Aakash
Medical | IIT-JEE | Foundations

KNOWLEDGE BYTES

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CLASS 8

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
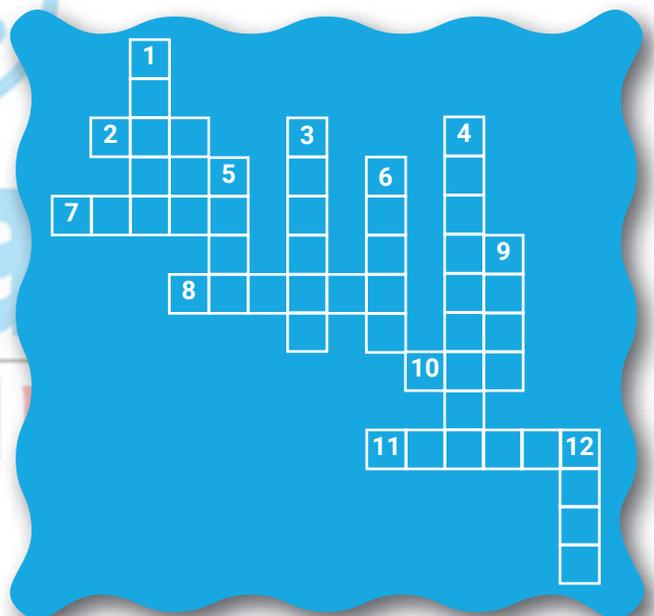
EXPLORE

Exponents and Power

Crossword

ACROSS

2. If a number is squared, that tells you to multiply the number by itself ____ times.

7. If a number is cubed, it tells you to multiply the number by itself ____ times.

8. If you see a 3^4, you would say that, "it is three to the ____ power."

10. Any number raised to the zero power is ____

11. We multiply ____ to the base as many times as the exponent says

DOWN

1. Five cubed could also be written as five to the third _____.

3. The another term for second power is _____

4. Even though they have special names, squares and cubes are still _____.

5. Zero raised to any power (except 0) is _____

6. Three to the eighth power would be 3 × 3 × 3..... upto n times, where n is_____

9. The another term for third power is _____

12. The exponent of 4 × 4 × 4 ×4 × 4, if base is 4, is _____

To find units digit of any number raised to any power :

| $2^1 = 2,$ | $2^2 = 4,$ | $2^3 = 8,$ | $2^4 = 16,$ | $2^5 = 32,$ |

After every fourth power units digit repeats itself

∴ Cyclicity of 2 is "four"

Now, let us discuss the cyclicity of other numbers

$3^1 = 3$
$3^2 = 9$
$3^3 = 7$
$3^4 = 1$
$\overline{3^5 = 3}$

cyclicity of 3 is 4

$7^1 = 7$
$7^2 = 9$
$7^3 = 3$
$7^4 = 1$
$\overline{7^5 = 7}$

cyclicity of 7 is 4

$8^1 = 8$
$8^2 = 4$
$8^3 = 2$
$8^4 = 6$
$\overline{8^5 = 8}$

cyclicity of 8 is 4

$4^1 = 4$
$4^2 = 6$
$\overline{}$
$4^3 = 4$
$4^4 = 6$

∵ after every 2nd power, units digit repeats itself
∴ cyclicity of 4 is equal to 2

$9^1 = 9$
$9^2 = 1$
$9^3 = 9$
$9^4 = 1$
$\overline{9^5 = 9}$

cyclicity of 9 is 2

$5^1 = 5$
$5^2 = 5$
$5^3 = 5$

cyclicity of 5 is 1

$6^1 = 6$
$6^2 = 6$
$6^3 = 6$

cyclicity of 6 is 1

? Quiz

1	Units digit of $(4)^{275642}$
2	Units digit of $(9)^{5642874}$
3	Units digit of 2^{193}
4	Units digit of $(12)^{56} \times (19)^{561} \times (17)^{168}$

Direct and Inverse Proportions

Direct Proportion

If the relationship of variables x and y can be expressed as

$$x \propto y \text{ or } \left[\frac{x_1}{x_2} = \frac{y_1}{y_2}\right]$$

$\boxed{x = ky}$, where k is constant, then we say that x varies directly with y

Inverse Proportion

If the relationship of variables x and y can be expressed as

$$x \propto \frac{1}{y} \text{ or } \left[\frac{x_1}{x_2} = \frac{y_2}{y_1}\right]$$

$\boxed{x = \dfrac{k}{y}}$, where k is any constant, then we say that x varies inversely with y

5 **If x varies directly with y, x = 4 when y = 14 ,then find x when y = 20.**

Quiz

Proportion

If the ratio of the first quantity to the second is equal to the ratio of the third quantity to the fourth

$$a : b : : c : d$$

or $\boxed{\dfrac{a}{b} = \dfrac{c}{d}}$, then they are called in proportion.

Where a and d are extreme terms and b and c are mean terms

$$a : b : : c : d \Rightarrow \boxed{\dfrac{a}{b} = \dfrac{c}{d}}$$

Product of extremes = Product of means

$$\boxed{ad = bc}$$

6 If $x : 4 : : 5 : 6$, then find x.

Quiz

Time and Work Formula

If A, B and C are working alone and can complete a work in x, y and z days respectively, then they will together complete the work in	If A can do a piece of work in x days and B can do a piece of work in y days, then both of them working together will do the same work in	If A can finish a work in x days and B is k times efficient than A, then the number of days taken by both A and B, working together to complete the work is	Two persons A and B, working together, can complete a piece of work in x days. If A working alone, can complete the work in y days, then B working alone, will complete the work in
$\dfrac{xyz}{(xy + yz + zx)}$ days	$\dfrac{xy}{(x + y)}$ days	$\dfrac{x}{(1 + k)}$	$\dfrac{xy}{(y-x)}$ days

Ratio and Proportion Puzzle

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

DIRECTPROPORTION

FRACTION

INVERSEPROPORTION

PERCENT

PROPORTION

RATEOFCHANGE

RATIO

SCALEFACTOR

Crossword grid answers:

