Aakash

Medical | IIT-JEE | Foundations

KNOWLEDGE BYTES

APRIL 2025

CLASS 9

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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

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EXPLORE

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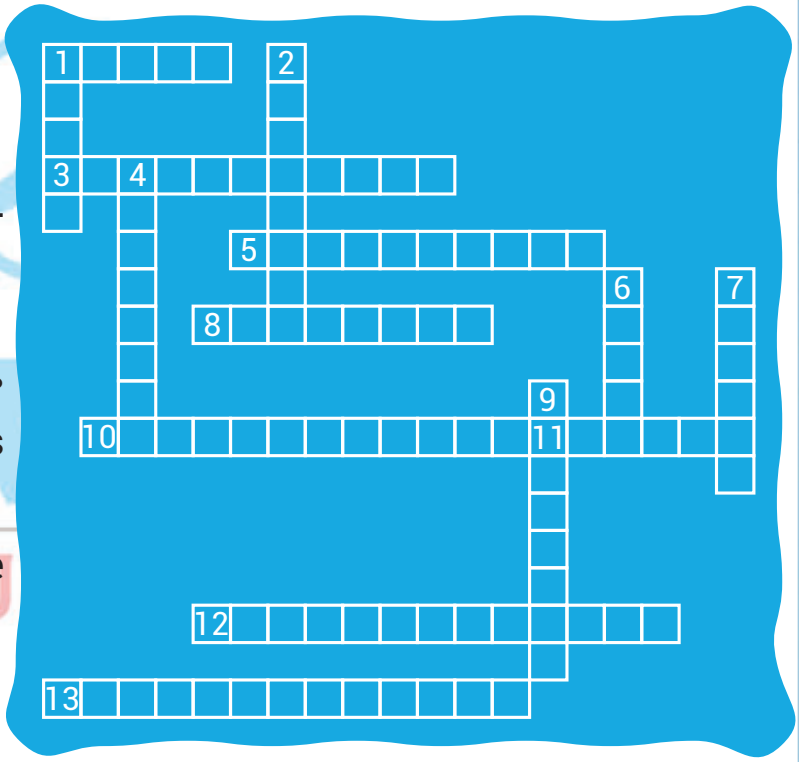
Crossword — Lines and Angles

Across

1. Figure formed by two rays having same end point.
3. A line intersecting two other lines.
5. Two adjacent angles formed on a straight line.
8. Two lines that do not intersect or meet are known as _____ lines.
10. The arms of a straight angle form a _____.
11. Angle measuring less than 180° and more than 90° is known as _____ angle.
12. Two angles whose sum is 90° are called _____ angles.
13. Two angles whose sum is 180° are called _____ angles.



Down

1. Angle measuring less than 90° and more than 0° is known as _____ angle.
2. Angle whose measure is equal to the sum of two interior opposite angles of a triangle is known as _____ angle.
4. Two angles having a common ray and a common vertex are called _____ angles.
6. Angle measuring 90° is known as _____ angle.
7. Angle measuring less than 360° and more than 180° is known as _____ angle.
9. Angle measuring 360° is known as _____ angle.

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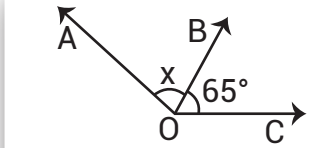
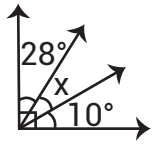
Trace out the path from start to end. Each path can be crossed only if value of x is correct.

START

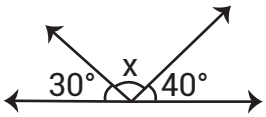


$\angle AOC = 147°$

82°



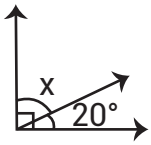
52°



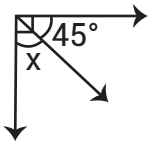
80°

51°

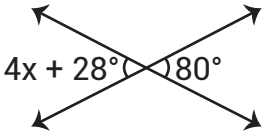
110°



45°



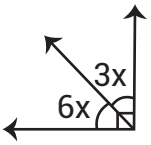
12°



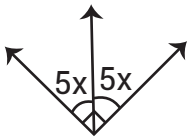
70°

9°

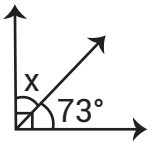
13°



10°



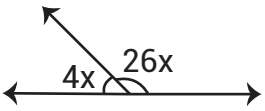
16°



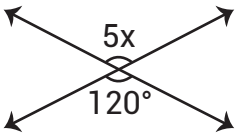
90°

20°

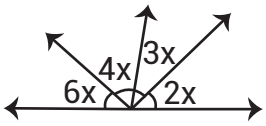
17°



24°



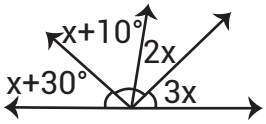
12°



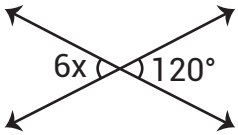
6°

18°

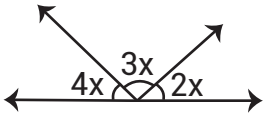
14°



18°



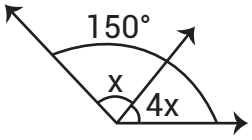
16°



20°

9°

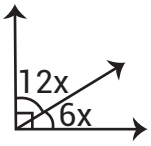
20°



30°

END

5°



ACTIVITY

Six places to visit

Well, we're going to look at visiting places.

Here's the road map :

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There are six places to visit :

1. Relatives who live in the tall house with blue door
2. Friends who live in the house with trees
3. The wide school building
4. The blue church
5. The healthcare centre with blue roof and pink walls
6. The little pink shop

You live in the yellow house at the bottom of the map.

Starting at your house, try to describe the journey to each of the six places. You'll need to describe the bends in the road [how much they turn] and which way to turn at junctions.

Riddles

Write one meaningful word using letters from the following riddles.

1. I am a letter with a set of three horizontal and parallel lines.

I also have a vertical line segment to the left of the parallel lines.

2. I am a letter with an acute angle.

I also have a horizontal line segment.

3. I am a letter with two vertical parallel line.

I also have a horizontal line segment in between the parallel lines.

4. I am a letter with three line segments and two of them are parallel.

I also have two acute angles.

