THE CURIOUS MIND

For those who ask why, how, and what if

INTELLIGENCE:
Beyond the Brain.
How animals think & learn.

THE SCIENCE OF DOSA & IDLI:
The biology of fermentation and taste!

EXPLORING CAREERS IN BIOLOGY, BIRDS & WILDLIFE.
Finding your path with nature.

THE INFINITE LONELINESS OF PRIME NUMBERS
A mathematical journey.

MAY 2026 | ISSUE 5 | FOR STUDENTS, PARENTS & TEACHERS

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ISSUE 05 | MAY 2026

IN THIS ISSUE

Written & edited by Rohith Chakrathirtha

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From the Editor's Desk

Dear Reader,

Welcome to the fifth issue of *The Curious Mind* — a magazine that began with a simple conviction: that the greatest gift we can give any young person is not an answer, but a better question.

The response to our first four issues has been deeply encouraging. Your messages, your questions, your disagreements, and your curiosity have shaped this journey in ways we had only hoped for. It is with that same excitement that we bring you this latest issue.

As always, these pages carry stories that make you feel, science that makes you wonder, mathematics that makes you see the world differently, and ideas that stay with you long after you have put the magazine down. There are puzzles to puzzle over, careers to dream about, exams to prepare for, and books to fall in love with.

But more than anything, *The Curious Mind* continues to be a conversation. A conversation between a writer who has spent decades asking questions and readers — students, parents, teachers — who are at the beautiful beginning of their own questioning lives.

This magazine is free. Always. Because curiosity should never have a price tag.

Read it. Share it. Argue with it. And keep sending me your questions.

Rohith Chakrathirtha

Editor | The Curious Mind

The Right Crossroads

A story for young readers (Ages 10–18) | A story about vision, direction, and timing

Arjun was fourteen years old, and he had a problem that most adults do not understand: he was good at too many things.

He was good at drawing. He was good at mathematics. He could fix a bicycle in twenty minutes and explain a complex concept in a way that made his grandmother laugh and understand at the same time. His teachers called him 'gifted.' His parents called him 'their little genius.' His friends just called him Arjun, which was perhaps the most accurate description of all.

But Arjun felt lost.

Not lost the way you feel when you cannot find your keys. Lost the way you feel standing at a crossroads in a fog, knowing that somewhere ahead there is a destination, but unable to see which road leads there.

> ***Knowing what you want to become is not enough. You also need to know the right road — and find it at the right time.***

On a warm Tuesday afternoon, Arjun sat under the mango tree in his grandfather's garden, staring at a blank sheet of paper. His grandfather — a retired professor of mathematics — came and sat beside him without a word. He had learned, in seventy-three years of living, that silence is often the most useful thing you can offer another person.

After a long while, Arjun spoke.

"Thatha, do you know what you wanted to be when you were my age?"

His grandfather smiled. "I wanted to be a cricketer," he said.

Arjun stared. "But you became a mathematics professor."

"Yes. Because at fifteen, I happened to attend a lecture — quite by accident, I had gone to the wrong classroom — and a man was explaining how prime numbers work. Something shifted inside me. I suddenly knew."

"But how did you know?"

His grandfather was quiet for a moment. "Because the knowledge arrived at the right time. Not too early — I would not have understood. Not too late — I would have already chosen another road. The right knowledge at the right moment is a rare and precious thing, Arjun."

The Two Gifts

Arjun thought about this for many days. He noticed something: some of his friends knew exactly what they wanted to do. Priya wanted to be a surgeon since she was eight. Vikram had decided on software engineering by the time he was twelve. They had the first gift — clarity of vision.

But then he watched what happened to them. Priya worked extremely hard in biology but never once thought about which colleges she needed to target, which olympiads to attempt, which doctors she could shadow for experience. Vikram coded brilliantly but had no idea that there were entrance exams specifically for computer science, or scholarships he qualified for, or communities of young programmers he could join.

They had the vision. But they did not have the direction.

And then there were others — like his cousin Meena — who had done all the right things. She had attended workshops, cleared exams, built a portfolio, found mentors. But she still did not know what she actually wanted to do with her life. She had the direction, the path, the infrastructure. But no destination.

> ***A map is useless without a destination. A destination is unreachable without a map. You need both — and you need them at the same time.***

The Mentor Arrives

One Saturday morning, Arjun's school invited a guest speaker — a woman named Dr. Kavitha Suresh, who had gone from a small town in Tamil Nadu to becoming one of India's leading wildlife biologists. She spoke for forty-five minutes, and Arjun sat in the front row, barely breathing.

After the talk, he went up to her.

"Dr. Kavitha, how did you figure it out?" he asked.

She looked at him for a moment.

"I was exactly your age," she said, "when a teacher took me to Mudumalai forest for a school trip. I saw an elephant in the wild for the first time. And something in me recognised something in that elephant. I cannot explain it better than that."

"But how did you know what to do after that?" Arjun pressed.

"I had help," she said simply. "The right teacher arrived. The right book arrived. And I was ready to receive them — because I had already asked the question."

The Crossroads

That evening, Arjun did not draw. He did not solve any problems. He just sat and thought.

He realised that he had been waiting — waiting for someone to tell him what to do, or for a sudden bolt of clarity to arrive from nowhere. But now he understood something important: the clarity would not arrive while he was sitting still. You had to walk towards it.

He made a list. Not of careers. Not of subjects. He wrote down things that made him lose track of time. Things he would do even if no one was watching. Things that made him feel most completely himself.

The list had three items on it: explaining things to people, working with living systems, and building things.

He stared at the list for a long time.

Then he went to find his grandfather.

> ***The right question, asked at the right time, is the first step on every road worth travelling.***

The Letter

Six months later, Arjun wrote a letter to Dr. Kavitha. In it, he told her that he had decided to pursue medicine with a specialisation in public health — not because someone had told him to, but because he had spent those six months attending workshops, reading books, speaking to doctors, and sitting with his own thoughts.

He told her about the two gifts his grandfather had spoken of: vision and direction. And he wrote: 'I now know that I needed both, and I needed someone to help me find them. You were part of that help. My grandfather was part of that help. The book my teacher gave me was part of that help. I hope, one day, to be part of that help for someone else.'

Dr. Kavitha kept that letter for the rest of her life.

A NOTE FOR THE READER

If you are a student reading this and you feel like Arjun — good at things, but not sure which road to take — know this: that feeling is not a problem. It is the beginning of the search. The two gifts you need are (1) clarity about what matters to you, and (2) guidance about the right path. You do not have to find both alone. Ask. Read. Listen. Walk towards the question.

The Science of Dosa and Idli

How fermentation, biology, and physics come together in your breakfast plate

Every morning, in millions of kitchens across South India, something extraordinary happens. A thick, ivory-white batter is poured onto a hot iron griddle, and within minutes, a crisp, golden, hole-riddled dosa appears. Separately, a small mound of the same batter, poured into a steel mould, is steamed into a soft, spongy, perfectly round idli.

Same batter. Two completely different foods. Both delicious. Both, if you look closely enough, deeply fascinating pieces of science.

Part 1: What Is Fermentation?