- 1 Down: POWER
- 2 Across: TWO
- 7 Across: THREE
- 8 Across: FOURTH
- 3 Down: SQUARE
- 4 Down: EXPONENT
- 5 Down: ZERO
- 6 Down: EIGHT
- 9 Down: CUBE
- 10 Across: ONE
- 11 Across: ITSELF
- 12 Down: FIVE
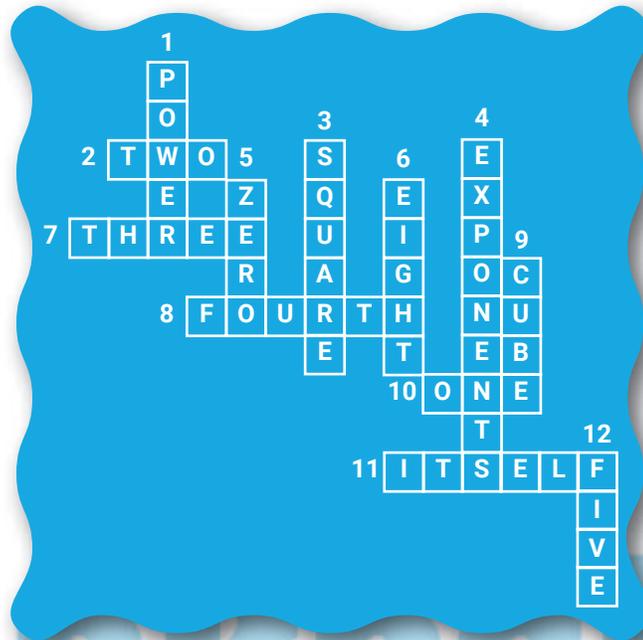
Answer (Ratio and Proportion Puzzle)

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

1 Quiz

Sol. Units digit of $(4)^{275642}$ = 6

[Cyclicity of 4 is 2]
[∵ 275642 is even]

2 Quiz

Sol. Units digit of $(9)^{5642874}$ = 1

[Cyclicity of 9 is 2]
[∵ 5642874 is even]

3 Quiz

Sol. 2^{193} [∵ cyclicity of 2 is 4]

$2^{4 \times 48 + 1}$

$(2^4)^{48} \times 2^1$

$(2^4)^{48}$ gives 6 as units digit

So, 6 × 2 = 12

Units digit of 2^{193} is 2.

4 Quiz

Sol. $(12)^{56} \times (19)^{561} \times (17)^{168}$

$2^{56} \times 9^{561} \times 7^{168}$ [consider units digit only]

$2^{4 \times 14} \times 9^{odd} \times (7^4)^{42}$

$(2^4)^{14} \times 9^{odd} \times (7^4)^{42}$

$6 \times 9 \times (1)^{42}$ [∵ 9^{odd} = 9]

$6 \times 9 \times 1$ = 54

Units digit = 4.

5 Quiz

Sol.

∵ x varies directly
with y, x ∝ y

$\dfrac{x_1}{x_2} = \dfrac{y_1}{y_2}$

$\dfrac{4}{x_2} = \dfrac{14}{20}$

$x_2 = \dfrac{4 \times 10}{7}$ ⟹ $\boxed{x_2 = \dfrac{40}{7}}$

6 Quiz

Sol.

Product of extremes = Product of means

$4 \times 5 = 6x$

$x = \dfrac{4 \times 5}{6}$

⟹ $\boxed{x = \dfrac{10}{3}}$

Light

What do animals see?

Question

Answer

We all have heard that dogs are colourblind and that bats are completely blind, but that's not entirely true. Bats can see, just not well, while dogs are only colourblind from our perspective. We have three colour receptors, while dogs have only two. They can't see red. A squid can only see in blue, a snake can see very little "normal" colour but can see in infrared while bees can see in blue, yellow and ultraviolet. Some butterflies have our three colour receptors and then an extra two: red, green, blue and two more. The mantis shrimp has up to 16 photoreceptors and can see UV, IR, visible and polarised light. They also can perceive depth with one eye and move each one independently.

What makes a banana look yellow? When white light hits the banana all of the colours get absorbed except for yellow, which is reflected back into our eyes.

Question

What colour do object really have?

Answer

Experiment to Bend the Light

Material required – Empty bottle, water , thin metal pin, laser .

1. Poke a hole into the middle of a water bottle with a metal.

2. Fill the bottle with water.

3. Make sure the hole is in the middle or just below the middle of the bottle so the water flows well.

4. Cover the hole with a piece of masking tape so that it doesn't leak immediately when you add water.

5. Fill it completely to the top and leave the lid off. The pan will catch the water as it drains out when you remove the tape.

6. Aim the beam of a laser pointer through the bottle at the hole.
   And you will see the bending in real.
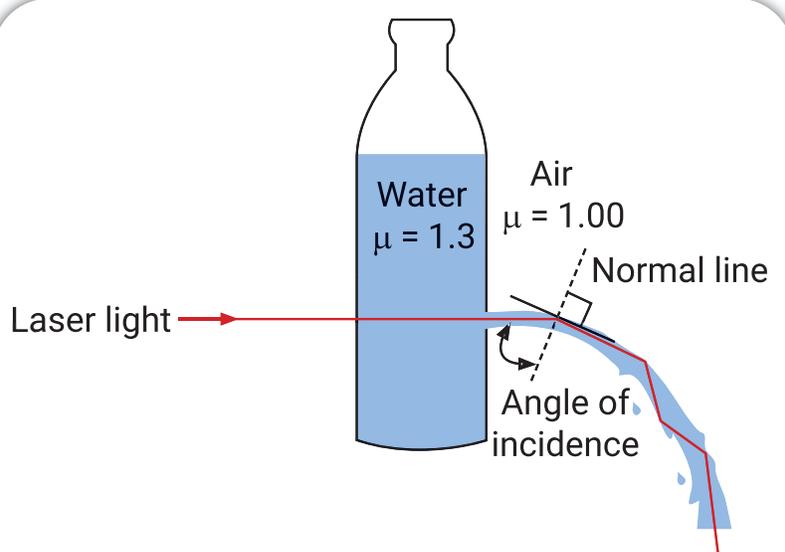
Facts About Light
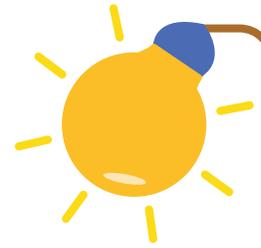
1. Light from the sun takes about 8 minute and 17 second to reach earth.

2. In countries like Japan and Scotland, the street light switch to blue light because it has calming effect on human beings. This has resulted in low case of crime and suicides.

