DEMYSTIFYING COMPUTATIONAL THINKING

Why, What & How — for CBSE Classes 3–8

For CBSE Teachers

Speaker- Rohit Bishnoi

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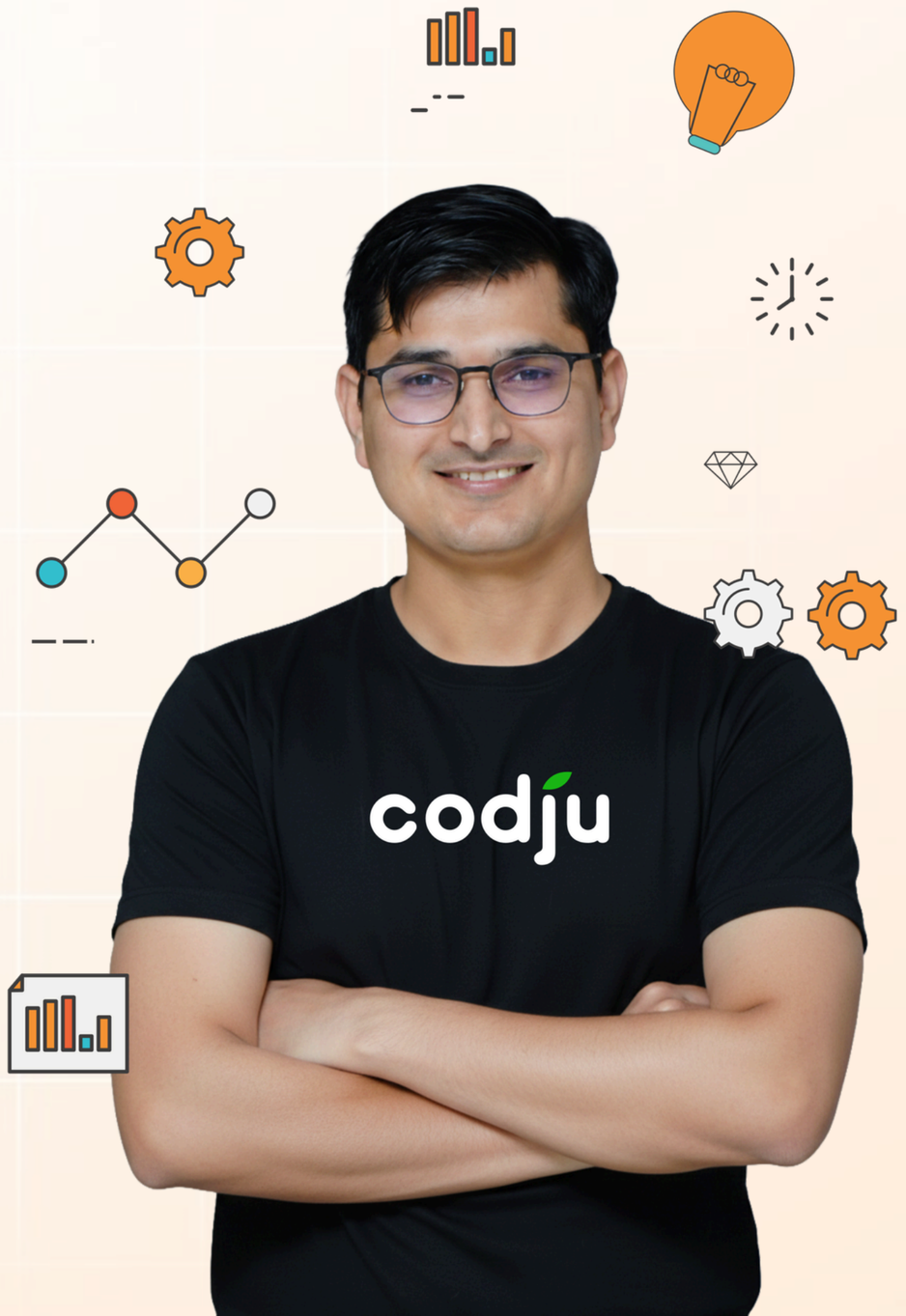
Rohit Bishnoi

Founder, Codju

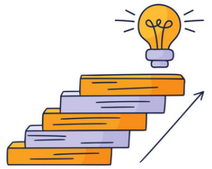
IIT Kanpur | IIMK



What is Computational Thinking?