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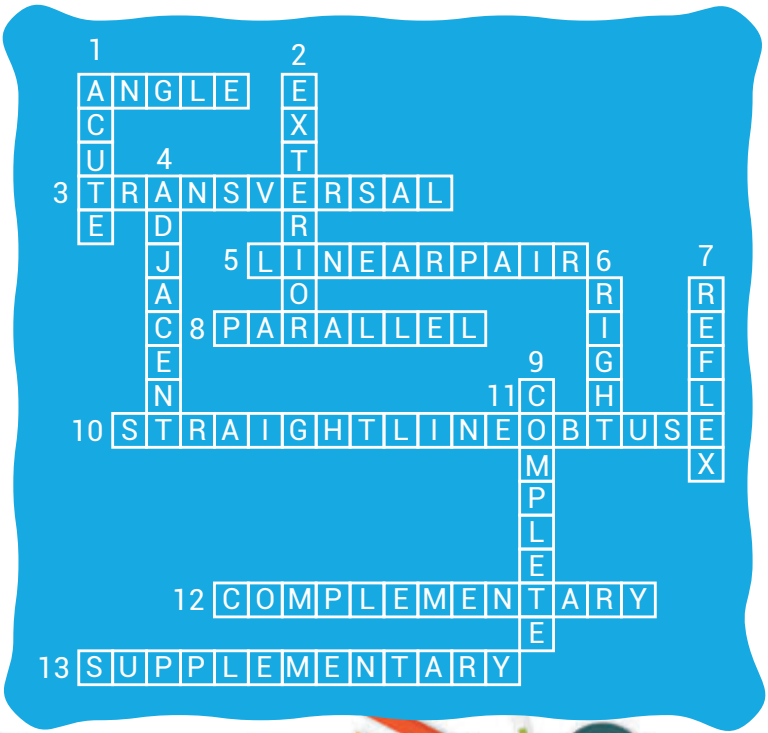
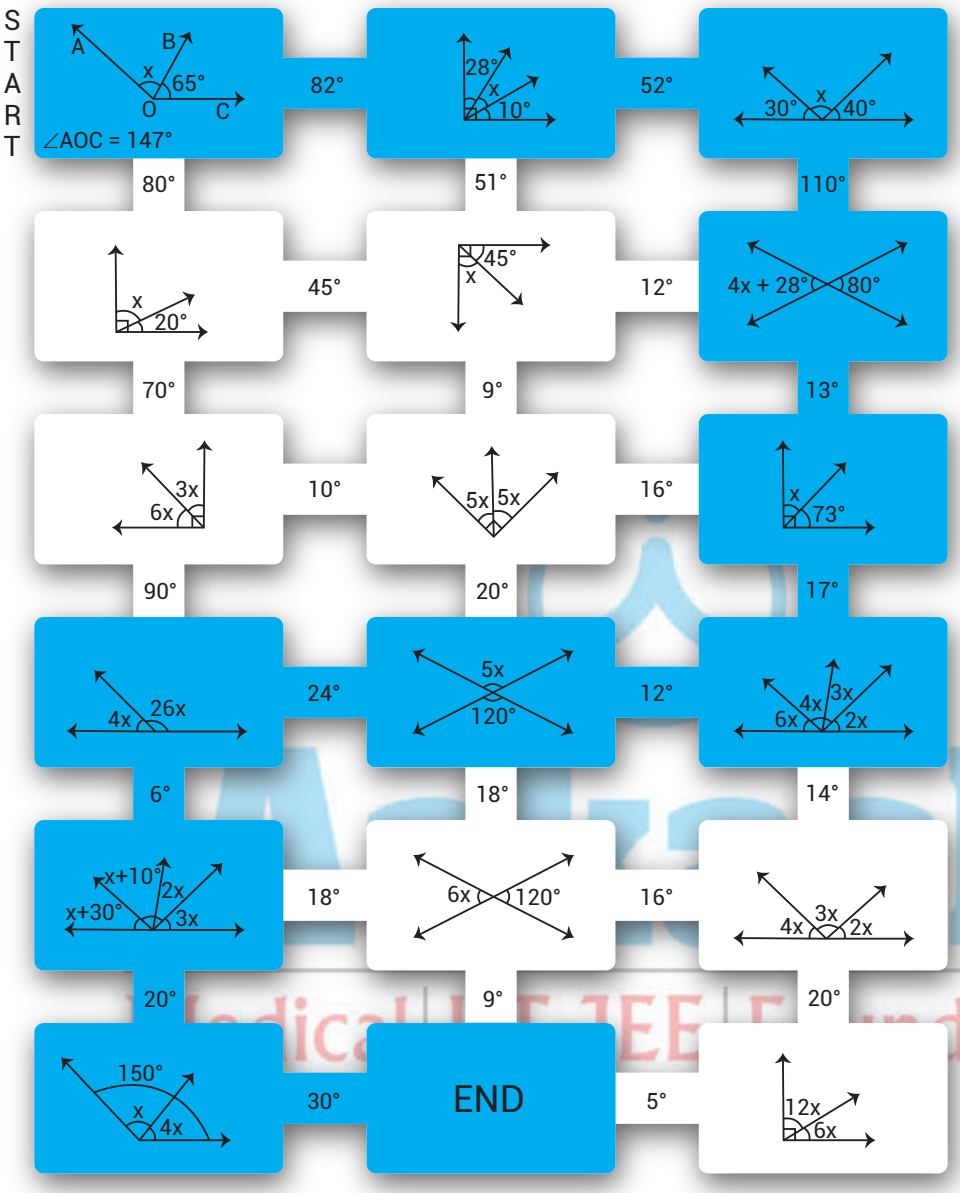
Answer (Crossword)





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Answer (Riddles)

1. E
2. A
3. H
4. Z

So, the meaningful word is HAZE.

Crossword Gravitation

Across

3. Value of 'g' at centre of the earth
4. Law of Gravitation was given by
5. Gravitational force depends upon
6. Force by which all bodies having mass attract each other
7. Force of attraction by the earth
8. Gravitational force does not depend upon
9. Value of 'g' _____ with increase in depth

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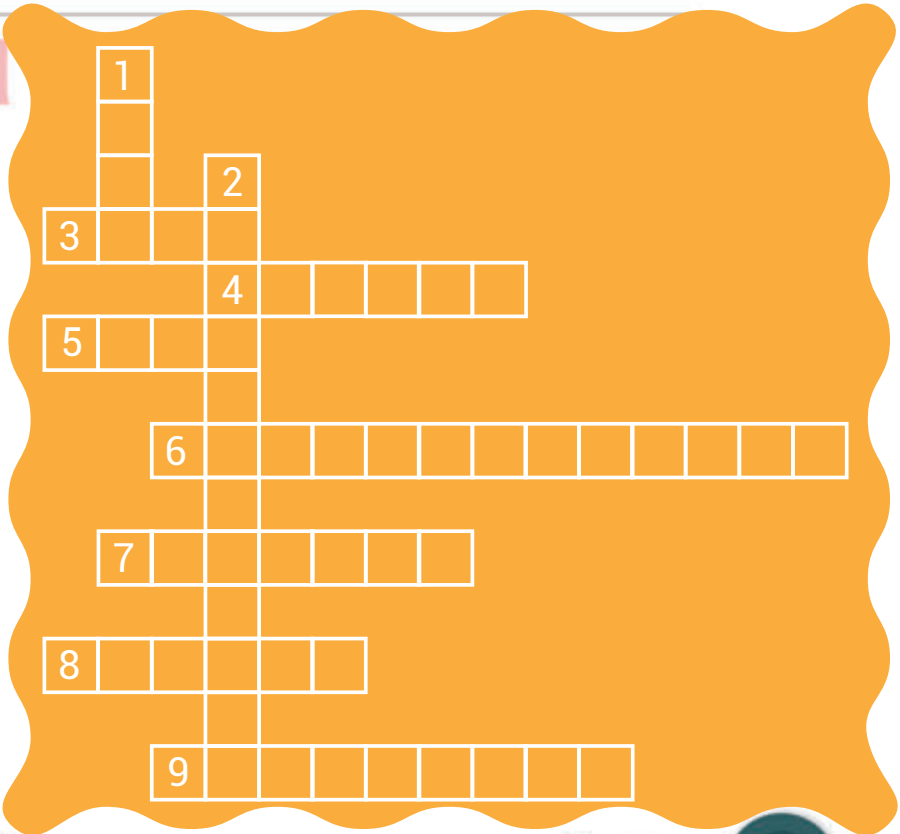
Down

1. 'g' is maximum at _____ of the earth.
2. Gravitational force is a _____ force.