3. Visible light makes up less than one ten billionth of the electromagnetic spectrum, which stretches from radio waves to gamma rays.

4. Red, green and blue are the primary colours of light.

5. UV light are often used by forensic scientists to see details that are not seen by the naked eye.

6. A 'jiffy' is an actual unit of time. It is the time it takes for light to travel one centimeter in a vacuum, which is about 33.3564 picosecond.

7. Humans are bioluminescent. However, the light emitted by our body is 1000 times weaker than our eyes can pick up.

8. Peacock feathers are actually brown, but have microscopic structures that interfere with light that make the bright iridescence.

9. The Hope Diamond glows red when exposed to UV light, fueling its cursed reputation.

10. The element Selenium conducts electricity only when a light is shined on it. In the dark, it is an insulator.

11. When ultrasonic sound waves are created in a pool of water, tiny air bubbles are created, which emit a tiny burst of light.

Combustion and Flame

Fire Safety in the Home

Keep candles, mosquito coils, incense sticks away from furniture

Install and maintain smoke detector

Keep a reliable fire equipment ready

Double check that the appliances are switched off after use

Don't overload circuits

Never play with matches and lighters

Crossword
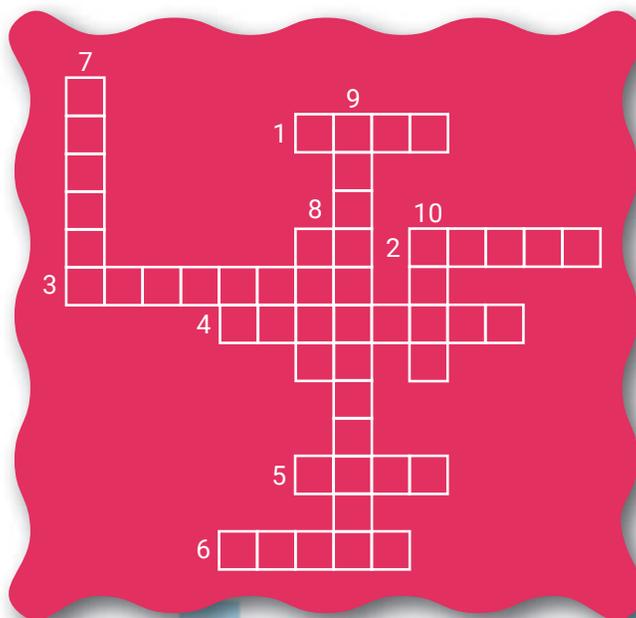
ACROSS

1. Non-luminous zone is _____ in colour. [4]

2. A region of burning gases with high illumination and light intensity. [5]

3. Rain that causes damage to trees, crops, buildings and rivers. [8]

4. Liquid fuel with calorific value 45000 kJ/kg. [8]

5. _____ is a combustible substance. [4]

6. Most commonly used fire extinguisher. [5]

DOWN

7. Burning of fuels causes respiratory diseases such as _____ [6]

8. Uncontrolled destructive burning is called _____ [4]

9. Zone in which incomplete combustion takes place. [12]

10. Concentrated store house of energy is known as _____ [4]

Interesting Facts

1. Fire triangle represents the three components that fire needs to exist: heat, oxygen and fuel. Fire is extinguished when one or more of these components is/are missing.

2. A gallon of gasoline has the explosive potential of 30 sticks of dynamite.

3. Air is 21 percent oxygen which combines with acetylene and you get an oxyacetylene welding torch that burns at over 5500 degree fahrenheit, the hottest fire you encounter.

4. The heat from a fire alone is enough to kill. It can get as hot as 315 degree celsius at eye level , hot enough to scorch your lungs if you breathe it in and to melt the clothes you're wearing into your skin.

5. During wildfires it's amazing that trees can explode if water deep inside the tree quickly turns to steam.

6. More people die from smoke inhalation than flames. Fire can suck all of the oxygen from a room and fills it with poisonous smoke and gases before flames even reach a room.

7. Fire can make water. Place a cold spoon over a candle and you will observe the water vapors condense on the metal. Wax contains hydrogen which combines with oxygen to make water.

8. Oxygen supply influences the color of the flame. A low oxygen fire gives off a yellow glow. A high oxygen fire burns blue.

9. Earth is the only known planet where substances can burn to produce fire. Everywhere else you don't find enough oxygen for fire to occur.

10. The ancient greeks amazingly started fire with concentrated sunlight. A parabolic mirror that focuses solar rays is still used to ignite the olympic torch.

1. Goldsmiths use the 'X' zone of a flame with a metallic blow pipe for melting gold or silver . Colour of 'X' zone is
   - (a) Black
   - (b) Blue
   - (c) Orange
   - (d) Yellow

2. Global warming leads to the rise in the sea level causing floods in the coastal areas. One of the main reasons of global warming is
   - (a) Combustion of fuels releases sulphur dioxide which decreases the temperature of atmosphere
   - (b) Combustion of fuels releases carbon monoxide which decreases the temperature of atmosphere
   - (c) Combustion of fuels releases unburnt carbon particles which causes decrease in temperature of atmosphere
   - (d) Combustion of fuels releases carbon dioxide which causes increase in temperature of atmosphere

3. Read the given statements and select the correct options.

   Statement 1 : Kerosene oil and wood do not catch fire on their own at room temperature.

   Statement 2 : A combustible material cannot catch fire as long as its temperature is lower than its ignition temperature.