DEFINITION

A way of **solving problems**— by breaking them down, spotting patterns, focusing on what matters, and finding step-by-step solutions.



"You already do this. Every single day."

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My interview experience

Campus placements (Dec 2007, IIT Kanpur)

What is the total number of professional swimming pools in Rajasthan?

Transocean

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The Problem We Need to Talk About

We are preparing students for jobs that don't exist yet.

65% of children entering primary school today will work in jobs that haven't been invented.

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The Problem We Need to Talk About

Key Statistics for CBSE Class 10th Result 2026:

- **Students above 90%:** 2,21,574 (approx. 8.96% of students).
- **Students above 95%:** 55,368 (approx. 2.24% of students).
- **Total Appeared:** Over 24.71 lakh students.

Are we teaching them to think — or just to answer?

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Why Now?

CBSE didn't do this because it's trendy.

Global Shift

Finland, Singapore, UK made CT compulsory years ago. India is catching up.

AI Economy

By 2030, 85 million jobs will be transformed by AI. New roles demand new thinking skills.

NEP 2020

The National Education Policy explicitly calls for computational thinking across all subjects.

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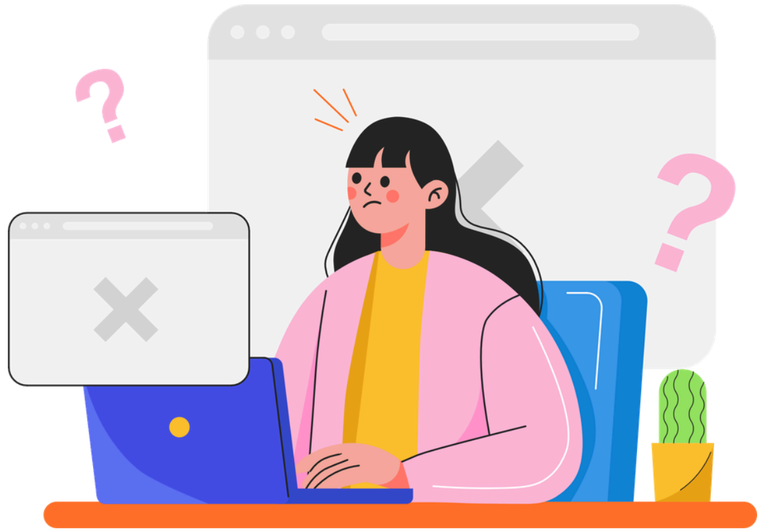
The Simple Truth

Computational Thinking has nothing to do with computers.



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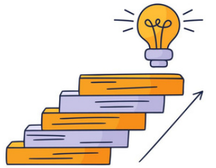

"You already do this. Every single day."

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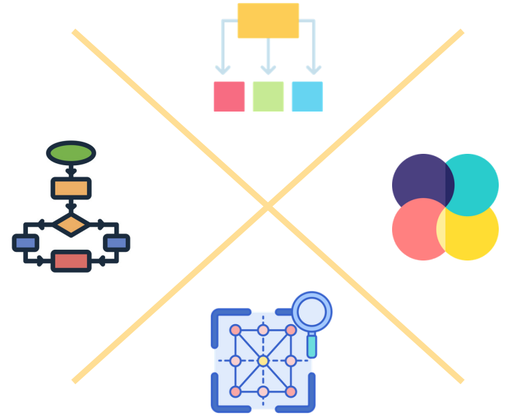
The 4 Pillars of CT

Four superpowers. One framework.



DECOMPOSITION

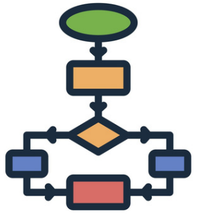
Break big problems into small, manageable pieces

PATTERN RECOGNITION

Find similarities and connections

ABSTRACTION

Focus on what matters; ignore the rest



ALGORITHM

Create a clear, step-by-step solution

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The 4 Pillars of CT

DECOMPOSITION

Break big problems into small, manageable pieces

Elon Musk & SpaceX — First Principles Thinking

When everyone said rockets cost $65 million, Musk asked:
"What is a rocket actually made of?"