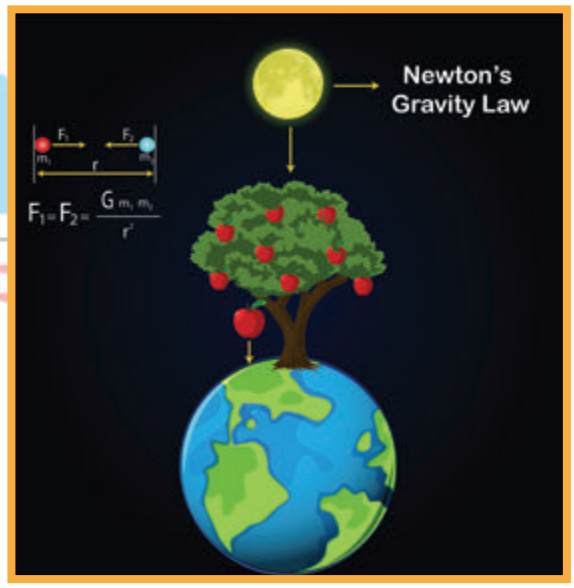
Gravitation Facts

1. Newton was not hit by apple - he simply observed an apple falling from a tree.

2. Gravity word originated from the Latin word gravis (heavy).

3. Fishes have calcium deposits or stones in their heads that tells them which way is up through feeling gravitational pull.

4. Gravitational force makes ocean bulge.



5. The higher something is, the greater its gravitational potential energy.

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6. Archimedes first discovered centre of gravity of a triangle.

7. Larger masses are subjected to greater gravity.

8. Our weight at poles will be more than that of equator.

9. We feel weightlessness at the centre of earth.

10. If we throw something with speed more than 11.2 km/s, then it will never come back.

Interesting Facts About Gravitation

1. **Gravity is not a force**

   Accordingly to Einstein, the fabric of space - time is bent by massive objects, distorting the paths of other objects.

2. The range of gravity is infinite.

3. The lack of gravity in space makes astronauts grow by 2 inches. However, once they came back the Earth's gravity will compress their ligaments and undo this growth.

4. **Gravity stops mountains from getting too high**

   The taller a mountain is the greater the pressure it exerts on its base. So the base is so squished it starts to turn into a fluid.

5. Gravity can bend light.

6. In space astronauts don't have the urge to pee until their bladder is basically exploding.

7. Birds cannot be taken into space because they require gravity to swallow.

8. Jupiter is sometime referred as failed star because it has enough mass to pull significant amount of gases but it is not enough to start fusion.

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Scientists Info and Contribution

Isaac Newton

In the 17th century, Newton concluded that objects fall because they are pulled by earth's gravity. Einstein's interpretation was that these objects do not fall. According to Einstein, these objects and earth just freely move in a curved spacetime and this curvature is induced by mass and energy of these objects.

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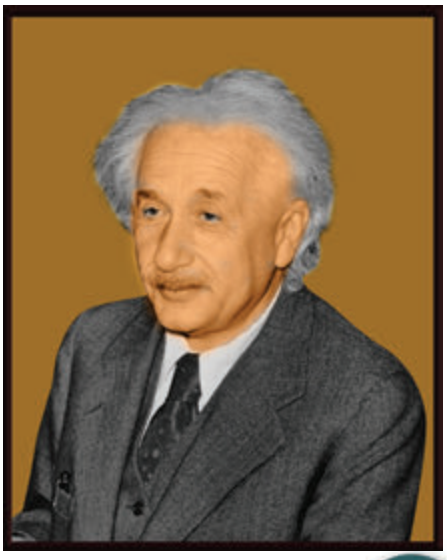
Albert Einstein

Einstein deduced that there is no fixed frame of reference in the universe. Everything is moving relative to everything else, it's Einstein's theory of relativity.



It is known as special theory of relativity because it applies only to special cases : frame of reference is constant, unchanging motion.

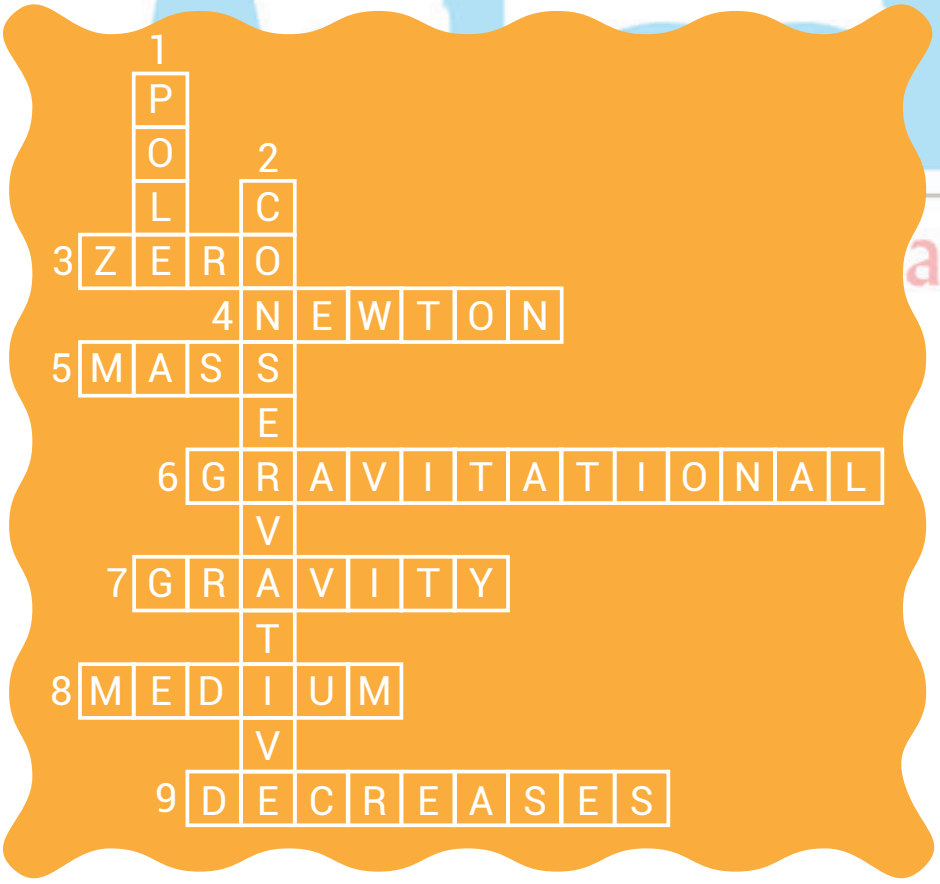
In 1915, Einstein published the general theory of relativity, which applies to frames that are accelerating with regard to each other.

Myth-Buster

Time is same for everyone

Time does not passes at same rate for everyone. A fast moving observer finds time passing more slowly than a (relatively) stationary observer would. This phenomenon is called **time dilation**.

Answer (Crossword)



Scientists Info and Contribution

Amedeo Avogadro (1776 – 1856)

- The first scientist to realize that elements could exist in the form of molecules rather than as individual atoms.
- Proposed Avogadro's law.

Robert Boyle (1627 – 1691)

- Transformed chemistry from a field bogged down in alchemy and mysticism into one based on measurement.
- He defined elements, compounds and mixtures.
- He discovered the first gas law – Boyle's Law.

Hennig Brand (1630 – 1710)

- Discovered phosphorus and became the first person in history to discover a chemical element.

Marie Curie (1867 – 1934)

- Codiscovered the chemical elements radium and polonium.
- Made numerous pioneering contributions to the study of radioactive elements.
- Carried out the first research into the treatment of tumors with radiation.

Antoine Lavoisier (1743 – 1794)

- Father of modern chemistry.
- Discovered the role of oxygen in combustion and respiration.
- Established that water is a compound of hydrogen and oxygen.
- Proved that diamond and charcoal are different forms of the same element, which he named carbon.

