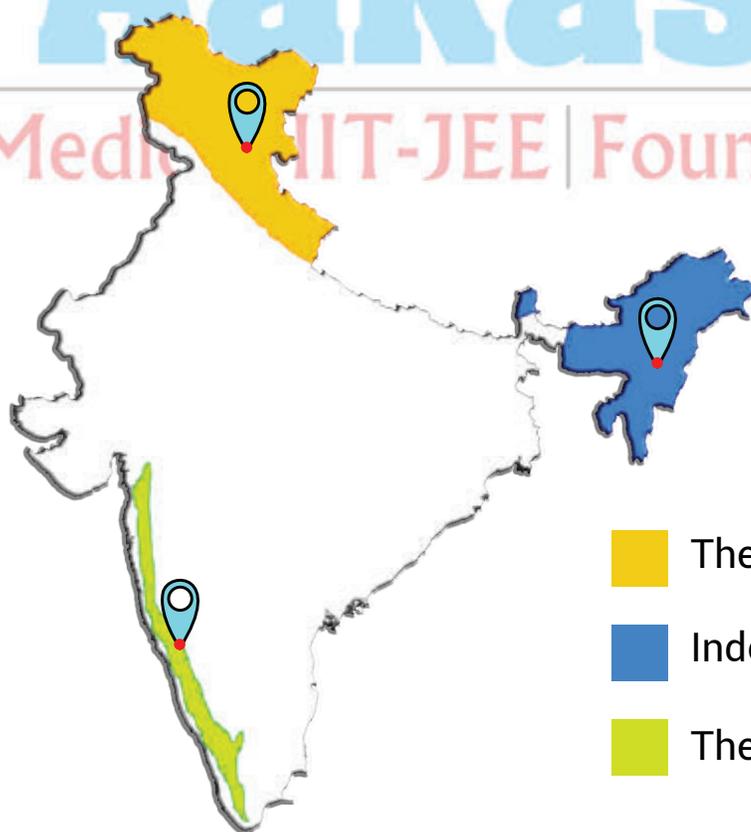
The Himalayas

Indo-Burma Region

The Western Ghats

The effect of reduction in biodiversity has been explained by **Paul Ehrlich** through **Rivet popper hypothesis**.

In an "airplane (ecosystem)", all parts are joined together using thousands of rivets (species). If every passenger travelling in it starts popping a rivet to take home (causing a species to become extinct), it may not affect flight safety (proper functioning of ecosystem) initially, but as more and more rivets are removed, the plane becomes dangerously weak over a period of time. Furthermore, which rivet is removed may also be critical. Loss of rivets on the wings (key species that drive major ecosystem functions) is obviously a more serious threat to flight safety than loss of few rivets on the seats or windows inside the plane.

Airplane	Ecosystem
Rivets	Species
Rivets on the wings	Key Species

Rivets
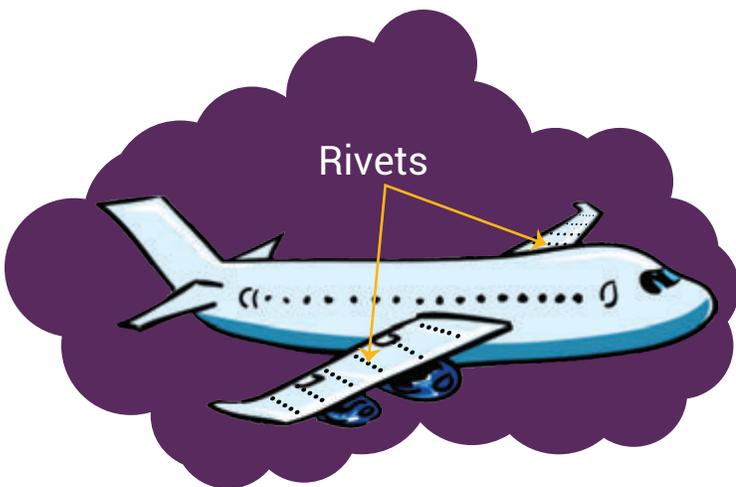
Fact 3

◆ More than 70 percent of named species are animals of which 70% are insects.

◆ Trees convert carbon dioxide into oxygen. More than 20% of the world's breathable oxygen is produced in the **Amazon rainforest** alone. Hence, it is called as "Lungs of the Planet".