Aerospace-grade aluminium: **cheap**
Titanium, copper, carbon fibre: **cheap**
Assembly + profit margins: that's where the cost is

He decomposed the problem of "**expensive rockets**" into **raw material costs vs. manufacturing costs.**

Result: SpaceX builds rockets for 10x less than competitors.

CT lesson: Don't accept the problem at face value. Decompose it to its components.

The 4 Pillars of CT

PATTERN RECOGNITION

Find similarities and connections

Warren Buffett — The World's Greatest Pattern Recognizer

Buffett has said:
"I don't predict the future. I recognize patterns from the past."

His investment strategy:

- Companies with consistent earnings growth → pattern of reliability
- Brands people return to repeatedly → pattern of loyalty
- Low debt over decades → pattern of discipline

He bought Coca-Cola in 1988 because he recognized a pattern: people drink it in good times AND bad. He recognized the same pattern in Apple 30 years later.

CT lesson: Patterns transcend industry. The same pattern in different domains = powerful insight.

The 4 Pillars of CT

ABSTRACTION

Focus on what matters; ignore the rest

UPI / PhonePe / GPay — Abstraction of Banking

Before UPI, transferring money required:

- IFSC code, account number, bank name, branch, waiting 2 days

- UPI abstracted all of that into: one phone number or QR code.

The complexity still exists — it's just hidden. That hiding of complexity is abstraction. NPCI processes 14 billion transactions per month on this abstraction.

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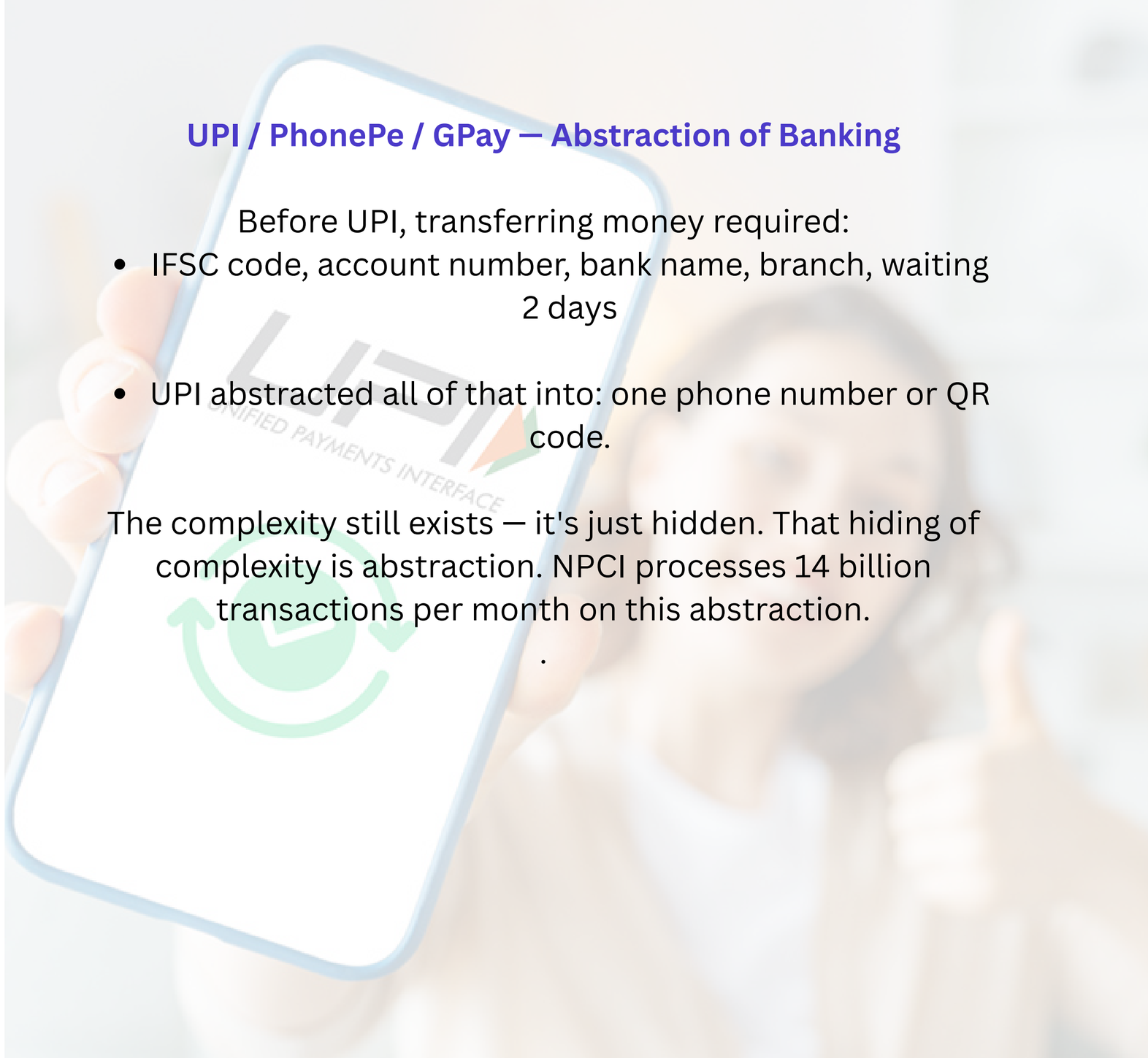
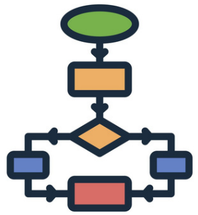


