Grade 4

FathomKey

AI Series

AI for YOUNG MINDS

Future - Ready kids

Think Smart Build Better

Fun, Friendly Introduction to AI

NEP 2020 • NCF-SE 2023 • CT & AI Competency Aligned

Young Problem Solver

I solve problems step by step.

Technology Explorer

I explore technology and use it wisely

Responsible Digital Citizen

I use technology safely and kindly

Authored by alumni of IIM Bangalore and University of Texas

FathomKey

AI for Young Mind – Grade 4
First Edition: 2026

Published by: Fathomkey
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ISBN: 978-81-180798-1-1
Printed in India by:

Curriculum Alignment
This book is part of a grade-wise AI learning programme developed for Indian schools. Its content is informed by the principles of **NEP 2020, NCF** and relevant **CTAI** guidance. It supports the development of computational thinking, problem-solving, digital literacy, creativity and responsible use of Artificial Intelligence across school curricula.

LMS Support
This book is supported by the FATHOMKEY Learning Management System (LMS), which provides digital learning resources, interactive activities, assessments and additional support for students and teachers. LMS access is available through registered schools. For access and assistance, visit https://lms.fathomkey.in or contact info@fathomkey.in.

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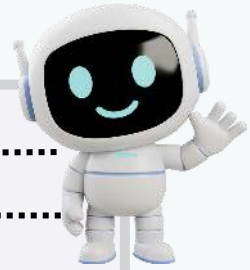
FATHOMKEY
AI for everyone.

AI for YOUNG MINDS

Grade 4

Fun, Friendly Introduction to AI



Name: .....

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Subject: ..... Roll No: .....

School: .....

CT & AI STUDENT BOOK

FathomKey

Authored by alumni of IIM Bangalore and University of Texas

PREFACE

Artificial Intelligence is becoming part of the world in which children learn, communicate and solve problems. **AI for Young Minds – Grade 4** helps students explore this technology through age-appropriate concepts, familiar situations and meaningful activities.

Building on their earlier learning, students develop important Computational Thinking skills such as observation, decomposition, pattern recognition, sequencing and algorithmic thinking. They explore shapes, mirror images, visual information, repeating and growing patterns, clear instructions, algorithms and simple flowcharts. These concepts provide a strong foundation for understanding how computers and AI systems process information and perform tasks.

The book also introduces students to AI assistants and examines how AI may support people at home, at school and in hospitals. Students learn that AI can explain ideas organise information and offer suggestions, but it may also produce incorrect or incomplete answers. Therefore, human judgement, verification and final decision-making remain essential.

Online safety and responsible AI use are important parts of the book. Students are guided to protect personal information, follow the instructions of teachers and parents, check important facts, respect school rules and express learning in their own words rather than copying AI-generated answers.

Each chapter includes real-life connections, quick checks, revision sections, activities and guided AI Lab tasks. The final project encourages students to identify a genuine problem, plan a safe and useful AI idea, consider the people who may use it and explain how a human will check the result.

We hope this book encourages students to question thoughtfully, create confidently and use technology safely, honestly and responsibly.

Think Smart. Create Responsibly. Let People Lead.

Inside the Series

🎯 What You Will Learn
The section tells you what you will learn in the chapter and the skills you will develop.

🎨 Activity Corner
Enjoy hands-on activities, drawing, puzzles and mini projects to reinforce your learning.

🤖 Byte's Smart Tip
Byte shares smart tips to help you to solve problems using Computational Thinking.

📖 Let's Begin with Introduction
Every chapter begins with an interesting introduction that helps you to solve everyday life.

🌍 Real-Life Connection
Discover how Computational Thinking helps us to solve problems in our daily lives.

📘 Definition
Learn important words and their meanings in simple and easy language.

💻 AI Connection
Explore how Artificial Intelligence and smart machines use instructions to complete tasks.

⭐ Did You Know?
Read amazing facts that make learning more interesting and fun.

🧠 Think About It
Answer thought-provoking questions that encourage observation, reasoning and discussion.