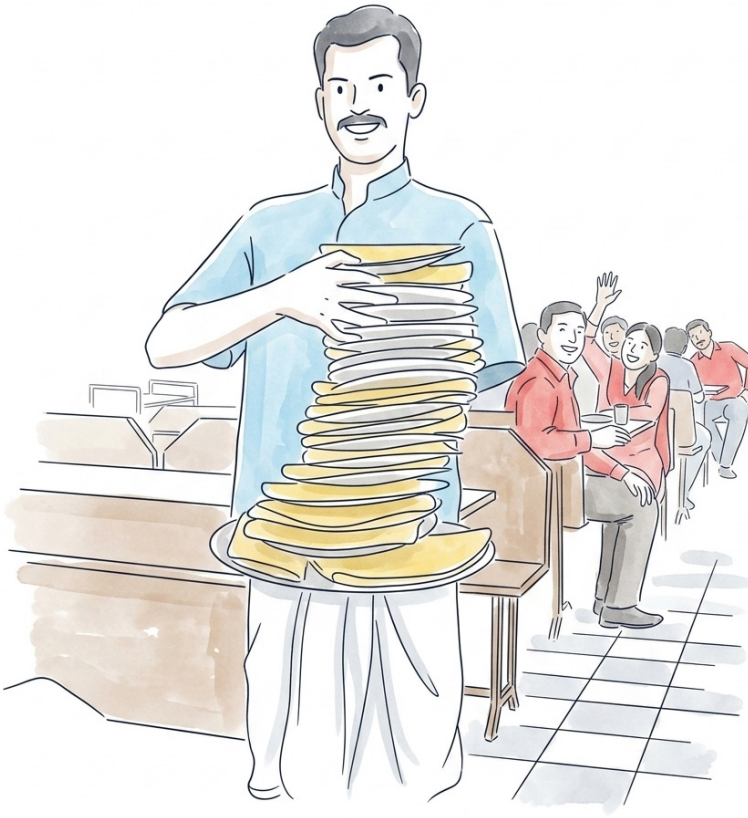
The journey of the dosa-idli batter begins the night before — or sometimes two nights before — when raw rice and urad dal (black lentils) are soaked separately in water, ground into a smooth paste, mixed together, and then left out at room temperature to rest.

What happens during this resting period is not rest at all. It is a frenzy of invisible activity.

Bacteria — primarily Leuconostoc mesenteroides and Lactobacillus species — that naturally live on the surface of the rice and dal begin to consume the carbohydrates in the batter. They break down sugars and produce two main byproducts: lactic acid and carbon dioxide gas.

The lactic acid gives the batter its characteristic slight sourness — and is also what makes fermented foods remarkably healthy, because lactic acid creates a hostile environment for harmful bacteria. The carbon dioxide gas gets trapped in the thick batter, creating millions of tiny bubbles throughout the mixture.

Fermentation is one of the oldest biotechnologies in human history. Your grandmother was a microbiologist long before the word was invented.



Part 2: Why Does the Dosa Have Holes?

Here is the first mystery: when batter is poured onto a hot griddle, those trapped carbon dioxide bubbles expand rapidly — because heat causes gases to expand (remember the Ideal Gas Law from your physics class?). As they expand, they push upward through the semi-liquid batter.

When a bubble reaches the surface and bursts, it leaves behind a small indentation — a hole. As the dosa sets and crisps from the heat, these holes become permanent.

The size and distribution of the holes depends on several factors: the temperature of the griddle, the thickness of the batter, how much carbon dioxide was produced during fermentation, and the ratio of rice to dal. Master dosa makers adjust all of these variables intuitively — they are, without knowing the terminology, applied chemists and physicists.

THE PHYSICS OF THE HOLE
1. Carbon dioxide is produced during fermentation and trapped in the batter
2. When batter hits the hot griddle, CO_2 bubbles expand rapidly (Gay-Lussac's Law)
3. Bubbles rise through the liquid batter to the surface
4. Each bubble bursts, leaving a small crater
5. The batter sets (cooks) around the crater, making it permanent
6. Result: the beautiful lacework pattern of a perfectly made dosa

Part 3: The Counter-Intuitive Idli

Now for the bigger puzzle: the idli.

You take liquid batter, pour it into a mould, and steam it with heat. The result is a solid, spongy cake. But wait — everything we know about matter says that applying heat to a liquid should make it more liquid, or eventually turn it into a gas (steam). So why does the idli become solid?

The answer lies in the chemistry of proteins, not just the physics of states of matter.

The batter contains proteins — primarily from the urad dal. When these proteins are heated, they undergo a process called denaturation. The heat causes the protein molecules, which are normally folded into complex shapes, to unfold and then re-bond with each other in new configurations. This cross-linking of proteins creates a solid, stable three-dimensional network — a matrix — that traps water molecules inside it.

The starch in the rice batter also plays a role: starch granules absorb water and swell when heated (gelatinisation), adding to the solidity and softness of the idli.

So the idli is not like an ice cube becoming water. It is more like an egg being boiled — a chemical transformation, not merely a physical one. Once the proteins have denatured and cross-linked, you cannot pour the idli back into liquid form. The change is irreversible.

The idli is not defying science — it is demonstrating chemistry that is more fundamental than the simple physics of solid, liquid, and gas.

Part 4: The Nutritional Science

Fermentation does not merely create gas and sourness — it profoundly changes the nutritional profile of the batter.

First, it increases the bioavailability of minerals. Rice and dal contain phytic acid, which binds to minerals like iron, zinc, and calcium and prevents the body from absorbing them. Fermentation significantly reduces phytic acid, releasing those minerals.

Second, fermentation partially predigests the proteins and carbohydrates, making them easier for your body to process. This is why idli and dosa are gentle on the stomach and are among the first solid foods given to infants in South India.

Third, the Lactobacillus bacteria that survive the cooking process (especially in slightly less-cooked preparations) act as probiotics — beneficial bacteria that support gut health.

DOSA - Key Science Points	IDLI - Key Science Points
Requires a hot griddle (180-220°C)	Requires steam (100°C)
CO_2 expansion creates holes	Protein denaturation creates solidity
Maillard reaction creates golden crust	Starch gelatinisation adds softness
Thin batter = crisp texture	Thick batter + steam = fluffy sponge

Part 5: Fascinating Facts You Did Not Know

The wild yeast: Traditional fermentation uses no added yeast or starter culture. The bacteria come naturally from the surface of the rice and dal, from the water, and even from the air in your kitchen. Different cities produce differently flavoured dosas because the microbial communities in the air are different. A Bengaluru dosa and a Chennai dosa made with the same recipe taste different — because the bacteria are different.

The iron tawa: A well-seasoned cast iron tawa is not just a culinary tradition — it actually adds small amounts of dietary iron to the food cooked on it. This is nutritionally significant.

Temperature matters: The ideal fermentation temperature is between 25°C and 32°C. Too cold and the bacteria are sluggish; too hot and competing, harmful bacteria can overgrow. This is why grandmothers in North India struggle to ferment dosa batter in winter, and why South Indian kitchens are naturally calibrated for perfect fermentation.