The 4 Pillars of CT



ALGORITHM

Create a clear, step-by-step solution

Amazon Prime — An Algorithm Running Your Shopping

When you click "Buy Now," an algorithm:

- Checks inventory across 175 fulfilment centres
- Finds the closest warehouse with stock
- Calculates fastest delivery route
- Assigns a delivery partner
- Sends you a tracking number
- Updates estimated time every 10 minutes

All of this in under 2 seconds. Pure algorithmic thinking, built by humans, executed by machines.

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Live Activity 2 minutes

Making Tea = Computational Thinking

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Live Activity 2 minutes

Making Tea
= Computational Thinking

DECOMPOSITION

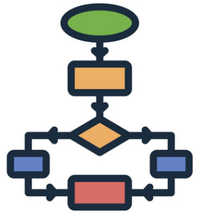
List every step: boil water → add tea → add milk → add sugar

PATTERN RECOGNITION

You know from experience: 1/2 spoons of tea per cup

ABSTRACTION

You don't think about the chemistry of boiling water



ALGORITHM

You follow the same sequence every single time

You are already a Computational Thinker!

Computational Thinking is Everywhere

It's not a tech skill.

life skill.

CRICKET CAPTAIN

Analyses the opposition (pattern), plans batting order (algorithm)

DOCTOR

Breaks down symptoms (decompose), identifies disease pattern (abstraction)

YOUR STUDENTS

Sort Lego bricks, plan fastest route to school, organise a trip

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Classes 3–5

Foundation Phase

Build the thinking muscles first

- **Sorting & classifying objects and ideas**
- **Sequencing stories and instructions**
- **Spotting patterns in numbers and shapes**
- **Simple if–then reasoning ("If it rains, then...")**

KEY PRINCIPLE

“No screens required Make thinking visible.”

Children at this age learn through play and tangible activities. CT is unplugged first.

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Classes 3–5

No computers needed. Just great questions.

Class 3

PLAN A BIRTHDAY PARTY

Sequencing (algorithm) + listing what matters (abstraction)

Class 4

SORT ANIMALS BY CHARACTERISTICS

Classification (pattern recognition) + grouping (decomposition)

Class 5

FIND THE PATTERN: 2, 4, 8, 16...

Pattern recognition → predict next number → explain the rule

Any Grade

GIVE DIRECTIONS FROM CLASSROOM TO OFFICE

Classification (pattern recognition) + grouping (decomposition)

Classes 6–8 Application Phase

From playing with ideas to applying them.

- Think about EFFICIENCY — not just correctness
- Understand data and what it tells us
- Build and debug simple step-by-step processes
- Analyse systems and how they work together

THE KEY QUESTION SHIFTS:

"Does it work?" →

"Is this the BEST way?"

NEW IN 6–8:

Introduction to AI, data literacy, and computational models

Demystifying AI

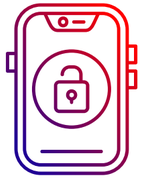
AI is not magic. It learns from examples — just like your students.