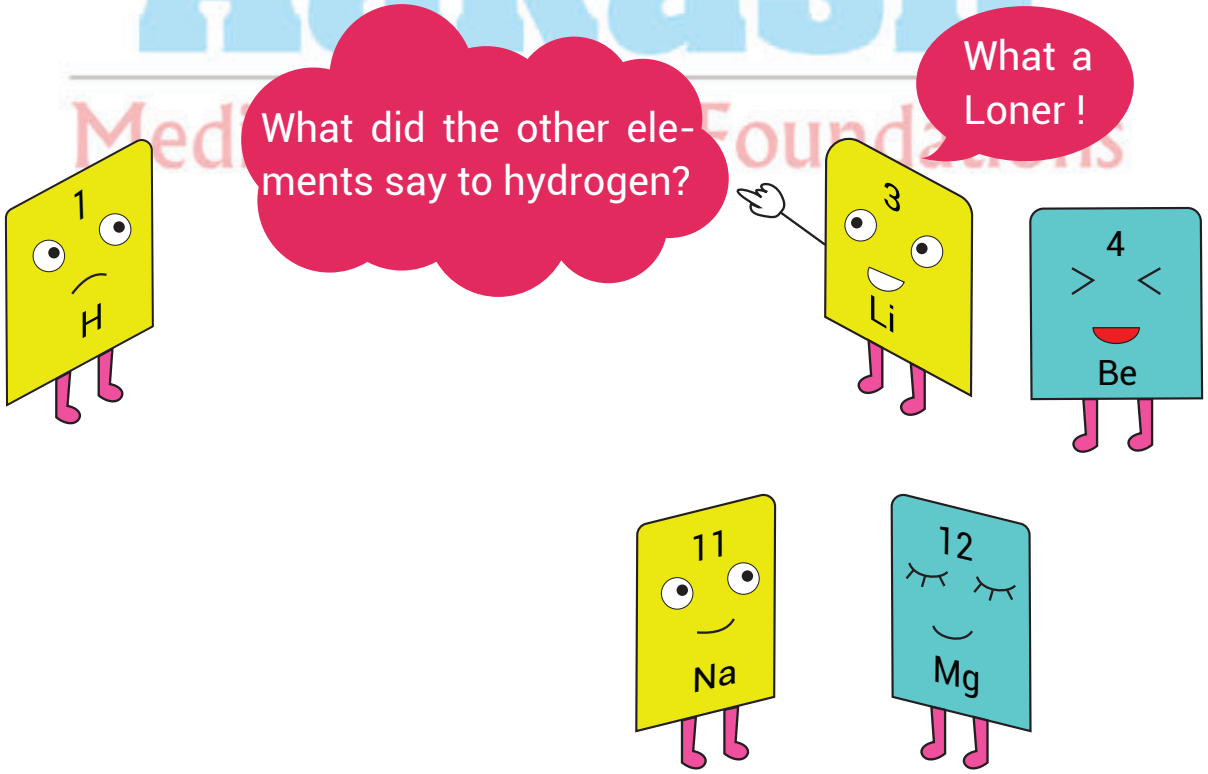
Confusing Element Symbols

Na SODIUM – NATRIUM
Arabic – natrun

Latin name of sodium is 'natrium', which derives from the Greek 'nitron' (a name for sodium carbonate). Its original source is likely to be the Arabic word 'natrun'. A number of modern languages still call the element natrium instead of sodium.

K POTASSIUM - KALIUM
Arabic – al qaliy

'Kalium' is the Latin name of potassium which derives from the Arabic 'al qaliy', meaning "calcined ashes" (the ashes left over when plant material is burned). As like sodium, a number of modern languages still refer to potassium as kalium.



Quiz

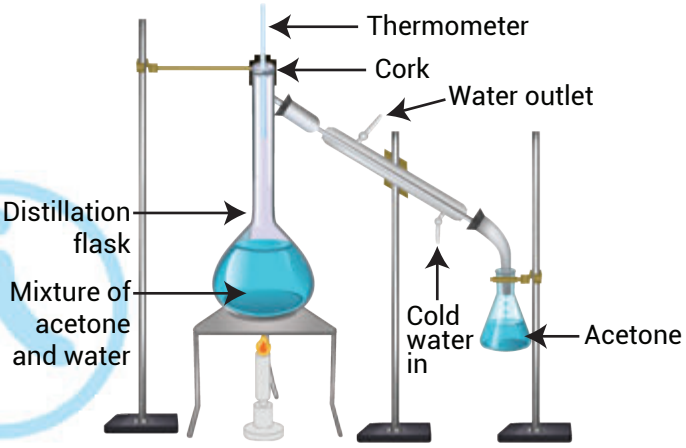
Q.1 What is the function of water condenser in the given experimental set-up?

(1) To apply pressure to the mixture in distillation flask

(2) To allow only lower boiling component to escape

(3) To cool and condense the vapours

(4) To allow the water from the mixture to move out



Q.2 Which of the following colloidal systems correctly represent points 1, 2 and 3?

(1)

1	2	3
Mist	Whipped cream	Dust fumes

(2)

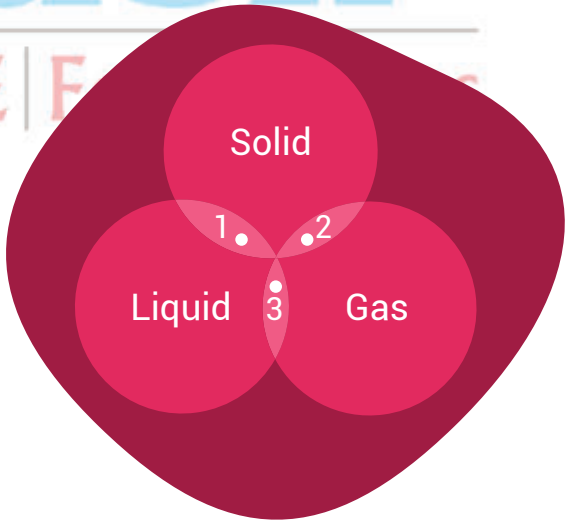
1	2	3
Milk	Hair cream	Pumice stone

(3)

1	2	3
Paints	Smoke	Cloud

(4)

1	2	3
Coloured glasses	Whipped cream	Butter



Q.3 What kind of solution is amalgam?

(1) Solid in solid

(2) Solid in mercury

(3) Liquid in gas

(4) Liquid in magnesium

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Q.4 Study the given flow chart and choose the correct statements.

(i) The property used here to separate the components of a mixture is solubility of different components in different solvents.

(ii) Sulphur is soluble in carbon disulphide, salt in water and coal is insoluble in both.