   - (a) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1
   - (b) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1
   - (c) Statement 1 is true and statement 2 is false
   - (d) Both statements 1 and 2 are false

4. What are the two main hydrocarbons present in L.P.G.?
   - (a) Butane + propane
   - (b) Butane + isobutene
   - (c) Propane + ethane
   - (d) Methane + ethane

Answer (Crossword)

```
7
A              9
S        1 B L U E
T          U
H        8 M      10
M        F I  2 F L A M E
3 A C I D R A I N  U
      4 K E R O S E N E
          E    U    L
          U    S
          S    Z
      5 C O A L
          N
      6 W A T E R
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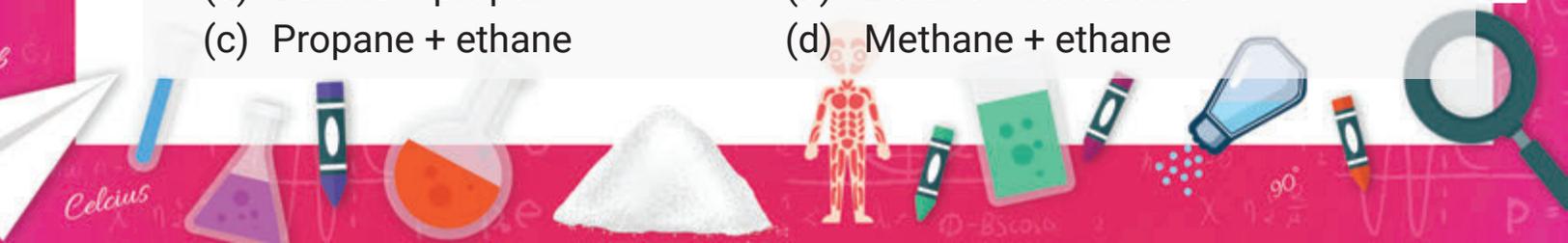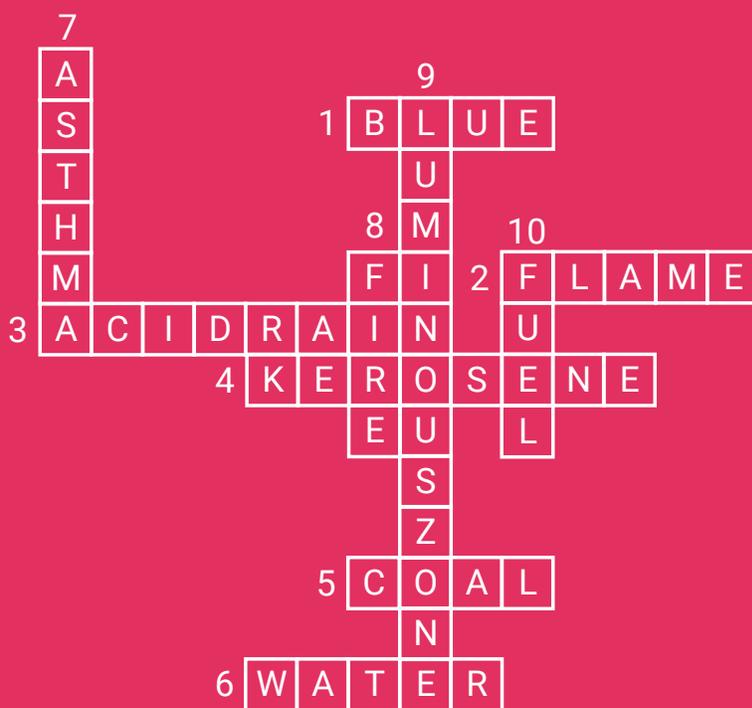
Answer ?

Quiz

1. **Ans.** **(b)** Blue

2. **Ans.** **(d)** Combustion of fuels releases carbon dioxide which causes increase in temperature of atmosphere.

3. **Ans.** **(a)** Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1

4. **Ans.** **(a)** Butane + propane

Reaching the Age of Adolescence

Puberty- Myths and Facts

Myth 1
If a female has her period she cannot swim, run, etc.

Fact
During her period, a female can do anything she normally does. Exercise helps to reduce cramps and improve mood. Use tampons or menstrual cups for swimming.

Myth 2
It is not normal for boys to release semen in their sleep.

Fact
This is completely natural—nocturnal emissions or "wet dreams". This often happens when boys have sexual dreams.

Myth 3
A female cannot get pregnant if she has sex during her period.

Fact
A female can get pregnant any time she has sex without reliable birth control. Sperm survive up to five days inside the female body and ovulation can happen during a period. There is a chance the sperm and egg will get together. A sexually active couple—male and female, that do not want to get pregnant, should always use reliable birth control.

Myth 4

Period blood is impure.

Fact

Menstruation is an absolutely natural process. Actually menstrual discharge does not contain any toxic components. About half of menstrual fluid is blood. Other components include calcium, iron, sodium, cervical mucus, etc. It is no more dangerous than regular blood.

Mom I cried a lot in school today. All my friends teased me because of my pimple.

You are 11 years now. Scientifically, you have hit puberty. It is very natural to get pimples. Don't get bogged down by such laughs. Everyone gets them at one point or other.

But mom Anita was saying things like I am dirty and I don't wash my face that's why I am getting them.

She is young now. She doesn't know much. Do not listen to what she is saying. Pimples come because of hormonal or you can say chemical changes taking place inside you because your body is getting ready for things like menstruation, pregnancy etc. So don't worry it's very normal.

Thanks mom that helps a lot. I will let all of them know tomorrow that it's just a part of growing up.

Location of Endocrine Glands
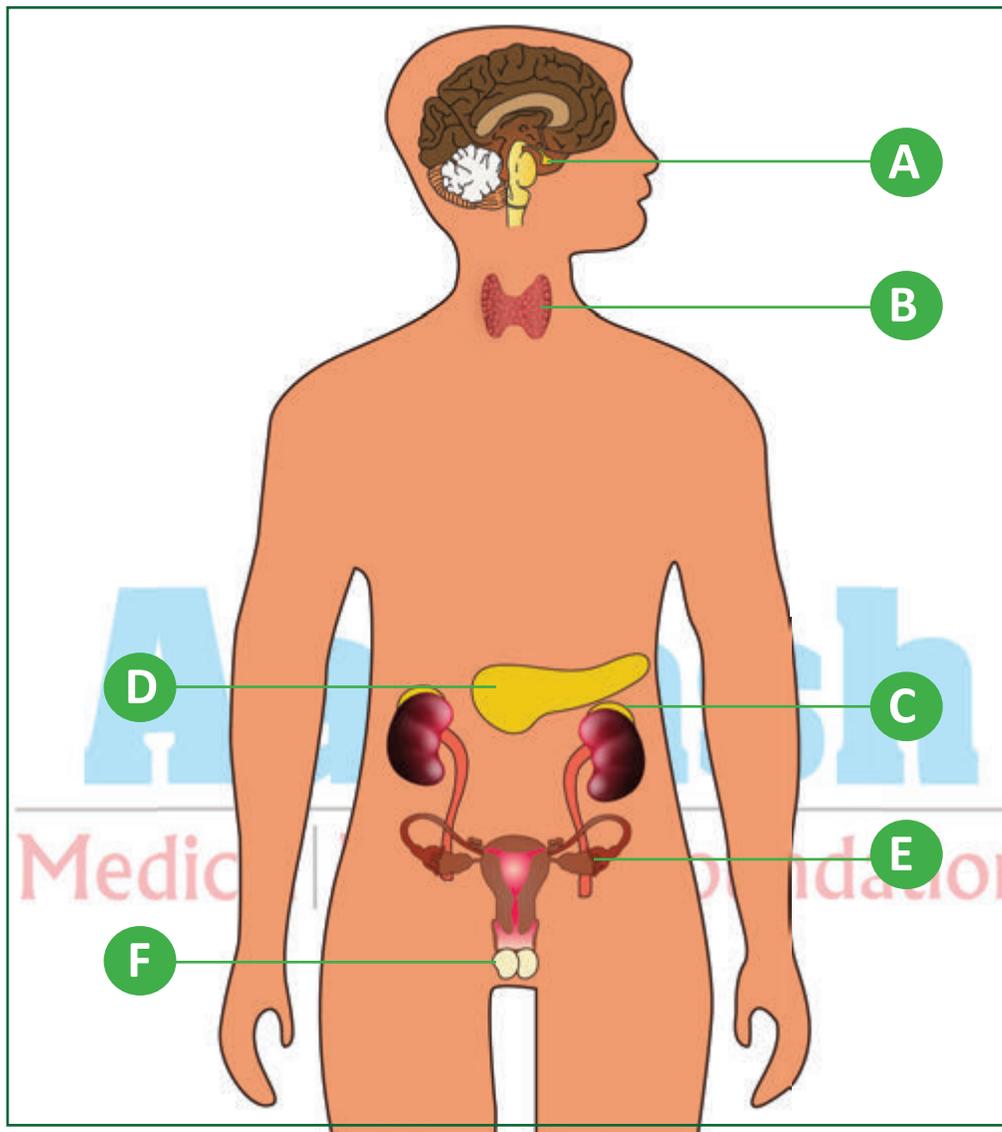
S.No.	Endocrine Glands	Hormones Released
1	A	
2	B	
3	C	
4	D	
5	E	
6	F	

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Hormonal Etymology

1. **Puberty** — *pubertas* — 'adult'

2. **Adolescence** — *adolescere* — 'grow to maturity'

3. **Endocrine** — *Endo + Krine* — endo means 'within', and "Krine means 'to secrete',"

4. **Hormone** — *hormōn* — 'to set in motion'

5. **Tropism** — *tropē* — 'turning'

6. **Gigantism** — *gigant* — 'giant'

7. **Ecdysis** — *ekdusis* — 'to take off'

8. **Pituitary** — *pituitarius* — 'secreting or containing mucous'

9. **Insulin** — *insula 'island'* — As it is released from islets (Beta cells) of Langerhans

10. **Pancreas** — *Pan + Kreas* — Pan means 'all' and Kreas means 'flesh'

The secret code of your body

Your body is a magical place run by the symphony of chemicals. From birth to death each process is affected by a whole set of hormones which orchestrate the body's growth, repair & development. Let us see how many of these chemicals can you guess?