The ratio: The standard rice-to-dal ratio for idli is 3:1 or 4:1 (by volume, after soaking). For dosa, a slightly higher rice ratio gives a crispier result. These ratios encode hundreds of years of empirical experimentation by generations of cooks — a kind of slow-motion scientific optimisation.

Fenugreek's role: Many recipes add a small amount of fenugreek (methi) seeds to the dal before soaking. Fenugreek seeds contain their own natural yeast-like compounds and also increase the viscosity of the batter, helping it spread evenly on the griddle. They also add a subtle bitterness that balances the sourness.

The Infinite Loneliness of Prime Numbers

A meditation on the most mysterious objects in all of mathematics

Consider the number 17.

It cannot be divided evenly by any number except 1 and itself. It stands alone. It is not the product of any two smaller numbers. It is, in the vocabulary of mathematics, prime — and like all prime numbers, it carries within it a kind of irreducible solitude.

Prime numbers are simultaneously the simplest objects in mathematics and the most bewildering. Children learn about them in primary school. Professional mathematicians spend entire careers trying to understand them, and many of the deepest questions about primes remain unanswered.

This is a story about why.

What Is a Prime Number?

A prime number is a positive integer greater than 1 that has exactly two divisors: 1 and itself. The first few primes are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37…

The number 2 is the only even prime. All other even numbers are divisible by 2, so they have at least three divisors (1, 2, and themselves) and are therefore composite. This makes 2 uniquely peculiar — the oddest of the even numbers, you might say.

Every other number — 4, 6, 8, 9, 10, 12, 15, and so on — is composite: it can be broken down into smaller factors. And here is the fundamental theorem of arithmetic, one of the most beautiful facts in all of mathematics:

> ***Every positive integer greater than 1 is either a prime number or can be written uniquely as a product of prime numbers.***

This means that prime numbers are the atoms of arithmetic. Just as every physical substance is made from combinations of chemical elements, every number is made from combinations of primes. The number $360 = 2^3 \times 3^2 \times 5$. The number $1001 = 7 \times 11 \times 13$. Every number, however large, has exactly one prime factorisation.

There Are Infinitely Many Primes — Euclid's Proof

Around 300 BCE, the Greek mathematician Euclid proved something remarkable: there is no largest prime number. The primes go on forever.

His proof is a masterpiece of simplicity, and you can understand it right now.

Suppose — just for a moment — that there are only finitely many prime numbers. Call them $p_1, p_2, p_3, \ldots, p_n$ (where p_n is the largest prime).

Now construct a new number: $N = (p_1 \times p_2 \times p_3 \times \ldots \times p_n) + 1$

What is N? It is not divisible by p_1 (because dividing gives a remainder of 1). It is not divisible by p_2 (same reason). In fact, it is not divisible by any prime on our list. So either N itself is a prime we had not listed, or N has a prime factor that was not on our list.

Either way, our assumption — that the list was complete — is false.

Therefore, there is no complete finite list of primes. The primes are infinite.

BEAUTIFUL NUMBERS: THE FIRST 50 PRIMES
2 3 5 7 11 13 17 19 23 29
31 37 41 43 47 53 59 61 67 71
73 79 83 89 97 101 103 107 109 113
127 131 137 139 149 151 157 163 167 173
179 181 191 193 197 199 211 223 227 229

The Mystery: How Are They Distributed?

So primes are infinite. But how are they spread out among the integers? Are they equally spaced? Do they thin out as numbers get larger?

The second question is easy to answer: yes, primes become less frequent as numbers get larger. Among the first 100 numbers, there are 25 primes (25%). Among numbers from 1 to 1,000, there are 168 primes (16.8%). Among numbers from 1 to 1,000,000, there are 78,498 primes (about 7.8%).

The Prime Number Theorem (proved in 1896) tells us precisely how quickly primes thin out: the number of primes up to N is approximately $N / \ln(N)$, where ln is the natural logarithm.

But exactly where any individual prime appears — that remains mysterious. Primes can appear very close together (twin primes like 11 & 13, or 41 & 43) or far apart (there is no prime between 887 and 907, a gap of 20). Whether there are infinitely many twin primes is one of the most famous unsolved problems in mathematics.

The Riemann Hypothesis: The Greatest Unsolved Problem

In 1859, the German mathematician Bernhard Riemann wrote a paper about prime numbers that changed mathematics forever. He showed that the distribution of primes is intimately connected to a mathematical function called the Riemann zeta function.

He made a conjecture — now called the Riemann Hypothesis — about where this function equals zero. If true, the hypothesis

would give mathematicians a precise and powerful understanding of how primes are distributed.

Here is the astonishing thing: the Riemann Hypothesis has never been proved. Despite being nearly 170 years old, despite the world's greatest mathematical minds working on it, despite a prize of one million US dollars offered for its proof, it remains open.

It is one of the seven Millennium Prize Problems — the seven hardest unsolved problems in mathematics. And it is about prime numbers: the simplest, most elementary objects imaginable.

> ***Prime numbers grow more lonely as you count higher — but they never disappear. Like great people, they become rarer and more remarkable as you search further.***

Primes in the Real World

If you are wondering whether all of this is merely beautiful abstraction, consider this: the security of almost every financial transaction on the internet depends on prime numbers. When you make a payment online, your credit card details are encrypted using RSA encryption — a system whose security relies entirely on the fact that it is extraordinarily difficult to factorise very large numbers back into their prime components.

A 2048-bit RSA key involves prime numbers with hundreds of digits. The most powerful computers on earth would take millions of years to crack such encryption by brute force.

The primality and irreducibility of primes — the very quality that makes them mathematically lonely — is what makes your online world secure.

Problem of the Month

Try This!

Prove that if p is a prime greater than 3, then $p^2 - 1$ is always divisible by 24. (Hint: think about what numbers you get when you write $p = 6k \pm 1$, which is the form every prime greater than 3 must take.)

Solution will appear in next issue!

1	2	3	~~4~~	5	~~6~~	7	~~8~~	~~9~~	~~10~~
11	~~12~~	13	~~14~~	~~15~~	~~16~~	17	~~18~~	19	~~20~~
~~21~~	~~22~~	23	~~24~~	~~25~~	~~26~~	~~27~~	~~28~~	29	~~30~~
31	~~32~~	~~33~~	~~34~~	~~35~~	~~36~~	37	~~38~~	~~39~~	~~40~~
41	~~42~~	43	~~44~~	~~45~~	~~46~~	47	~~48~~	~~49~~	~~50~~
~~51~~	~~52~~	53	~~54~~	~~55~~	~~56~~	~~57~~	~~58~~	59	~~60~~
61	~~62~~	~~63~~	~~64~~	~~65~~	~~66~~	67	~~68~~	~~69~~	~~70~~
71	~~72~~	73	~~74~~	~~75~~	~~76~~	~~77~~	~~78~~	79	~~80~~
~~81~~	~~82~~	83	~~84~~	~~85~~	~~86~~	~~87~~	~~88~~	89	~~90~~
~~91~~	~~92~~	~~93~~	~~94~~	~~95~~	~~96~~	97	~~98~~	~~99~~	~~100~~

The Sieve of Eratosthenes is an ancient algorithm used to find all prime numbers up to a given number. It works by repeatedly marking the multiples of each prime starting from 2. The remaining unmarked numbers are primes, making it a simple and efficient method for generating primes.