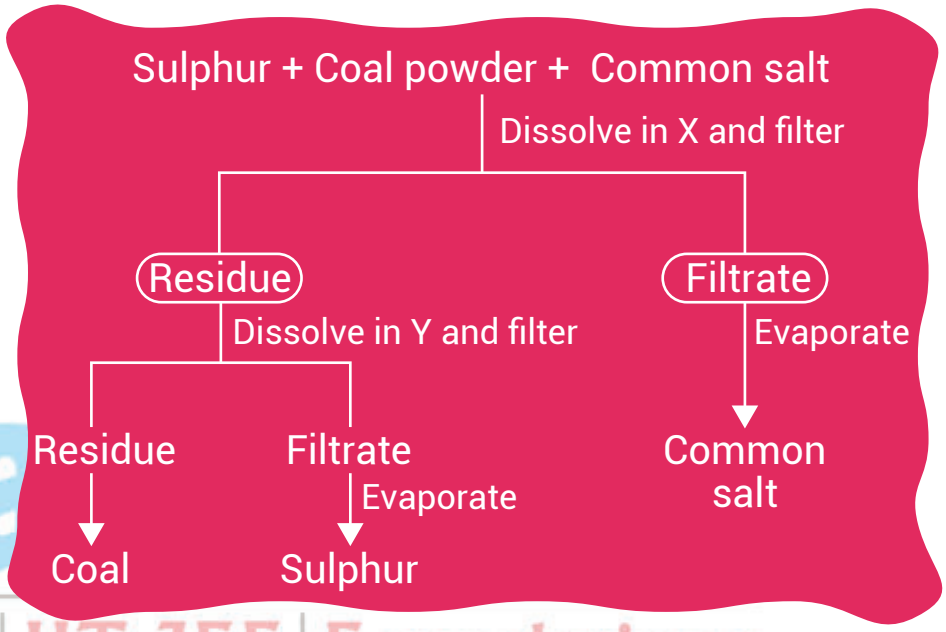
(iii) X is water and Y is carbon disulphide.

(1) Only (i) and (ii)

(2) Only (ii) and (iii)

(3) Only (i) and (iii)

(4) All are correct



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Q.5 How is Brownian motion caused?

(1) Due to temperature fluctuations within the liquid phase

(2) Due to attraction and repulsion between the charges on the colloidal particles

(3) Due to collision of molecules between the colloidal particles

(4) Due to pressure variations within the liquid phase

(Answer) Quiz

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

Crossword

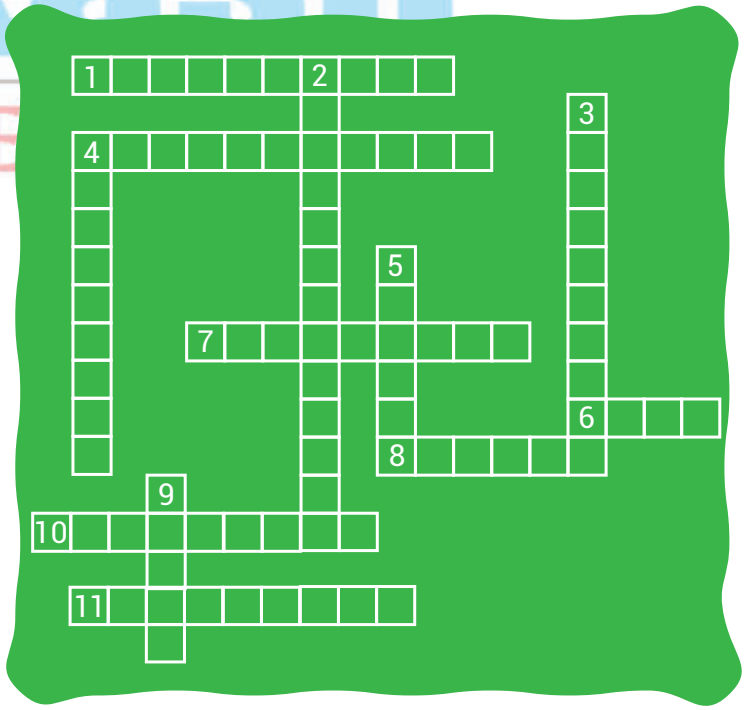
Diversity in Living Organisms

Across

1. Worm causing elephantiasis is _____.
4. Mode of nutrition in fungi.
6. An example of thallophytes.
7. Wings of birds are modified form of _____.
8. Name of annelid which is commonly called sandworm.
10. Type of symmetry in arthropods.
11. Body cavity of arthropods.

Down

2. Phylum of spiny skinned sea animals.
3. Scientific name of cow.
4. It is a fresh water sponge.
5. Cell wall of fungi is made up of _____.
9. Seeds of gymnosperms are _____.



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Interesting Fact

You know, a poriferan we study about in books now was once used as a wedding gift?

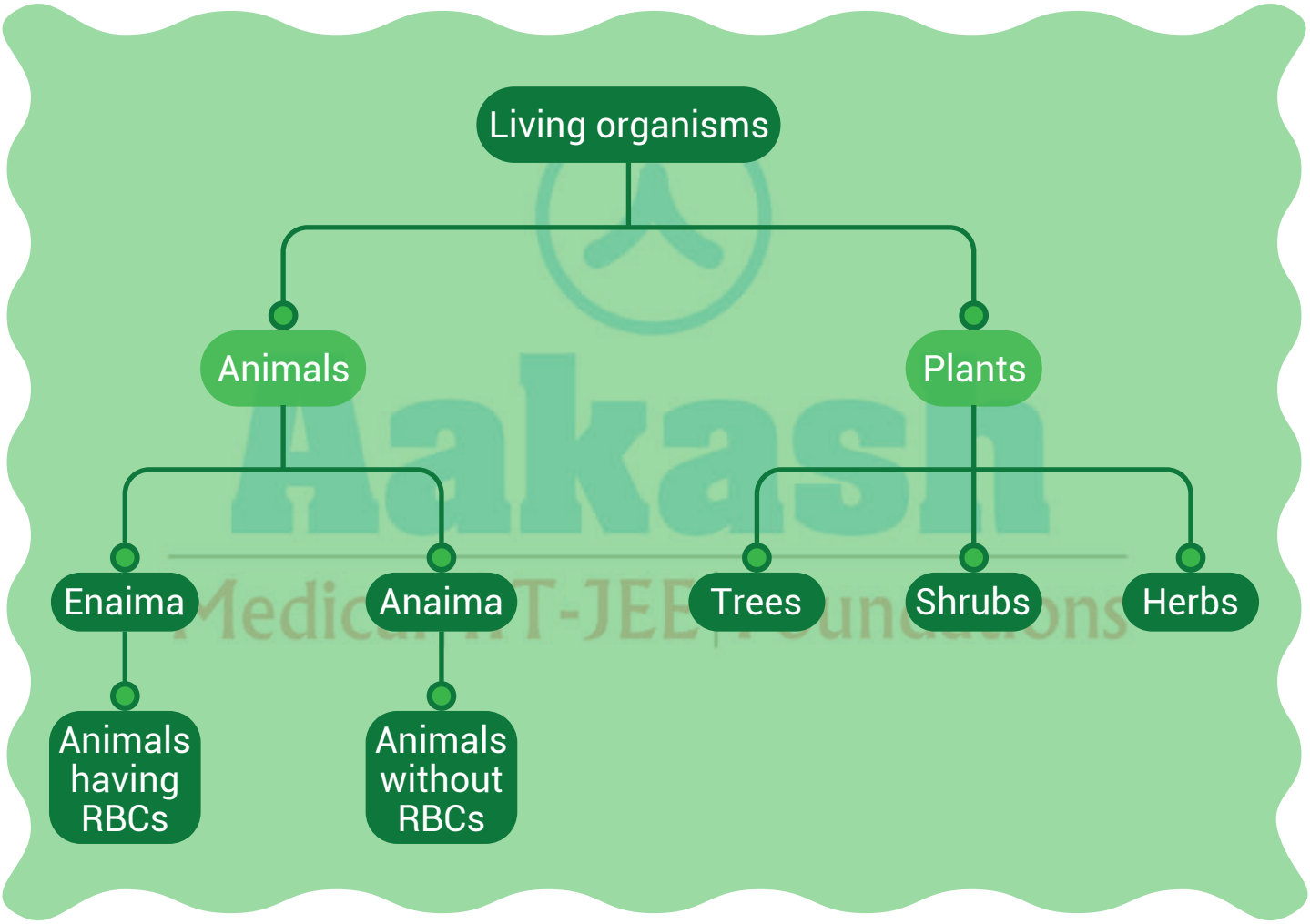
Check it out..