1.

Hint: With beard, moustache & a muscular body, I can change you from a boy to a man. You may grow taller a little too late, the voice changes you may not understand!

2.

Hint: I'll save your extra sugar in the liver, when you binge on the Diwali sweets leftover.

3.

Hint: I make the milk for the new born, till they start eating their corn.

4.

Hint: I'm the magician that turns the tadpoles into frogs & regulates growth and development of the human body.

5.

Hint: I was the one that brought you out in the world dear.

6. ☐☐◯☐☐☐☐☐☐☐☐

Hint: In flight, fight or fright, I'll keep your heart beating. I'll do whatever I can to make sure, you adjust your body during stress.

7. ◯☐☐☐☐☐☐☐☐☐☐

Hint: I will repair your skin & control your body's clock, but I'm only released in the dark.

8. ☐☐☐☐☐☐☐◯☐

Hint: In hunger & fasting, I won't let you faint, I'll raise your blood sugar, with no constraint.

9. ☐☐☐☐☐☐☐☐☐☐☐☐☐◯

Hint: I grow, grow, grow your body till you reach a certain height, I can turn you tall or a tiny dwarf, if I might!

10. ☐◯☐☐☐☐☐☐☐

Hint: Though, I'm just a chemical, I carve out the women in you, the voice, the curves, & a little acne to make you a little extra special!

Hint: We are what we are because of ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

Location of Endocrine Glands

S.No.	Endocrine Gland	Hormones Released
1	A- Pituitary gland	Growth hormone
2	B- Thyroid gland	Thyroxine
3	C- Adrenal gland	Adrenaline
4	D- Pancreas	Insulin
5	E- Ovary	Oestrogen
6	F- Testis	Testosterone
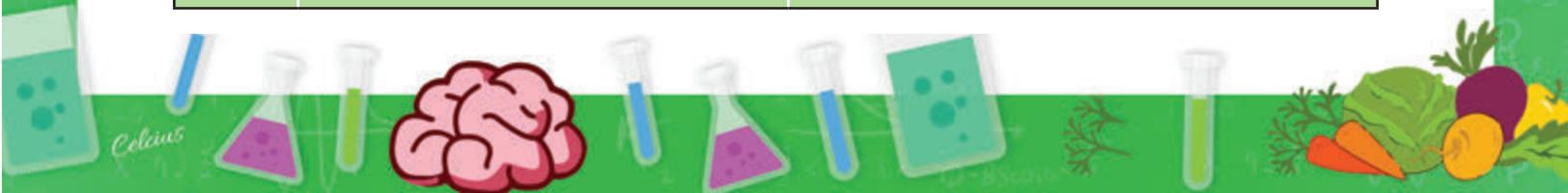
Answer (The secret code of your body)

1. T E S T O S T E R O N E

2. I N S U L I N

3. P R O L A C T I N

4. T H Y R O X I N E

5. O X Y T O C I N

6. A D R E N A L I N E

7. M E L A T O N I N

8. G L U C A G O N
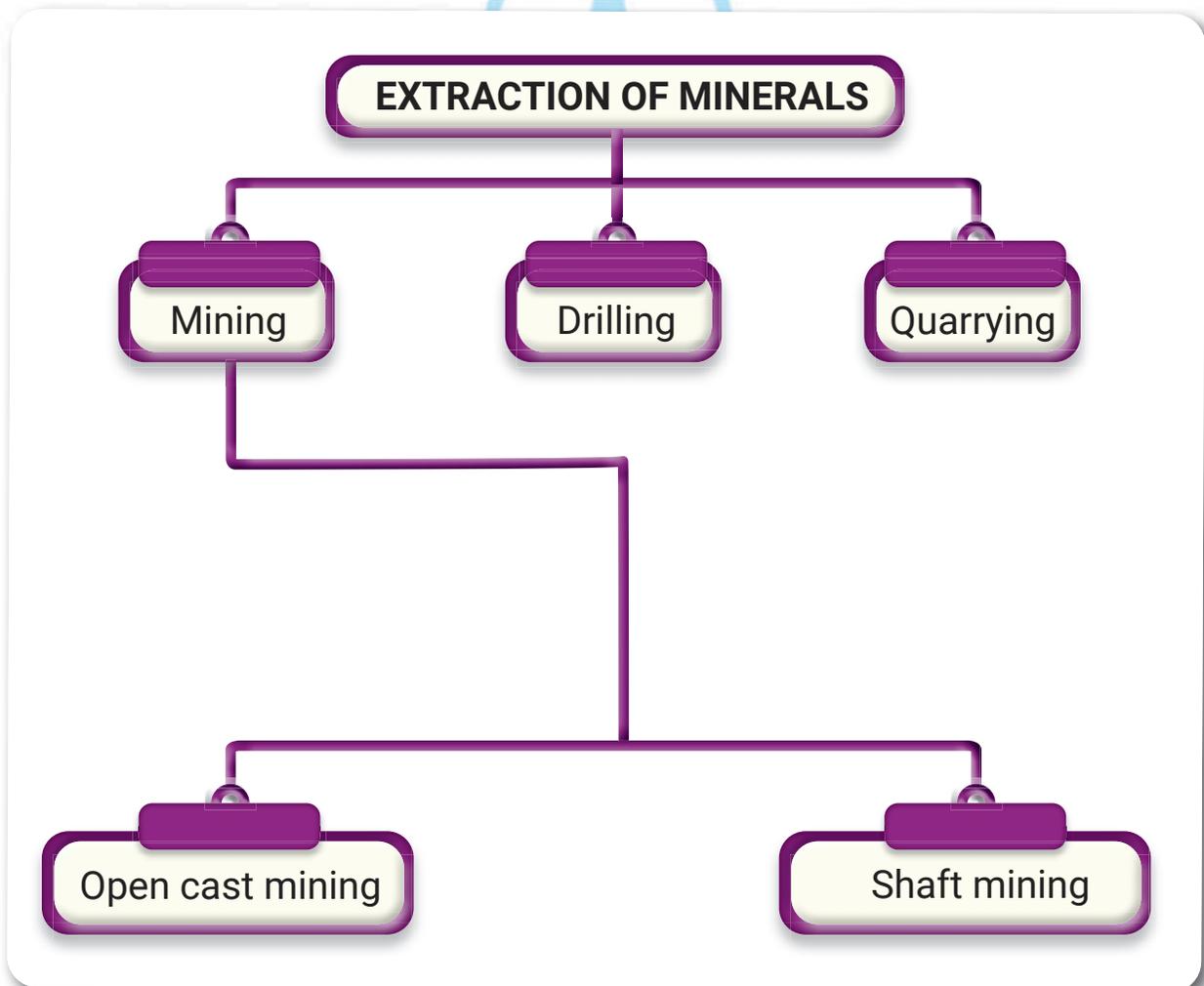
9. S O M A T O T R O P I N

10. O E S T R O G E N

O U R   H O R M O N E

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Mineral and Power Resources

EXTRACTION OF MINERALS

- Mining
- Drilling
- Quarrying

Mining:
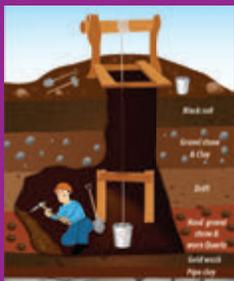- Open cast mining
- Shaft mining

Extraction of Minerals

Mining

Process of taking out minerals from rocks buried under the earth's surface

Open-cast Mining

Minerals that lie at shallow depths are taken out by removing the surface layer

Shaft Mining

Extraction of minerals from greater depth by creating deep bores (shafts)

Drilling

Extraction of minerals that occur far below the earth's surface
Example : Petroleum and Natural Gas

Quarrying

Extraction of minerals that lie near the earth's surface

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Jumbled Paragraphs

Q.1

S1: Walmart-owned Flipkart on December 18 said

    (a) 2020 as compared to last year,

    (b) its platform by sellers as well as customers

    (c) it has registered close to 35 percent increase in sellers onboarded in

    (d) and has seen strong adoption of

S6: from tier II regions and beyond.

    (a) abcd   (b) bcad

    (c) cadb   (d) bdca

Q.2

S1: To succeed, you must have tremendous perseverance,

    (a) Have that sort of energy,

    (b) tremendous will. "I will drink the ocean," says the persevering soul,

    (c) "at my will mountains will crumble up."

    (d) that sort of will, work hard,

S6: and you will reach the goal.

    (a) abcd   (b) bcad

    (c) cadb   (d) bdca

Q.3

S1: Smog can irritate the eyes

(a) It's even worse for people who have asthma or allergies

(b) —these extra pollutants

(c) and throat and also damage the lungs—

(d) especially of people who work or exercise outside, children, and senior citizens.

S6: only intensify their symptoms and can trigger asthma attacks.

(a) abcd   (b) bcad

(c) cdab   (d) bdca

Q.4

S1: India, also known as Bharat, is a Union of States.

(a) It is a Sovereign Socialist Secular Democratic Republic

(b) Constitution of India which was adopted by the Constituent Assembly