Why Every Maths Lover Must Write IOQM 2026

The Indian Olympiad Qualifier in Mathematics — your first step to the world stage

There is an examination in India that does not ask you to memorise formulas. It does not reward speed above all else. It does not care about your CBSE or ICSE marks. It asks only one thing: can you think?

That examination is the IOQM — the Indian Olympiad Qualifier in Mathematics.

And if you are a student who loves mathematics — not just the kind of mathematics that gets you marks, but the kind that makes you curious, the kind that keeps you up at night — then the IOQM is, quite simply, the most important exam you have probably never heard enough about.

What Is IOQM?

IOQM stands for the Indian Olympiad Qualifier in Mathematics. It is the first stage of the Mathematical Olympiad programme in India, which culminates in students representing India at the International Mathematical Olympiad (IMO) — the Olympics of mathematics, held every year in a different country.

The pathway works like this:

THE OLYMPIAD PATHWAY
IOQM (Stage 1) → Written by students across India in one sitting
IORS / Regional (Stage 2) → Top scorers in IOQM qualify for Regional Olympiad
INMO — Indian National Mathematical Olympiad (Stage 3) → Regional qualifiers compete nationally
IMOTC — IMO Training Camp (Stage 4) → National qualifiers receive intensive training
IMO — International Mathematical Olympiad (Stage 5) → India's best 6 students represent the country

IOQM 2026: All the Details You Need

Organiser: IOQM is conducted by the Mathematics Teachers' Association (India) — MTA(I) — in partnership with the Homi Bhabha Centre for Science Education (HBCSE), Mumbai.

Eligibility: Any Indian student studying in Class 8 to Class 12 may appear. Students who have appeared in Class 12 board examinations are not eligible. There is no minimum percentage requirement.

Exam date (2025-26 cycle): IOQM 2026 is expected to be held in January 2026. (Exact dates are announced by HBCSE and MTA — check hbcse.tifr.res.in and mtai.org.in for official announcements.)

Registration: Students register through their schools. Schools are registered with MTA(I). Individual registration without a school is generally not permitted, though some centres allow this — check with your nearest registered centre.

Duration: 3 hours

Pattern: The paper has 30 questions. Each answer is an integer between 00 and 99. There are no multiple choice options. No negative marking. Full marks for correct answer, zero for incorrect or blank.

Sections: The paper is divided into three sections — Section A (1-mark questions), Section B (2-mark questions), and Section C (5-mark questions). The total is typically 100 marks.

Syllabus: Number theory, Algebra (polynomials, equations, inequalities), Combinatorics (counting, probability), and Geometry (classical Euclidean geometry). No calculus. No trigonometry beyond basic identities.

Sample IOQM-Style Questions

QUESTION 1 (1 mark)

Find the number of positive integer solutions to the equation: $x + y + z = 15$, where $x \leq y \leq z$.

Answer: 19 | Think about: generating functions or careful case-by-case analysis based on the value of x.

QUESTION 2 (2 marks)

A positive integer N leaves a remainder of 7 when divided by 11, and a remainder of 5 when divided by 13. Find the remainder when N is divided by 143.

Answer: 83 | Think about: Chinese Remainder Theorem (or systematic substitution).

QUESTION 3 (5 marks)

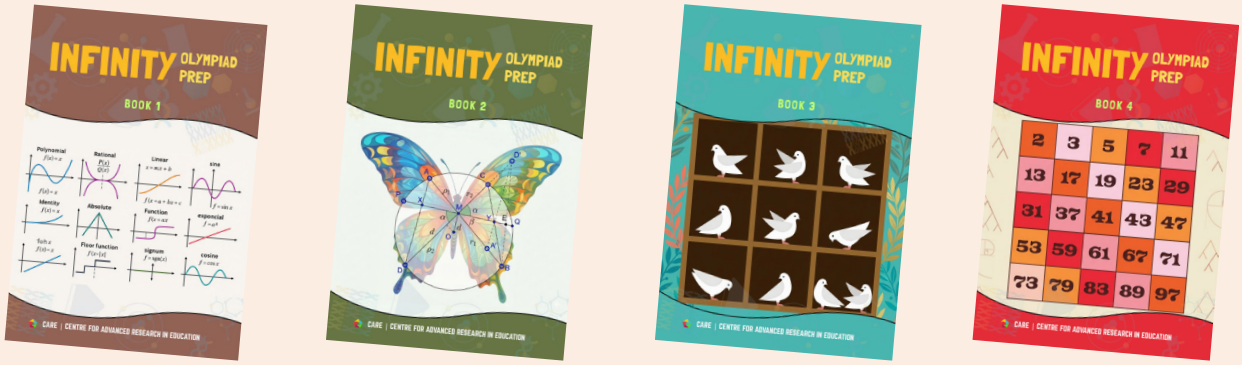
In triangle ABC, the angle bisector from A meets BC at D. If AB = 15, AC = 10, and BC = 20, find the length BD (express as a fraction and then as an integer if BD × 5 is an integer).

Hint: Use the Angle Bisector Theorem: BD/DC = AB/AC = 15/10 = 3/2. Therefore BD = (3/5) × 20 = 12.

The INFINITY Programme by CARE

CARE (careinsight.in) runs a specially designed programme called INFINITY for students preparing for the Mathematical Olympiad — from IOQM all the way to INMO.

INFINITY PROGRAMME — KEY DETAILS
Who is it for: Students in Classes 8 to 11 who are serious about Olympiad Mathematics
What it covers: Number Theory, Combinatorics, Algebra, Geometry — all four pillars of Olympiad Maths
Teaching approach: Concept-first, problem-solving focus — NOT formula-based
Level: Begins from foundational Olympiad concepts and builds to INMO level
Sessions: Live, interactive sessions with Rohith Chakrathirtha
Resources: Curated problem sets, previous IOQM & INMO papers with detailed solutions
Enrolment: Visit careinsight.in for current batch schedules and registration



Download the Infinity Brochure here: https://careinsight.in/infinity-brochure

Why Write IOQM? (Even If You Don't Qualify)

Here is something most students do not know: the IOQM is worth attempting even if you do not qualify for the next round. Here is why.

First, the preparation process itself is transformative. Students who prepare for the IOQM develop mathematical reasoning, problem-solving endurance, and creative thinking that no textbook or board exam can give them. These skills stay with you for life.

Second, IOQM performance looks excellent on any application — for college admissions, for scholarships, for research programmes. Even a creditable score (not necessarily a qualifying one) signals to institutions that you can think.

Third, the community. Olympiad mathematics connects you with the sharpest young minds in India. The friendships and intellectual partnerships formed in this ecosystem last decades.

Fourth, it is one of the few exams in India that rewards genuine mathematical beauty over rote learning. If you love mathematics — truly love it — this is your arena.