◆ **Result of Biodiversity loss**

The four major causes also called **"Evil quartet"** responsible for the loss of biodiversity are :

(i)   Loss of habitat of wild animals

(ii) Over exploitation of natural resources by humans

(iii) Invasion of foreign species to a particular area

(iv) Co-extinction

◆ Find The Match

Day	Date
(a) World Forestry Day	(i) October 4
(b) World Animal Day	(ii) June 5
(c) World Habitat Day	(iii) March 21
(d) World Environment Day	(iv) First Monday of October

◆ Answer

(a) ⟶ (iii)

(b) ⟶ (i)

(c) ⟶ (iv)

(d) ⟶ (ii)

Resources

Crossword
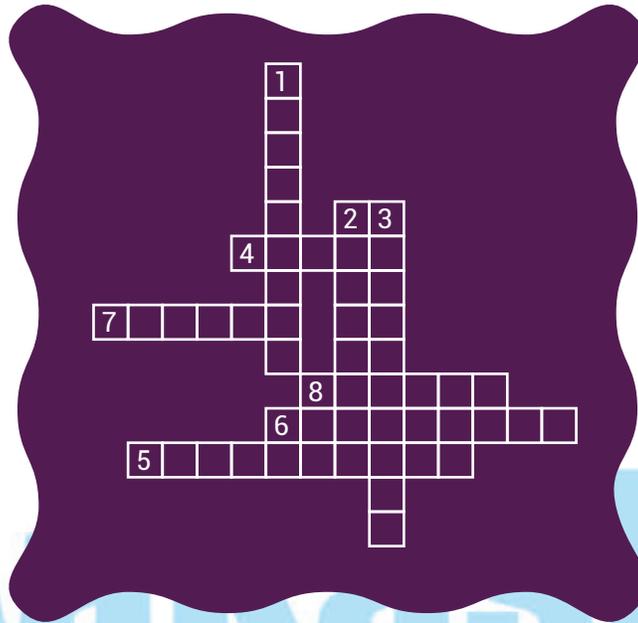
Down

1. Resources which get replenished fast are called ____
2. The number and abilities of the people are called as ____ resources.
3. Time and ____ can change any substance into resource.

Across

4. Worth of a substance is ____
5. ____ are found everywhere
6. These fill up again ____
7. ____ are being utilized at present
8. Living organism ____

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Interesting Facts

1. Iceland and Norway are the two countries in the world which produces 100% electricity through Renewable resources.

2. People in rich countries consume up to 10 times more natural resources than those in the poorest countries.

3. Costa Rica is a world leader in renewable energy.

4. Switching to wind, water and solar worldwide could eliminate 4 to 7 million deaths from air pollution every year.

5. NASA has been developing space technology that could give the world's population affordable green energy from an unlikely source – the moon.

6. Hydroelectric energy is not a natural resource because people use turbines to convert the energy from moving water.

7. The use of Coal is the cause of 40% of the carbon dioxide emissions from fossil fuels

Quiz

Q.1 Identify the resource on the basis of ORIGIN

(1) Individual

(2) Abiotic

(3) Actual

(4) Renewable

Q.2 Identify the resources on the basis of level of development

(1) Community

(2) Actual

(3) Abiotic

(4) Localized

Q.3 Resources being used for production have

(1) Legal value

(2) Economic value

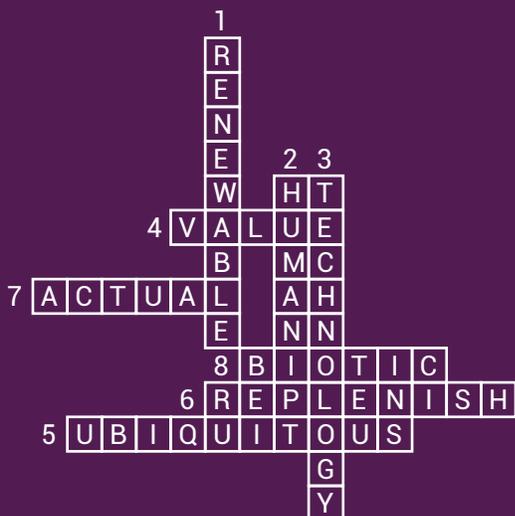(3) Aesthetic value

(4) Ethical value

Q.4 Which one of the following does not make a substance a resource?