(c) with a parliamentary system of government.

(d) The Republic is governed in terms of the

S6: on 26th November, 1949 and came into force on 26th January, 1950.

(a) abcd   (b) bcad

(c) cadb   (d) acdb

Answer (Jumbled Paragraphs)

| Q.1 | → Ans. | (c) cadb | Q.3 | → Ans. | (c) cdab |
| Q.2 | → Ans. | (b) bcad | Q.4 | → Ans. | (d) acdb |

Statement Analysis & Classification

(?) Quiz

Directions (Question 1 and 2) : In each of the following questions, a statement is given followed by two conclusions I and II. Give answer :

(a) only conclusion I follows;

(b) only conclusion II follows;

(c) either conclusion I or II follows;

(d) neither conclusion I nor II follows;

(e) both conclusion I and II follows;

1 Statement

The oceans are a storehouse of practically every mineral including uranium and petroleum. But petroleum is found in abundant quantity.

Conclusions

I. The oceans are a cheap source of petroleum.

II. The oceans are good source of sea foods.

2 Statement

It has been decided by the Ministry of Agriculture and Rural Development to withdraw 30% of the subsidy on fertilizers from the beginning of next month.

Conclusions

I. Farmers no more desire or need such subsidy from government as they can afford increased price of the fertilizers.

II. The price of the fertilizers will increase at least by 30% from the next month.

3 **Assertion (A)**

Carbon monoxide when inhaled causes death.

Reason (R)

Carbon monoxide combines with water.

4 **Assertion (A)**

We do not feel colder on mountains than on plains.

Reason (R)

Temperature increases with altitude.

5 (a) Curd   (b) Owl   (c) Butter   (d) Cream

6 (a) Seminar   (b) Semicolon   (c) Semifinal   (d) Semicircle

7 (a) Ghosts   (b) Spirits   (c) Skeletons   (d) Devil

Directions (Question 8 to 12): In each of the following questions; four numbers/words are given out of which three are alike in some manner while one is different. Choose the one which is different from the rest three.

8   (a) 19   (b) 29   (c) 15   (d) 17

9   (a) 1   (b) 49   (c) 132   (d) 154

10   (a) 41   (b) 61   (c) 81   (d) 83

11   (a) Wool   (b) Honey   (c) Silk   (d) Lac

12   (a) Frost   (b) Sky   (c) Rain   (d) Mist

Answer Quiz ?

1 **(a)** I follows but II is out of context of the sentence.

2 **(d)** I does not follow because a government's policy is not determined merely by people's needs.

3 **(c)**

4 **(e)**

5 **(b)** Owl

6 **(a)** Seminar

7 **(c)** Skeletons

8 **(c)** 15

9 **(a)** 1

10 **(c)** 81

11 **(a)** Wool

Explanation : All except Wool are products obtained from insects, while wool is obtained from sheep.

12 **(b)** Sky

Explanation : All except Sky are different forms of precipitation.

Advantages of Starting Early in Foundation Years

With the competition getting stiffer with each passing day, students need to develop the right skills and aptitude from an early stage in order to gain a competitive edge over others. It gives the right direction in terms of career planning and exposes students to efficacious strategies that would help them to smoothly cruise through their exams.

If you are still pondering over whether or not to start your preparation early in foundation years, reading further may prove to be of some help.

Advantages of Starting Early in Foundation Years

Develops Skills

Cracking competitive examinations is all about having adept skills. Training your mind at an early stage helps to develop logical, reasoning and analytical skills which require gradual grooming. Once your mind gets accustomed to rational thinking and develops cogent thought process, preparing for competitive exams in senior classes doesn't appear to be a tough nut to crack. The ability to visualise and bloom ahead isn't a product of mere rote-learning. It requires innovative learning and discussion-based adaptive learning right from the start.

Gives Competitive Edge & Lays Strong Foundation