If You Love Animals and Birds: 360° Career Guide

A comprehensive guide for every student who has ever felt more at home with animals than with people

There is a student in every classroom who brings injured sparrows to school, who knows the difference between a shikra and a black kite, who reads books about ecosystems during summer holidays, and who cannot understand why anyone would choose a career that does not involve living creatures.

This article is written for that student.

The world of animal-related careers is vastly larger than most people imagine — and it is growing. From field biology to forensic wildlife science, from veterinary medicine to animal law, from nature photography to pet entrepreneurship, the options are rich, varied, and globally significant. Here is a full map of the territory.

1. The Sciences: Research and Conservation

Wildlife Biologist / Ecologist

What they do: Study animal behaviour, population dynamics, habitat requirements, and ecosystem interactions in the wild. They work in forests, marine environments, grasslands, and wetlands — often for months at a time.

How to get there: BSc in Zoology, Botany, or Life Sciences → MSc in Wildlife Science or Ecology → PhD (for research roles). The Wildlife Institute of India (WII), Dehradun, offers the premier MSc in Wildlife Science in India.

Key institutions: WII Dehradun, NCBS Bangalore, ATREE Bangalore, TERI, IISER campuses, SACON (Salim Ali Centre for Ornithology and Natural History).

Challenges: Long field hours, often remote postings, moderate starting salaries in government research. The passion for the work must be genuine.

Ornithologist (Bird Scientist)

What they do: Specifically study birds — their taxonomy, behaviour, migration, ecology, physiology, and conservation. India has over 1,300 bird species and is one of the world's most important birding destinations.

How to get there: Same science pathway as wildlife biology, with specialisation in avian ecology. The Bombay Natural History Society (BNHS) and SACON are the premier ornithological institutions in India.

The citizen science route: Many professional ornithologists began as amateur birdwatchers. eBird (the global bird recording platform run by Cornell Lab) has millions of records from Indian observers. You can begin contributing scientifically to ornithology right now, as a student.

Marine Biologist

What they do: Study ocean ecosystems, marine animals (from whales to plankton), coral reefs, and deep-sea environments.

How to get there: BSc in Marine Biology, Zoology, or Ocean Science from coastal universities. Key institutions: CMFRI (Kochi), NIO (Goa), IIT Madras (Ocean Engineering), Pondicherry University, Mangalore University.

2. Veterinary Medicine and Animal Health

Veterinarian

What they do: Diagnose, treat, and prevent illness in animals. Veterinarians work with pets (small animal practice), farm animals (large animal practice), zoo animals, or wildlife.

How to get there: BVSc & AH (Bachelor of Veterinary Science and Animal Husbandry) — a 5.5-year degree from a recognised Veterinary College. Entrance

through NEET (for most states) or state-level veterinary entrance exams. Top institutions: TANUVAS (Chennai), IVRI (Bareilly), BHU Varanasi, MAFSU (Nagpur).

Specialisations: Wildlife veterinary medicine (working with national parks and rescue centres), zoo medicine, aquatic animal health, veterinary research, public health veterinary medicine.

Animal Behaviourist

What they do: Study why animals behave the way they do — and apply this knowledge to training, welfare, conservation, and human-animal conflict resolution.

How to get there: MSc in Animal Behaviour or Psychology (with an animal focus). PhD for research roles.

3. Photography and Film: Telling Animal Stories

Wildlife Photographer

What they do: Photograph animals in their natural habitats — a pursuit that requires not just photographic skill but also deep knowledge of animal behaviour, ecology, and field craft.

How to get there: There is no formal degree requirement, but many successful wildlife photographers have a background in biology or ecology (which helps enormously in the field). Photography courses (at NID, Symbiosis, and various private institutes) can sharpen technical skills. Building a portfolio is the key credential.

The income reality: Wildlife photography is competitive. Most photographers supplement income through prints, workshops, lectures, books, and stock photography. Some become filmmakers or work with documentary companies (BBC Natural History Unit, National Geographic, WildFilms India).

Wildlife Filmmaker / Documentary Producer

What they do: Produce films about animals, ecosystems, and conservation for television, streaming platforms, and educational organisations.

How to get there: Film school (FTII Pune, SRFTI Kolkata, or mass communication programmes) combined with deep knowledge of natural history. Many start as camera assistants or sound recordists on wildlife productions.

4. Animal Husbandry and Agriculture

Animal Husbandry Specialist

What they do: Manage breeding, nutrition, health, and productivity of farm animals (cattle, poultry, sheep, goats, pigs, fish). Also advise farmers on best practices and disease management.

How to get there: BVSc & AH, or BSc in Agriculture with Animal Husbandry specialisation, or BSc in Animal Husbandry. Government jobs available through UPSC (for IAS/Forest Service), State PSCs, ICAR-affiliated research institutes.

Career in government: The Indian Forest Service (IFS) and various state veterinary departments offer significant opportunities. The Indian Council of Agricultural Research (ICAR) is one of the world's largest agricultural research organisations.

5. Entrepreneurship: The Animal Economy

Pet Care Entrepreneur

India's pet industry is growing at over 20% annually and is projected to reach $1.2 billion by 2030. Opportunities include pet grooming salons, boarding facilities, pet food businesses (especially organic and breed-specific nutrition), pet accessories design, veterinary diagnostic labs, and pet training schools.

Pedigree Breeder / Kennel Owner

What they do: Ethically breed and raise pedigree dogs (or other animals), maintaining breed standards and animal welfare.

The ethical dimension: Responsible breeding involves genetic health testing, careful temperament evaluation, and lifetime support for buyers. The Kennel Club of India (KCI) is the regulatory body. This career rewards those who combine business acumen with genuine animal welfare commitment.

Animal Trainer

What they do: Train dogs, horses, elephants (in managed facilities), birds of prey, and other animals — for service, performance, assistance (guide dogs, therapy animals), or wildlife management purposes.

How to get there: Certification programmes exist internationally (Karen Pryor Academy, CCPDT). In India, apprenticeship with established trainers remains the most common pathway. Understanding animal behaviour science (positive reinforcement methods) is essential.

6. Conservation, Law, and Policy

Wildlife Conservationist / NGO Professional

What they do: Work with organisations like WWF India, Wildlife Trust of India, Bombay Natural History Society, Nature Conservation Foundation, and others — in field conservation, advocacy, fundraising, community engagement, and policy.

How to get there: Any science background, combined with a postgraduate degree in Wildlife Science, Environmental Law, Development Studies, or Environmental Policy.

Forest Officer (Indian Forest Service)

What they do: Manage India's forests and wildlife, enforce protection laws, coordinate with local communities, and oversee national parks and wildlife sanctuaries.

How to get there: UPSC Civil Services Examination (specifically the Indian Forest Service paper requires physics, chemistry, mathematics/statistics plus forestry-related papers). This is one of the most direct and powerful career paths for someone who wants to protect wildlife at scale.