In traditional Asian cultures *Euplectella* (Venus Flower Basket) was given as a wedding gift (in its dead, dry state) because the sponge symbiotically houses two small shrimps, a male and a female, who live out their lives inside the sponge. In Japan, they symbolise the idea of "till death do us part".

When the shrimp's offsprings are tiny, they escape to find a Venus Flower Basket of their own. Once moved in, the shrimp cleans the basket and, in return, the basket provides food for the shrimp by trapping it in its tissues.

Scientific Contribution

First scientific attempt for classification was performed by **Aristotle** in following manner :-



Aristotle used simple morphological characters to classify plants into herbs, shrubs and trees. He classified animals into Anaima and Enaima, on the basis of absence or presence of RBCs respectively.

Mnemonic

1. Kids Prefer Candy Over Fried Green Spinach.

Kingdom Phylum Class Order Family Genus Species.

2.

Examples of Monocots		
C	⇨	Coconut
R	⇨	Rice
O	⇨	Onion
W	⇨	Wheat

Examples of Dicots		
Some	⇨	Sunflower
Says	⇨	Sweet potato
Ban	⇨	Banyan
APP	⇨	Apple, Pea, Potato

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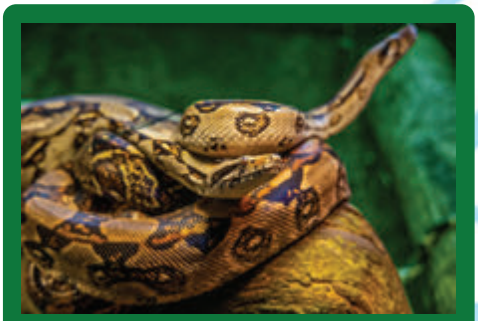
Match The Following

(a) Without any nerve cell	(i) *Musca*
(b) First triploblastic animal	(ii) *Hyalonema*
(c) First closed circulatory system	(iii) Devil fish
(d) Green gland	(iv) *Taenia solium*
(e) Hemocyanin	(v) Earthworm

Kiwi

Kiwi is the smallest living flightless bird while Humming bird (sunbird) is the smallest bird.

Humming Bird



Python

Thread snake

Largest snake - Python
Smallest snake - Thread snake

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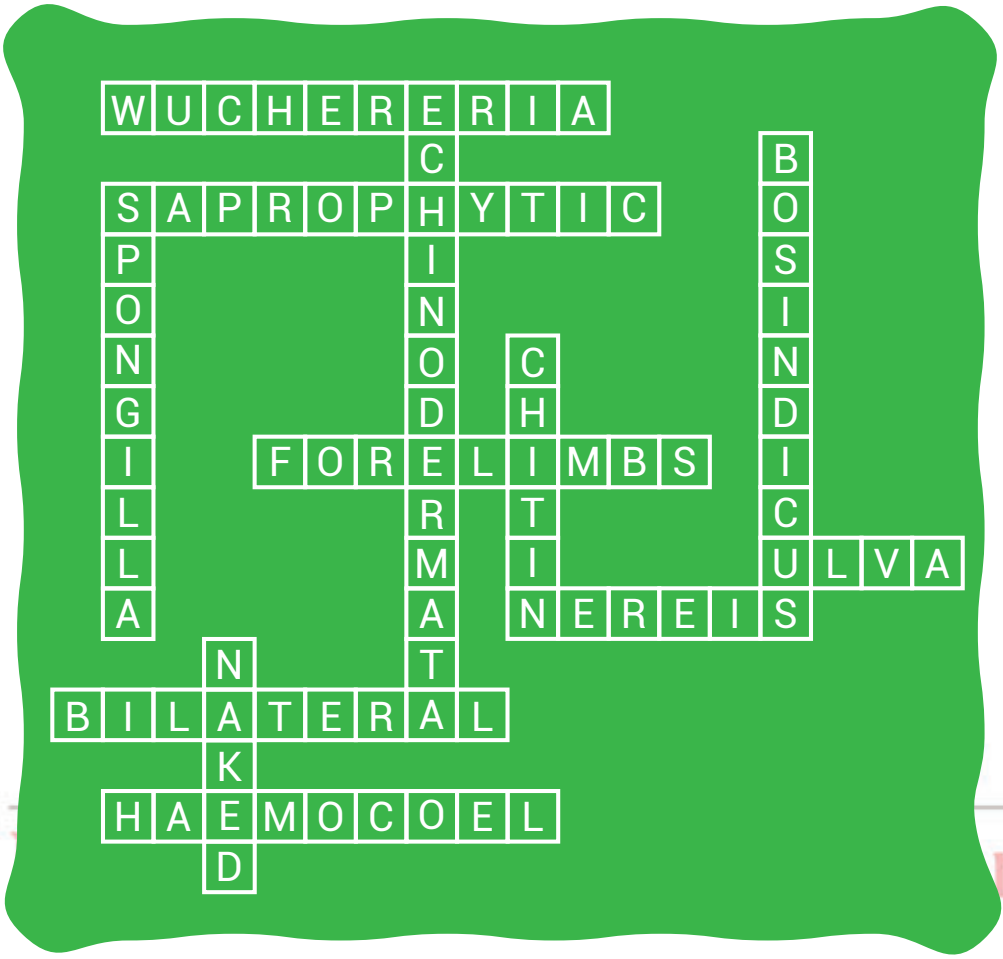
Blue Whale

Blue whale is the largest living animal.

Answer (Crossword)

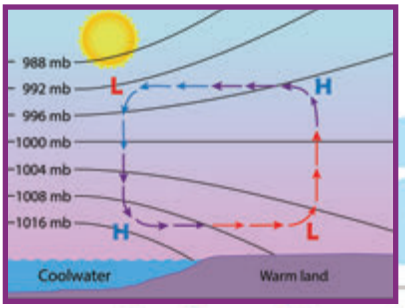


Answer (Match the following)

(a) ⇒ (ii)
(b) ⇒ (iv)
(c) ⇒ (v)
(d) ⇒ (i)
(e) ⇒ (iii)

The Advancing Monsoon or Rainy Season in India

1 Towards the end of May, an elongated low-pressure area develops in the region extending from the Thar Desert in the northwest to Patna and Chotanagpur plateau in the east and southeast.



2 This low pressure attracts the South-east trade winds of the southern hemisphere.

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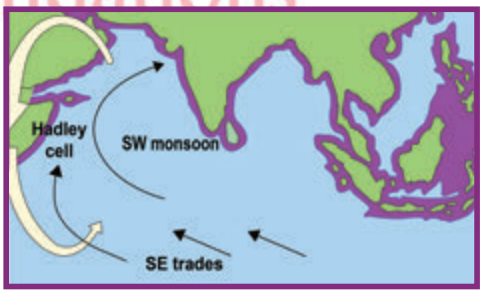
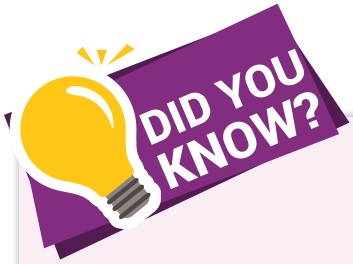
3 These South-east trade winds cross the equator and blow in a south-westerly direction and enters the Indian peninsula as the south-west monsoon.



4 As these winds blow over warm oceans, they bring abundant moisture to the Indian subcontinent.

Tenses

Tense is the form of a verb that shows the time something happens, happened, or is going to happen.