Once you start developing your critical thinking skills, you'll acquire an edge over others right from the beginning. Your fundamental understanding and problem-solving skills will already be developed by the time your peers start their preparation in senior classes.

Bridges the Gap between School Exam Pattern & Competitive Exam Pattern

The school curriculum and exam pattern are different from competitive examinations. While the school exam pattern focuses more on knowing the concepts, competitive exam pattern focuses on the application of the concepts. Starting early in foundation years helps you to bridge this gap at an early stage and prepare for both school and competitive examinations simultaneously.

Exposure to Competitive Environment

Starting early in foundation years provides you with the necessary exposure by preparing you for scholarship examinations such as NTSE and several Olympiads, conducted at national and international levels. It fosters an environment that promotes discipline and drives you to work hard and dedicatedly towards your goal. It instils in you a competitive spirit that is essential to succeed in life.

Builds Time Management Skills

Success in competitive examinations depends on good time management skills. Starting early in foundation years will not only teach you time management among other skills at an early age but also help you to manage your time between school and competitive exam preparation in an effective way.

Prepares for the Future

No learning or training is effective unless it prepares you to overcome challenges from an early stage by gradually developing your skills, temperament and instilling in you immense confidence. Moreover, you will learn to strive ahead under academic pressure at an early stage.

What makes Foundation @Aakash the smartest choice ?

- Nurtures you with personalized attention in a competitive atmosphere.

- Improves your performance in school & board examinations.

- Builds your analytical & reasoning skills to succeed in Olympiads & Scholarship examinations such as NTSE.

- Lays the strong groundwork for entrance examinations such as NEET, JEE, UPSC, IAS, IFS, CAT, MAT, etc.

- Introduces you to innovative learning methods to make learning fun, engaging and easy.

- Focuses on conceptual and application-based learning, thereby debunking old rote-learning methods.

- Indulges in more than just academic syllabi.

- Offers you competitive exposure through national level test series that enables you to know your potential at all India level.

Fundamentally, "the key to success is to start before you are ready". Starting early in foundation years can help you in planning strategically for the future. You can utilise the early years wisely by focusing on in-depth learning where you can give more time to understanding lessons and grasping concepts. Foundation @Aakash is an opportunity to build the tomorrow you want today. Aakash Foundation courses not only help you pass school/board exams with flying colours but also crack competitive scholarship exams and Olympiads held at national as well as international level.

Happy Birthday

Sir Ernest Rutherford
New Zealand English Chemist & Physicist

Born - 30 Aug 1871
Died - 19 Oct 1937

Rutherford's Nuclear Model of the Atom

- ☐ The nucleus is very small, dense, and positively charged.
- ☐ Electrons surround the nucleus.
- ☐ Most of the atom is empty space.
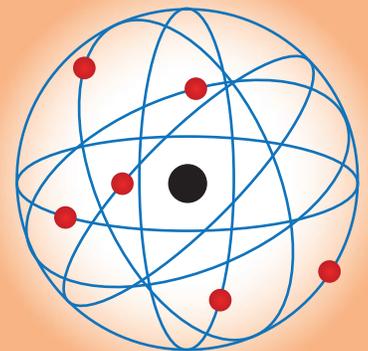
Ernest Rutherford publishes his discovery of two different kinds of Radiation (Alpha and Beta Particles) Ernest Rutherford, 1st Baron Rutherford of Nelson, was a new zealand-born British physicist who came to be known as the father of nuclear physics.

In 1908 he was awarded the Nobel Prize for Chemistry

NEET 2025 Wasn't Easy. Our Results Say Otherwise.

5 AAKASHIANS IN TOP 10 AIR NEET(UG) 2025

AIR 9 — 675/720
HARSH KEDAWAT
1 YEAR CLASSROOM

AIR 3 — 681/720
KRISHANG JOSHI
MAHARASHTRA TOPPER
3 YEAR CLASSROOM

AIR 2 — 682/720
UTKARSH AWADHIYA
MADHYA PRADESH TOPPER
3 YEAR CLASSROOM