NETFLIX SUGGESTS A SHOW

Data → Patterns → Decision

GOOGLE MAPS FINDS A ROUTE

Data → Patterns → Decision



PHONE UNLOCKS YOUR FACE

Data → Patterns → Decision

Sound familiar? That's CT. AI is CT at scale.

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CT is not a subject.
It is a lens.

Put on the CT lens, and your Maths lesson becomes a problem-solving workshop. Your English lesson becomes a logic exercise.

Nothing needs to be thrown out — everything needs to be **seen differently.**

CT in Maths

The CT was already there. Now name it.

Decompose

Break word problems into smaller, solvable steps

Pattern

LCM, HCF, sequences — all about finding the rule

Algorithm

Geometry proofs follow a precise, logical sequence

Abstraction

Variables in algebra: ignore the noise, solve for x

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CT in Science

The CT was already there. Now name it.

Decompose

Break down a food chain into individual cause-effect links

Pattern

Classify living things by shared characteristics

Algorithm

Design an experiment — every step must be precise and repeatable

Abstraction

Form a hypothesis — ignore irrelevant variables, focus on one

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CT in English

The CT was already there.
Now name it.

Decompose

Plan an essay: introduction → argument → conclusion (step by step)

Pattern

Identify recurring trends, themes, or structures across different texts.

Algorithm

Grammar rules are precise, repeatable logical instructions

Abstraction

Filter out specific details to focus only on the core message or "skeleton."

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CT in Social Science

The CT was already there.
Now name it.

Decompose

Break down government structure into its individual systems

Pattern

Compare two historical events to find recurring causes and effects

Algorithm

Trace cause → effect → result in geography (e.g. deforestation)

Abstraction

Map a social problem to its core issue, ignoring surface noise

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Demystifying AI

4 questions. Every subject.

1. What PROBLEM am I asking students to solve — not just understand?
2. Can students BREAK IT DOWN into smaller, solvable parts?
3. Is there a PATTERN to spot or a rule to discover?
4. Can students build a STEP-BY-STEP path to the answer?

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The Mindset Shift

Old classroom vs. New classroom.

OLD MODEL

- I teach → You absorb
- Right answer = success
- Thinking is invisible
- One method for all
- Memory rewarded

NEW MODEL

- I pose → You think
- Process = success
- Thinking is made visible
- Multiple paths welcomed
- Reasoning rewarded

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Action Step

Start tomorrow.
With one lesson.

▶ YOU CHALLENGE

In your next class, instead of giving students the answer — give them a messy problem.

Ask: "How would you even START solving this?"

Watch what happens.

No new curriculum needed. No computer lab required. Just a better question.

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Rethinking Assessment

Don't just ask "What is the answer?"

PROCESS JOURNALS

Students document HOW they thought through a problem

PEER EXPLANATION

"Teach your neighbour" — if you can explain it, you understand it

PORTFOLIO EVIDENCE

Collect thinking artifacts over time — not just test scores

CBSE supports this shift — give credit for thinking, not just results.

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10 YEARS FROM NOW

Your students will work with tools we haven't invented yet.

The only skill guaranteed to matter?
The ability to **think clearly, break problems down,** and **adapt.**

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We train teachers.
We inspire students.
We build futures.

220+	School Partners
125K+	Students Enrolled
Grade 1–10	Curriculum Coverage

- 220+ school partners across India
- 125,000+ students in our programmes
- Founded by IIT Kanpur & Microsoft alumni
- Specialised in CT + AI education

Delhi Public School | St. Soldiers School Panchkula | Bharan Vidyalaya, Panchkula | St. John's High School Chandigarh | MBS International School | Silver Oaks School | The Hyderabad Public School Begumpet | Ambience Public School | Indus Group of schools

Sri Venkateshwar International School | The Aryan School | ZGS ZAD Global School | Yadavindra Public School, Patiala | Saint Soldier International School | MGN Public School | Mukand | Budha Dal Public School, Patiala | Estd. 2017

YOUR TURN

Think of one lesson you're teaching next week.

Where is the thinking moment in that lesson?
Where could you hand the problem to the student and say — YOU figure it out?

Share your answer in the chat. We'd love to read it.

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CT is not about computers. It's about courage to think.

You already have everything you need to start. Your students are waiting for a teacher who believes in their thinking.