KEY INSTITUTIONS FOR ANIMAL CAREERS IN INDIA
Wildlife Institute of India (WII), Dehradun — MSc Wildlife Science, Conservation Biology
Bombay Natural History Society (BNHS), Mumbai — Research, conservation internships
SACON, Coimbatore — Salim Ali Centre for Ornithology and Natural History
NCBS, Bangalore — National Centre for Biological Sciences (research careers)
TANUVAS, Chennai — Top veterinary university
IVRI, Bareilly — Indian Veterinary Research Institute
ATREE, Bangalore — Ashoka Trust for Research in Ecology and Environment
Nature Conservation Foundation, Mysore — Field biology, snow leopard research
Kennel Club of India (KCI) — For pedigree and breeding careers

To every student who loves animals: this is not a niche interest. It is a vocation that the world urgently needs. The planet's biodiversity is under pressure as never before. The people who will protect it — the researchers, vets, photographers, filmmakers, conservationists, and entrepreneurs who dedicate their lives to other species — are among the most important people alive.

You could be one of them. Start now.

Questions & Answers with Rohith

Questions from students, teachers, and parents — answered directly and honestly

Q1. (From Aditya, Class 9, Hyderabad)

> *I love maths but I am terrible at memorising formulas. My teacher says I will never clear competitive exams. Should I give up?*

Aditya, please do not give up. More importantly: please do not believe that memorising formulas is the same thing as doing mathematics. It is not.

The mathematicians who changed the world — Euler, Gauss, Ramanujan — were not formula-memorising machines. They were people who understood deeply. Understanding means you can derive the formula when you need it, which is always better than memorising it when you do not.

Your teacher is wrong about the competitive exams part. IOQM — the Olympiad qualifier — explicitly rewards understanding over memory. And IIT JEE, while it does require knowing certain standard results, is far more about problem-solving insight than formula recall. Work on understanding why each formula is true. The memory will follow naturally.

Q2. (From Preethi, Class 7, Chennai)

> *Why do I need to learn history and social science when I want to be a scientist? It feels like a waste of time.*

Preethi, this is one of the most honest and important questions a student can ask. Let me give you an honest answer.

In the short term: you are right that history will not help you solve a physics problem next Tuesday. In the long term, you are completely wrong — and here is why.

The greatest scientists were deeply humanistic people. Darwin read enormous amounts of philosophy and history. Feynman painted and played the bongos. Subrahmanyan Chandrasekhar read Sanskrit literature. These were not coincidences. Understanding how human societies work, why wars happen, what drives people — this gives you the contextual intelligence to ask better scientific questions, to communicate your findings to the world, and to understand the ethical implications of your work. Science without history produces scientists who do not understand why their work matters. That is a very dangerous kind of scientist.

Also, practically: many of the most interesting problems at the frontiers of science today — climate change, public health, biotechnology ethics — are as much social and political problems as they are scientific ones. You will need both.

Q3. (From Rahul, Class 11, Bengaluru)

I am preparing for JEE but also interested in writing. My parents say to focus only on JEE. What do you think?

Rahul, your parents are giving you practical advice driven by genuine love. I understand that. But let me add a different perspective.

Writing is not the enemy of JEE preparation — it may actually help it. The clarity of thought required to explain a concept in writing is the same clarity of thought required to solve a problem. Many top JEE scorers keep journals, write about concepts they are learning, and find that articulation deepens understanding.

My suggestion: do not abandon writing. But be disciplined about when. One hour a week of focused writing — a journal entry, a short essay, a story — will not derail your JEE preparation. It will sustain your sanity. And in the long run, the engineer who can also write — clearly, precisely, persuasively — is far more valuable than the one who cannot.

Q4. (From Meenakshi, Class 6, Mysore)

How do birds know how to fly south in winter? Do they have GPS?

Meenakshi, they do have GPS — except it is biological and far more interesting than the one in your phone.

Birds navigate using multiple systems simultaneously. They can detect the Earth's magnetic field using magnetite crystals (a magnetic mineral) in their beaks and inner ears — this gives them a compass. They use the position of the sun during the day and the pattern of stars at night as celestial compasses. They use landmarks — coastlines, river valleys, mountain ranges. They use smells and even infrasound (very low-frequency sounds that travel enormous distances).

What is most astonishing is that this knowledge is partly instinctive (built into their genetic memory) and partly learned from their parents and flock. A young European swallow flying to South Africa for the first time has a general genetic programme that says 'fly south-southwest for a long time' — and learns to refine this from more experienced birds. Your question, incidentally, is one that ornithologists are still actively researching. The full picture is not yet complete.

Q5. (From Ms. Sharmila Rao, Elementary School Teacher, Pune)

How do I identify and nurture a genuinely gifted child in my class without making the other students feel overlooked?

This is one of the most thoughtful questions a teacher can ask, and the fact that you are asking it means you are already doing something right.

First, a caution: gifted children do not always look gifted by conventional markers. The child who finishes the exam first and gets full marks may be a high performer, not necessarily a deep thinker. The genuinely gifted child is often the one asking questions that seem strange, making unexpected connections, or getting bored precisely because they have already understood. Watch for the unusual, not just the excellent.

Second, the question of other students: gifted children do not need special praise, they need appropriate challenge. Give them harder problems. Give them open-ended projects. Ask them to explain concepts to the class (this deepens their own understanding and benefits everyone). The other students will not feel overlooked if the focus is on 'everyone gets what they need' rather than 'this child is special.'

Third: document what you observe. If you see a child with genuine mathematical or scientific talent, inform the parents, recommend olympiad programmes, and connect them with the right resources. You may be the turning point in a child's life.

Q6. (From Mr. Venkatesh Kumar, High School Science Teacher, Bengaluru)

Are competitive exams like IOQM and JEE actually measuring intelligence, or just preparation?

Venkatesh Sir, this question could fill a book — and it should. Here is a compact but honest answer.

JEE primarily measures preparation. With sufficient coaching and practice, a student of moderate natural ability can score well. This is not a criticism of JEE — it is a design choice. JEE is an engineering entrance exam, and preparation discipline is itself a predictor of engineering success.

IOQM and the Olympiads are different. The problems at the Olympiad level (INMO and above) are genuinely unsolvable by preparation alone. No amount of coaching can make you solve an IMO problem if you do not have the underlying mathematical intuition. These exams do measure something closer to mathematical intelligence — though 'intelligence' is itself a contested and complex term (see our essay in this issue).

The honest answer is that no single exam measures intelligence fully or fairly. Intelligence is multi-dimensional, contextual, and often invisible to standardised tests.

Q7. (From Mrs. Anitha Krishnamurthy, Parent, Coimbatore)

> *My daughter is in Class 9 and she wants to study literature instead of science. My husband and I are scientists. We are worried she is wasting her potential. What should we do?*

Mrs. Krishnamurthy, I understand your concern. And I am going to say something that may be uncomfortable: your daughter's potential is not being wasted by choosing literature. It is being expressed.

The fear that literature is a lesser choice than science is a cultural prejudice, not an economic or intellectual reality. The world's most impactful communicators, policymakers, educators, lawyers, journalists, and leaders have largely been people trained in language and thought — in literature, philosophy, history.

Your daughter, raised by two scientists, will almost certainly carry scientific thinking with her. She will be a literature student who understands evidence and rigour — a rare and powerful combination. She might write about science, teach it, communicate it, or do things neither you nor she can imagine yet.