AIR 5 — 680/720
AVIKA AGGARWAL
3 YEAR CLASSROOM
ALL INDIA FEMALE TOPPER

AIR 10 — 675/720
AARAV AGRAWAL
1 YEAR CLASSROOM

OUR NATIONAL TOPPERS IN NEET (UG) 2025

AIR 11 — 674/720
Arsh Gandhi
2 Year Classroom

AIR 16 — 670/720
Rachit S Chaudhuri
2 Year Classroom

AIR 20 — 666/720
Rupayan Pal
1 Year Classroom

AIR 23 — 665/720
Gourav Yadav
3 Year Classroom

AIR 25 — 665/720
Abhijeet Kulhari
1 Year Classroom

AIR 28 — 663/720
Himank Baghla
2 Year Classroom

AIR 29 — 663/720
Tanisha
3 Year Classroom

& many more...

Our Problem *Solvers* shine bright in JEE (Advanced) 2025

Our Top 100 AIR

Advay Mayank
AIR 36
Aakash Invictus
Classroom Program

Rujul Garg
AIR 41
2 Years
Classroom

Arush Anand
AIR 64
Aakash Invictus
Classroom Program

Shreyas Lohiya
AIR 68
Aakash Invictus
Classroom Program

Kotha D Reddy
AIR 74
2 Years
Classroom

Krishna Agrawal
AIR 75
3 Years
Classroom

Divyant Jayakumar
AIR 80
Aakash Invictus
Classroom Program

Aayush Agarwal
AIR 90
4 Years
Classroom

Akash Deep
AIR 99
2 Years
Classroom

Aakashians Create History in International Olympiads
(Classroom Program Students)

IBO 2023
Gold Medalists
34th International Biology Olympiad

Dhruv Advani

Rohit Panda

Chirag Falor
IOAA 2019
Gold Medalist
International Olympiad on Astronomy & Astrophysics

Dhiren Bhardwaj
IBO 2021
Silver Medalist
32nd International Biology Olympiad

Anshul
IBO 2021
Silver Medalist
32nd International Biology Olympiad

Amritansh Nigam
IBO 2022
Silver Medalist
33rd International Biology Olympiad

Prachi Jindal
IBO 2022
Silver Medalist
33rd International Biology Olympiad

Tanishka Kabra
IChO 2022
Silver Medalist
54th International Chemistry Olympiad

1484 Students Scored Above MAS

420 Classroom Students **Qualified in NSEs* 2024-25**

(Group A & B) **49** NSEA*

(Group A & B) **229** NSEB*

(Group A & B) **70** NSEC*

(Group A & B) **38** NSEP*

34 NSEJS*

Aakashians Qualified for INO-2025

Krishna Agrawal
NSEA | NSEP | NSEC

Mohit Shekher Shukla
NSEA | NSEP | NSEC

Utkarsh Awadhiya
NSEB | NSEP | NSEC

Rupayan Pal
NSEC | NSEB | NSEP

Devansh Garg
NSEJS

Aaron Thakkar
NSEJS

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 RMO 2024

899
Classroom Students
Qualified in IOQM 2024

Joish Achyuta
Class - VIII

Dhanush Damu
Class - IX

Arnav Singh
Class - X

Pranit Goel
Class - XI

Aayush Agarwal
Class - XII

and many more...

Aakashians Qualified for INMO 2025

161
Classroom Students
Qualified in RMO 2024-25

Kotha D Reddy
Reg. No. 00006657265

Abhipraya Verma
Reg. No. 00010407513

Aditya Singh
Reg. No. 00012631688

Rujul Garg
Reg. No. 00005153903

Mohit Shekher Shukla
Reg. No. 00006093814

and many more...

*

Aakashians Qualified for OCSC/IMOTC-2025

25
Classroom Students
Qualified in INOs 2025

Pranit Goel
Qualified INMO

Harshit Singh
Qualified INJSO

Subhrojit Paul
Qualified INBO

Mohit Shekher Shukla
Qualified INChO

Rujul Garg
Qualified INPhO

Aditya Singh
Qualified INAO Jr

and many more...

Aakashians Qualified for Merit Certificate

1019
Classroom Students
Qualified in IMO (Level-I) 2023-24

Intl. Rank **1**
Prisha Miglani
Class - IX

Intl. Rank **2**
Sushant Agarwal
Class - X

Intl. Rank **4**
Ekaashar Gupta
Class - IX

Intl. Rank **7**
Harshit Singh
Class - VIII

438
Classroom Students
Qualified in IMO (Level-II) 2024

and many more...

Aakashians Qualified for Merit Certificate

4902
Classroom Students
Qualified in NSO (Level-I) 2024-25

Intl. Rank **2**
Meghav Ladani
Class - X

Intl. Rank **2**
Anubhab Manna
Class - VIII

Intl. Rank **3**
Arnav Gupta
Class - IX

Intl. Rank **7**
Parshti Bajpai
Class - IX

Intl. Rank **10**
Shreya
Class - VIII

and many more...

* **RMO** -Regional Mathematical Olympiad | **INMO**-Indian National Mathematical Olympiad | **IOQM** - Indian Olympiad Qualifier in Mathematics | **NSO** - National Science Olympiad
IMO - International Mathematics Olympiad | **INOs** - Indian National Olympiads | **OCSCs** - Orientation cum Selection Camps | **IMOTC** - International Mathematical Olympiad Training Camp