- Tense can be shown by changing the spelling of a verb. For example, *be* can become *am*, *is*, and *are* in present tense, and *was* and *were* in past tense. In English, future tense is shown by adding *will* before the verb. For example, *be* becomes *will be* in future tense.
- Latin usually shows tense by changing the verb, like English. However, Chinese and Indonesian show tense by adding new words, instead of changing the verb.
- The pluperfect (shortening of plusquamperfect), usually called past perfect in English, means more than perfect.

  e.g. "It had already been raining for a week when the big storm started."
- To speak about the future, we use 'auxiliary verbs'.

  If you say “I will write him a letter," the word “write" is the main action. The word “will" is the helping verb denoting that the action will be done in the future.
- You can use present tense to denote future time reference in certain cases.

E.g. The concert *starts* at 7 tonight.

My parents *are visiting* for Christmas next year.

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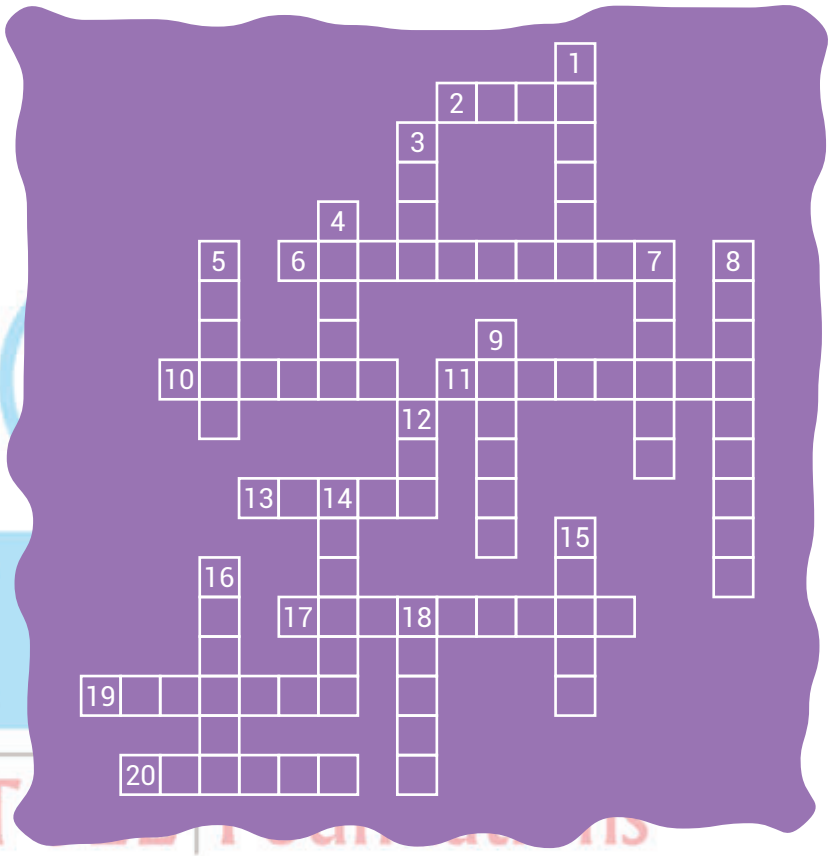
Crossword

Across

2. infinitive of torn
6. past participle of frighten
10. past participle of talk
11. present participle of laugh
13. infinitive of cleaning
17. past participle of discuss
19. present participle of look
20. simple past of dance



Down

1. past participle of braze
3. past participle of sing
4. simple past of freeze
5. infinitive of spoke
7. present participle of dare
8. past participle of forget
9. past participle of teach
12. infinitive of ran
14. present participle of eat
15. past participle of sleep
16. past participle of break
18. infinitive of caught

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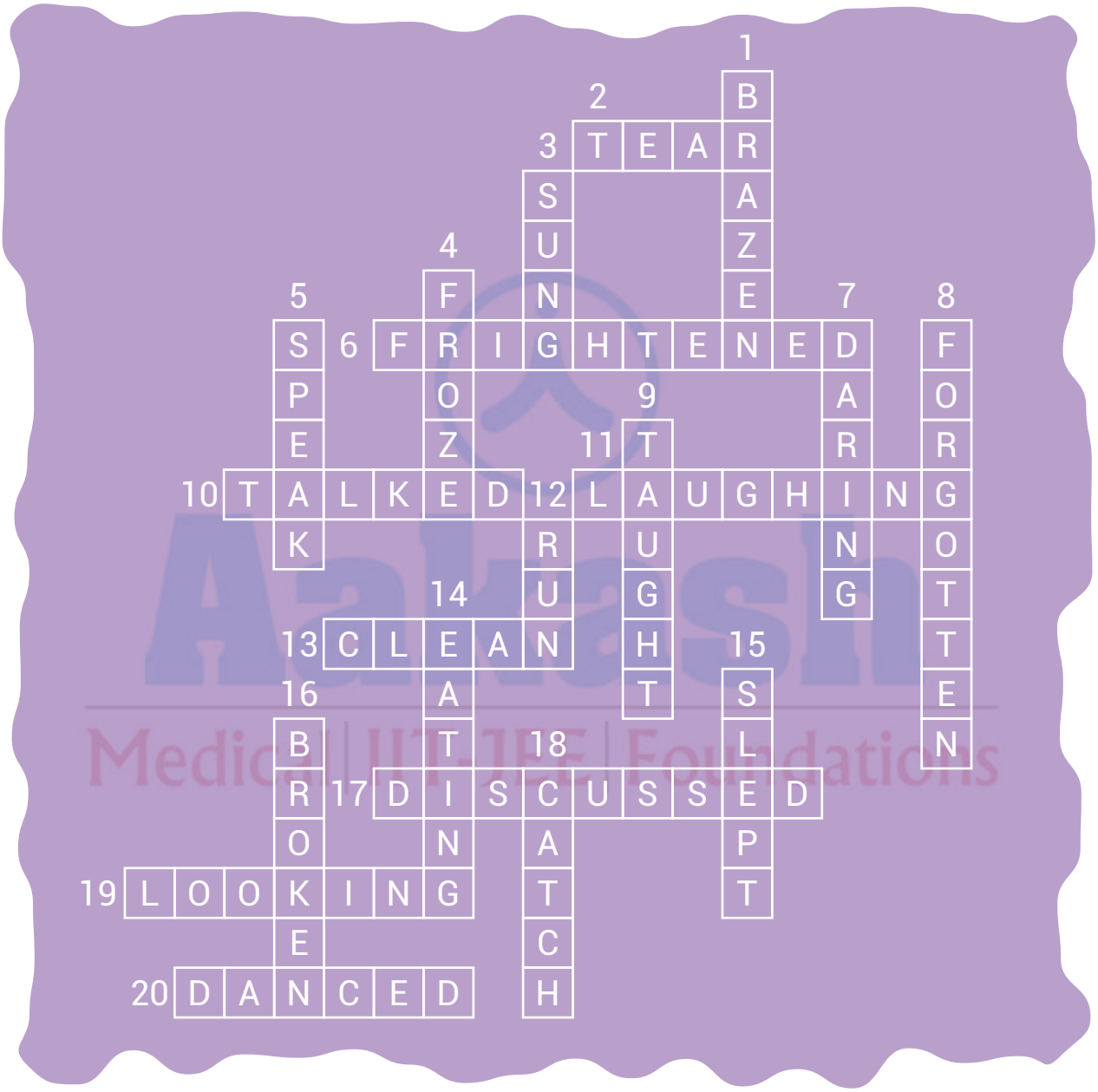
Answer (Crossword)



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Brainstormer

There are 8 members in a family namely Alpha, Beta, Gama, Delta, Theta, Pi, Sigma and Omega in which there are 2 married couples. Among the 8 members there are 2 lawyers and 2 artists. Delta is the daughter-in-law of Sigma. Pi is the brother of any of the two artists. Omega, who is the artist, is the sister of Alpha. No female is a lawyer. Delta is an artist. Gama is the husband of Sigma. Theta is the only son of Sigma. Beta is the lawyer and is the brother of Gama. Alpha is the lawyer and is the son of Theta.