My advice: ask her questions about what she loves about literature. Listen carefully. Trust that she knows something about herself that the world will eventually confirm.

Q8. (From Mr. Suresh Babu, Parent, Kochi)

> *My son is 16 and spends hours watching YouTube videos about space and quantum physics but gets average marks in school physics. Is he wasting his time?*

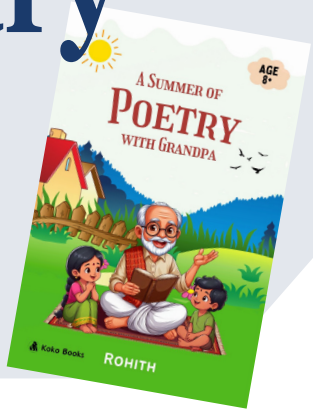
Mr. Suresh, your son is not wasting his time. He is doing something extremely important: he is falling in love.

The gap between his YouTube passion and his school marks is a gap between genuine curiosity and a curriculum that has not yet found a way to connect with that curiosity. This is a common tragedy and an entirely solvable problem.

What he needs is a bridge: a teacher, a book, a programme that shows him how the school physics he is studying connects to the quantum mechanics he finds fascinating. The equations of quantum physics begin with the same classical mechanics he is learning in Class 11. Every concept he loves on YouTube has roots in what his textbook is (poorly) trying to teach him.

My practical suggestion: encourage him to start a YouTube channel or a blog where he explains the concepts he is watching. The act of teaching something — even to an imaginary audience — forces genuine understanding, and genuine understanding fixes school marks. Also, point him towards the KVPY scholarship exam, which was specifically designed for students exactly like your son.

A Summer of Poetry with Grandpa



By Rohith Chakrathirtha | Koko Books

Reviewed by Nandini Krishnan, Age 13, Class 8, Bengaluru

I will be completely honest: before I read this book, I thought poetry was boring. It was the kind of thing teachers made us memorise and then recite in flat, monotone voices while everyone stared at the ceiling.

A Summer of Poetry with Grandpa changed that.

The book follows Ravi and Meera — two cousins, one slightly more enthusiastic about books than the other (that would be Meera) — who spend fifteen days of their summer holidays with their grandfather. Grandpa is not the kind of grandfather who sits in a chair watching television. He is the kind who wakes up before sunrise, has strong opinions about everything from the Romantics to rainfall, and believes that a child who has not read a poem properly has missed something essential about being alive.

> ***Grandpa made me understand that a poem is not something you read once and file away. It is something you live with, argue with, return to.***

Each day of the holiday, Grandpa introduces Ravi and Meera to one poem. Not by making them read it silently and answer comprehension questions, but by reading it aloud himself, discussing the words, sometimes arguing about what they mean, and then relating the poem to something in their actual lives.

What makes this book special is that it is really teaching you while pretending to be a story. By the time you finish fifteen days with Grandpa, you have understood simile, metaphor, alliteration, personification, onomatopoeia, and several other figures of speech — not because someone defined them, but because you have seen them working in real poems, heard them discussed, and felt why they matter.

The poems chosen are genuinely beautiful and varied. There is Keats and Shelley, but also poems in translation, and folk verses. The variety means that both Ravi (who is reluctant about poetry at the start) and Meera (who is more open) find things that speak to them.

The characters are warm but not saccharine. Ravi argues with Grandpa, which is realistic and also quite funny. Meera asks questions that sometimes Grandpa cannot fully answer, which teaches you that good literature does not always have neat explanations.

I would recommend this book for anyone from about age 10 upwards. If you are a reluctant reader of poetry — and most of us are — this is the gentlest and most intelligent way into a world that I now realise I had been missing. And if you are already a lover of poetry, you will find new poems to love and a grandfather you wish were your own.

Rating: ★★★★★

Available on Amazon India and at careinsight.in

What Is Intelligence?

An honest, uncomfortable, and hopeful essay on a word we use too casually

We use the word 'intelligent' every day. We say: 'She is so intelligent' or 'He is not very intelligent.' We rank students by marks and call the ones at the top intelligent. We build entire educational systems around this ranking. We make decisions about children's futures based on this word.

And yet, if you stop and ask — what exactly is intelligence? — most people go very quiet.

This essay is my attempt to answer that question. Or rather, to demonstrate why the question is much harder, and much more important, than most of us have been led to believe.

What Intelligence Is Not

Let us begin by clearing some ground.

Intelligence is not literacy. Literacy — the ability to read and write — is a skill, and an extremely important one. But it is not the same thing as intelligence. A person who has never been taught to read may be extraordinarily intelligent; a person who reads fluently may be deeply unimaginative.

Intelligence is not schooling. Years of formal education correlate with certain measurable outcomes, but they do not produce intelligence — at best, they can nurture what was already there. History is full of people who received little or no formal education and changed the world through sheer force of mind: Srinivasa Ramanujan, who was largely self-taught; Lincoln, who had less than a year of formal schooling; Faraday, who had no university education at all.

Intelligence is not marks or grades. Marks measure performance on a specific, constrained task under specific conditions. They measure preparation, recall, and test-taking ability. These are genuine skills. But they are not the same as intelligence. The student who scores 95 in chemistry may be unable to think creatively about a new problem she has never seen. The student who scores 60 may be in the middle of developing an entirely original way of seeing the world.

> ***If the only tool you use to measure intelligence is a standardised examination, you will spend your life finding only what examinations can find — which is not very much.***

What Intelligence Might Be

So what is it?

Howard Gardner, the Harvard psychologist, proposed in 1983 that intelligence is not a single capacity but a set of

distinct intelligences: linguistic, logical-mathematical, spatial, musical, bodily-kinaesthetic, interpersonal (understanding others), intrapersonal (understanding oneself), naturalist (understanding the natural world), and possibly existential (grappling with deep questions of existence).

Our education systems — across most of the world — primarily assess the first two: linguistic and logical-mathematical. Everything else is treated as extra-curricular, supplementary, or not measurable at all.

This means that the student with extraordinary interpersonal intelligence — who can read a room, mediate a conflict, inspire a group — is invisible to the system. The student with musical intelligence that borders on genius gets no marks for it. The student who understands ecosystems at a level that would astonish professional ecologists gets no credit in Class 10.

We are assessing roughly two of nine possible intelligences and calling the result a ranking of human potential.

Intelligence Is Inbuilt — But Not Fixed

There is something called fluid intelligence — the ability to reason, see patterns, and solve novel problems — which appears to be largely inborn and relatively stable. And there is crystallised intelligence — the accumulated knowledge, skills, and frameworks you develop through experience and learning — which grows throughout life.

This distinction is important for two reasons. First, it means that some aspects of intelligence are genuinely natural — not the result of privilege or coaching. Second, it means that the aspects of intelligence most amenable to development are precisely the ones most neglected by our educational system: the cultivation of knowledge, frameworks, and ways of seeing.

The tragedy is that many children who have high fluid intelligence — a natural capacity for complex thinking — are dismissed by systems that only reward crystallised performance on narrow tasks. And many children who score well on examinations have done so through intensive coaching that develops crystallised knowledge without ever touching their underlying capacity to think.