(1) Quantity

(2) Utility

(3) Value

(4) Quality

Q.5 Which is a non-renewable resource ?

(1) Solar Energy

(2) Water Energy

(3) Coal

(4) Wind Energy

Answer (Crossword)

Answer (Quiz)

A.1	(2)
A.2	(2)
A.3	(2)
A.4	(1)
A.5	(3)

Noun Clauses

A. Identify the Noun Clause in the following sentences.

1. She has to tell me why she did not go there.
2. Can you tell me if the banks are open today?
3. What she does is unknown to all of us.
4. I don't know what they do for a living.
5. I hope that it would be true.

B. Fill in the blanks with a suitable Noun Clause based on the clue given in the bracket.

1. I really don't know _____ . (the place of my birth)
2. We didn't notice _____ . (the flowers in his hands)
3. Our parents wish _____ this time at the exhibition. (we win a prize)

Answers-A

1. She has to tell me why she did not go there.
2. Can you tell me if the banks are open today?
3. What she does is unknown to all of us.
4. I don't know what they do for a living.
5. I hope that it would be true.

Answers-B

1. where I was born
2. that there were flowers in his hands
3. that we would win a prize

Number Riddles

Pick a number between 1 and 10.

Add 8.

Add 5.

Subtract the original number you picked

The answer is

?

Mnemonic

Order of Operations in Mathematics

P **E** **M D** **A S**

Parentheses, Brackets and Groupings

Exponents

3^2

Multiplication/ Division

Addition/ Subtraction

( ) [ ] × ÷ + −

If you multiply this number by any other number the answer will always be the same as the given number. What number is this ?

Crack the Code

CODE

A numeric lock has a 3 digits key

HINTS

3 8 2
One number is correct and well placed

4 7 6
One number is correct but wrong placed

8 0 6
One number is correct but wrong placed

7 3 8
Nothing is correct

7 8 0
One number is correct but wrong placed

(a) 0 6 2

(b) 6 0 2

(c) 0 4 2

(d) 2 0 4

19

Answer (Crack the Code)

Pick a number between 1 and 10.

Add 8.

Add 5.

Subtract the original number you picked

The answer is

13

Answer (Quiz)

ZERO

Answer (Crack the Code)

(c) 0 4 2

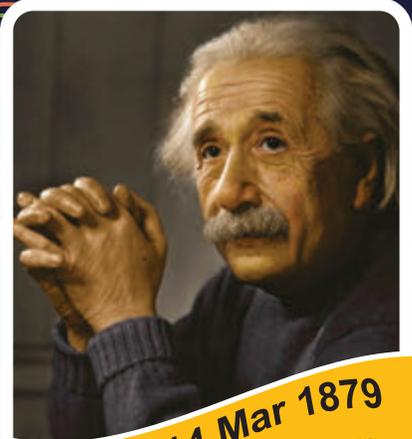**Explanation:** From all the hints given, only 042 satisfies and it unlocks the lock.

Happy Birthday

Albert Einstein

Born - 14 Mar 1879
Died - 18 Apr 1955

Law of Photoelectric Effect

Developed the world's most famous equation $E = mc^2$ and the General Theory of Relativity - one of the two pillars of modern physics.

In 1921, he was awarded the Nobel Prize in Physics "for his services to theoretical physics and especially for his discovery of the law of Photoelectric Effect". The latter was pivotal in establishing quantum theory.

OUR RESULTS 2024

NEET (UG) 2024

AIR 1

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

JEE (Advanced) 2024

AIR 25	AIR 67	AIR 78	AIR 93	AIR 95
Rishi Shekher Shukla 2 Year Classroom	**Krishna Sai Shishir** 4 Year Classroom	**Abhishek Jain** 4 Year Classroom	**Hardik Aggarwal** 2 Year Classroom	**Ujjwal Singh** 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	Class VIII	Class VIII	Class VIII	Class VIII	Class IX
Joish Achyuta 2 Year Classroom	**Pranava NS** 3 Year Classroom	**Bruteshwar Rajguru** 3 Year Classroom	**Hardik Mishra** 2 Year Classroom	**Hardik Dhariwal** 2 Year Classroom	**Dhanush Damu** 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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