Q1. If Pi is the brother of Omega, how many children does Theta has?

1. 6
2. 3
3. 5
4. 2

Q2. How many female members are there in the family?

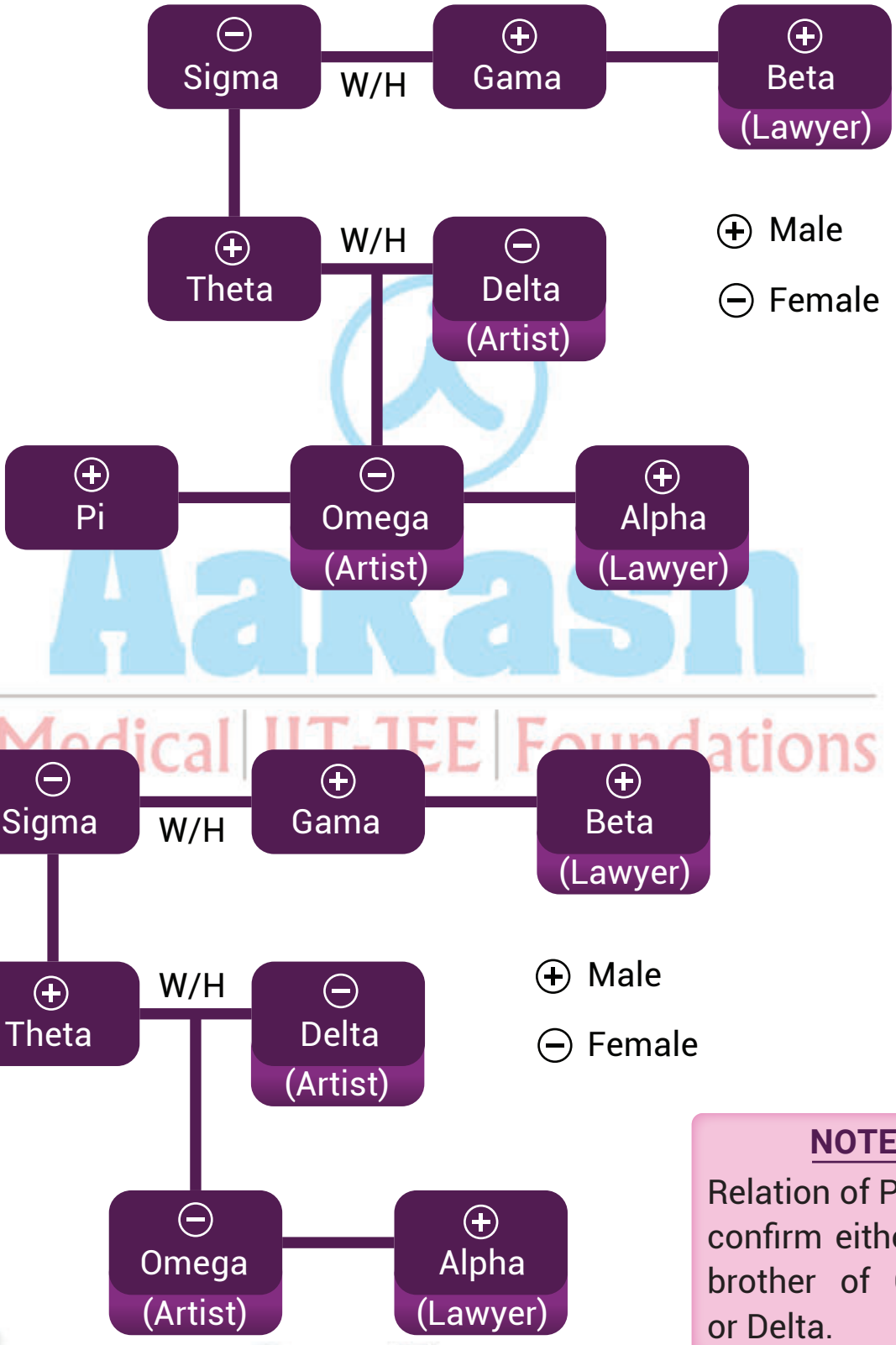
1. Three
2. Four
3. Five
4. Six

Q3. Which pair would be grandsons of Sigma?

1. Delta and Alpha
2. Omega and Theta
3. Alpha and Pi
4. Beta and Gama

Answer (Brainstormer)

1. **2**



2. **1**

3. **3**

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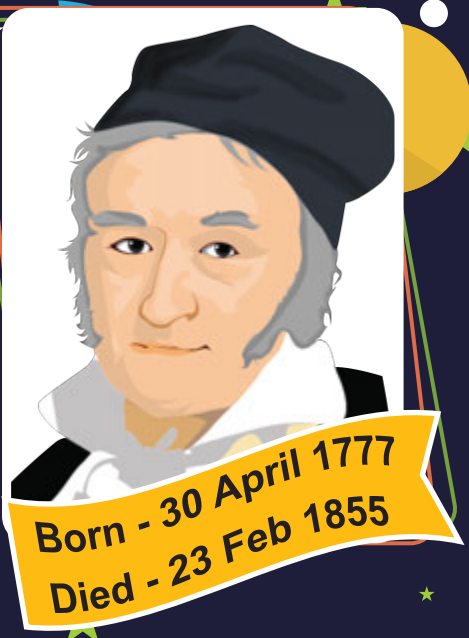
NOTE

Relation of Pi is not confirm either Pi is brother of Omega or Delta.

Happy Birthday

Carl Friedrich Gauss



Carl Friedrich Gauss, original name Johann Friedrich Carl Gauss, (born April 30, 1777, Brunswick [Germany] - died February 23, 1855, Gottingen, Hanover).

German mathematician, generally regarded as one of the greatest mathematicians of all time for his contributions to number theory, geometry, probability theory, geodesy, planetary astronomy, the theory of functions, and potential theory (including electromagnetism).

Along with Archimedes and Newton, Gauss is undoubtedly one of the three geniuses in the history of mathematics.

OUR RESULTS 2024

NEET (UG) 2024

AIR 1

JEE (Advanced) 2024

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

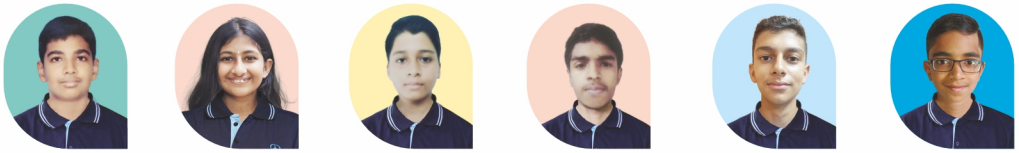
Aneesh Shastri	Sanvi Jain	Mridul M Anand	Zaman Hussain	Sushant Agarwal	Archit Kumar
Qualified INAO	Qualified INChO	Qualified INBO	Qualified INMO	Qualified INJSO	Qualified INAO Jr

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

and many more...

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

IOQM - Indian Olympiad Qualifier in Mathematics

and many more...

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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