The Failure of the Mark-Rank System

Our mark and rank system was designed in the 19th century, largely to serve the needs of industrial economies that required workers who could follow instructions reliably and uniformly. The system was not designed to identify creative thinkers, moral visionaries, original scientists, or empathic leaders.

And it shows.

The examination system rewards convergent thinking — producing the one correct answer — and systematically discourages divergent thinking — generating multiple possible approaches, questioning the problem itself, or noticing that the question is wrongly framed. Real intelligence, in its highest forms, is almost entirely divergent.

Albert Einstein was told by a teacher that he 'would never amount to much.' Charles Darwin was considered an undistinguished student. Richard Feynman — who would go on to win the Nobel Prize in Physics — was rejected by the mathematics department at Columbia University. Thomas Edison was told by his teacher that he was 'too stupid to learn anything.' The list of people dismissed by educational systems who went on to transform civilisation is very long.

This does not mean that educational systems are useless. It means that they measure a narrow slice of human potential and should not be mistaken for a measure of human worth or human intelligence.

What Would Genuine Intelligence Assessment Look Like?

A genuinely intelligent assessment of a student would involve: observing how they approach a problem they have never seen before; asking them to explain something to someone who does not understand it; giving them an open-ended challenge with no single correct answer; observing how they collaborate with others; watching how they respond to failure; asking them what questions they are burning to answer.

None of these fit neatly into a three-hour examination paper. And that is precisely the point.

Some countries — Finland, most notably — have built educational systems that come closer to this ideal, with less standardised testing, more project-based learning, and a genuine belief that every student has something worth developing. The results are striking.

The purpose of this essay is not to make you dismiss your examinations — you still need to clear them, and doing so matters for your immediate future. The purpose is to ask you to hold two things simultaneously in your mind.

First: do your examinations well, because they open doors.

Second: do not confuse your marks with your intelligence. They are not the same thing. They have never been the same thing. And the most intelligent people in history rarely received the marks to prove it.

Your intelligence is yours. The examination is just a door.

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Six puzzles — from warm-up to challenging. Send your solutions to careinsight.in

Puzzle 1: The Lateral Thinking Classic (Warm-Up)

A man walks into a restaurant and orders albatross soup. After one sip, he goes home and shoots himself. Why?

Think before you scroll to the answer. The clue is in what he discovers about himself.

Puzzle 2: The Logic Grid (Medium)

Three students — Arun, Bina, and Chetan — take three different subjects: Mathematics, Physics, and Chemistry. We know: (1) Arun does not take Physics. (2) Bina does not take Chemistry. (3) The person who takes Mathematics sits next to Arun. (4) Bina sits next to the person who takes Chemistry. Who takes which subject?

Puzzle 3: Mathematical Puzzle (Medium-Hard)

Find all positive integers n such that $n^2 + 3n + 5$ is a perfect square.

Hint: Write $n^2 + 3n + 5 = k^2$ and explore what values of k are possible relative to n.

Puzzle 4: Word Puzzle — The Hidden Connection

What single word can precede all of the following words to make a new compound word or phrase? ____ LIGHT, ____ FALL, ____ STORM, ____ BOW, ____ COAT

Puzzle 5: Visual-Spatial Puzzle (Hard)

A 3×3 grid of squares is cut from a single piece of paper. What is the minimum number of straight cuts needed to separate all 9 squares? (Each cut must go from one edge of the paper to the other — no folding allowed.)

Puzzle 6: The Cipher Challenge (Send Your Answer!)

Decode this message: GURER VF AB EBLNY EBNQ GB ZNGURZNGVPF

This is a substitution cipher. Hint: Each letter has been shifted by a fixed amount. The message, when decoded, is a famous quote about mathematics.

Send your decoded answer and your method to careinsightexams@gmail.com — correct answers will be featured in the next issue!

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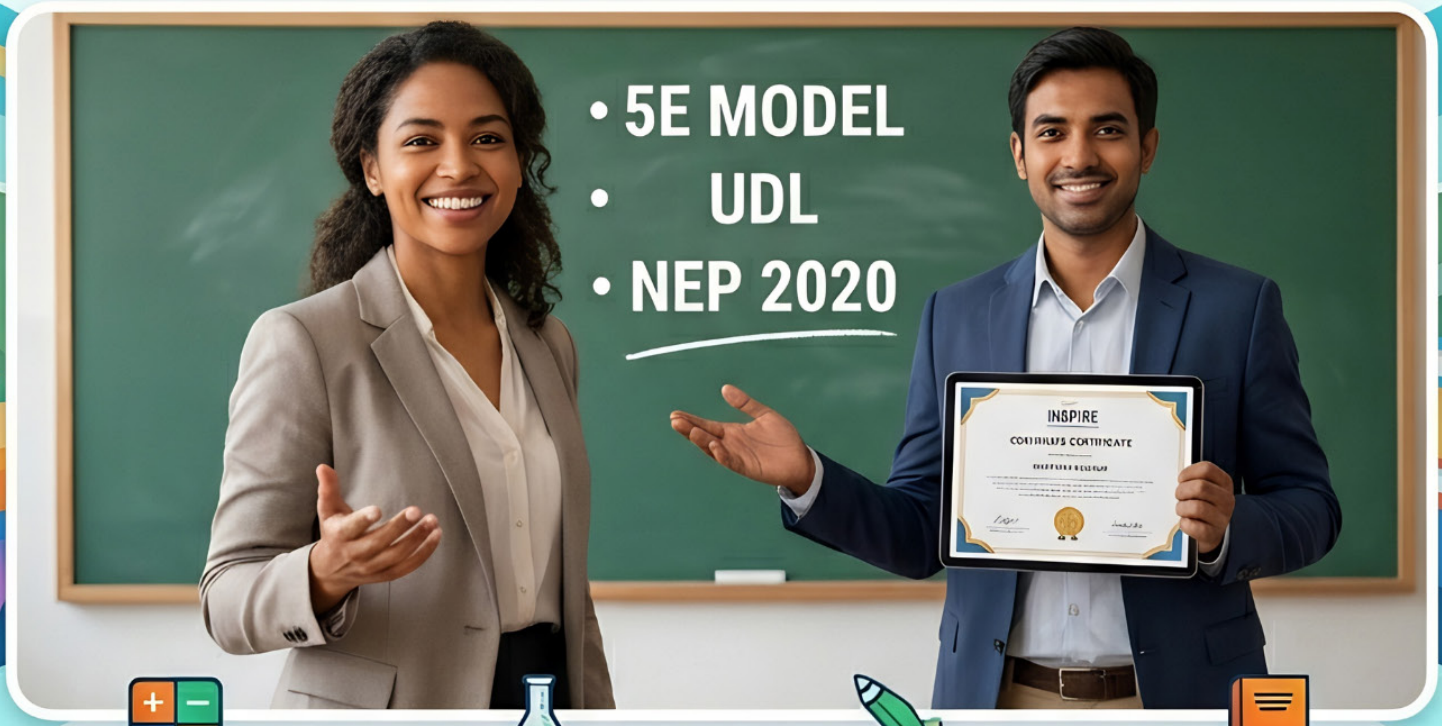

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