🏆 Challenge Yourself
Apply your learning through HOTS, analytical thinking and real-life problem-solving activities.

📝 Exercise Time
Practice what you have learned through fun and engaging questions.

📚 Let's Revise
Quickly revise the chapter using a summary, glossary and a simple mind map.

CONTENTS

UNIT 1 Thinking Like an AI

Chapter 1

Think like a problem solver

🎯 Learning Outcomes

After completing this chapter, you will be able to:

✅ Understand what a problem is and why problems need solutions.

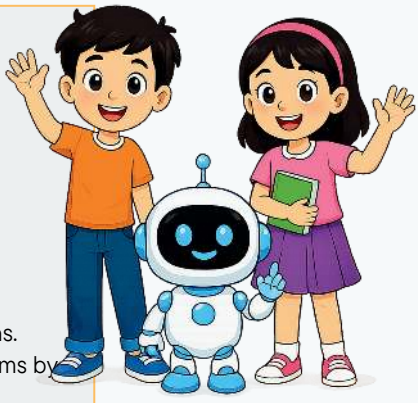
✅ Explain how planning helps us to solve problems more effectively.

✅ Break a big problem into smaller, manageable tasks (Decomposition).

✅ Use logical thinking to solve everyday problems.

✅ Recognise that one problem can have different solutions.

✅ Understand how Artificial Intelligence (AI) solves problems by following clear instructions



Chapter Introduction

Every day is full of exciting challenges. Some are easy, while others make us think.

- Have you ever searched for a missing notebook before school?
- Have you ever tried to organize your study table?
- Have you ever wondered how to finish your homework before going out to play?

These are all problems and every problem has a solution. Good problem solvers do not panic when they face a challenge. Instead, they stay calm, observe carefully, think logically and solve one part of the problem at a time.

Computers and Artificial Intelligence (AI) work in a similar way. They do not guess or feel confused. They solve problems by following clear instructions and carefully planned steps.

Learning to think like a problem solver helps us at home, at school, while playing games and even when using AI tools. The better we become at solving problems, the better decisions we can make in everyday life.

In this chapter, you will discover how smart thinking, careful planning and logical steps can help you solve problems just like an AI system.

> **"Every difficult problem becomes easier when we solve it one small step at a time."**

How Does AI Solve Problems?

Have you ever asked an AI assistant a question?For example:
"Which is the tallest mountain in the world?" Or
"Help me write a poem."
The AI answers in only a few seconds.
It may look like magic—but it isn't!
Inside the computer, the AI follows many small steps.
It first understands your question.
Then it searches for useful information.
Next, it thinks about the best answer.
Finally, it creates a response that is easy to understand.
AI does not suddenly know everything.
It solves one small part of the problem after another, just like good students do.
This way of solving problems step by step is called Computational Thinking.
When we learn Computational Thinking, we begin to think like an AI problem solver.

Let's Observe

Imagine your teacher asks,
"Plan a class picnic."
Would you immediately start packing your bag?
Of course not!
First, you would think about:

Byte's Smart Tip

Small Steps Lead to Big Success
Whenever a problem looks difficult, don't try to solve everything together.

Where are we going?
How will we travel?
What food should we carry?
What games shall we play?

Without realizing it, you are already solving the problem step by step.
That is exactly how AI works.

Every Problem Has a Solution

Look around you.
Your home...Your classroom...Your playground...
Everywhere people solve problems.
Sometimes the problems are very small.
Sometimes they are quite big.
For example:

- Your shoelace comes undone.
- You forget your lunch box.
- Your bicycle tyre has no air.

These are everyday problems. Instead of becoming worried, we should ask ourselves, "What can I do to solve this?"
Good problem solvers never give up easily. They look for different ideas, compare different solutions and choose the best one.

Problem: A problem is a situation or challenge that needs a solution.

Example:
Your water bottle is missing before school starts. Finding it is the problem.

Solution: A solution is a way to solve a problem.

Example:
You carefully check your classroom, your school bag and the playground until you find your bottle. That is your solution.

Remember: A problem is not something to fear. It is simply something waiting to be solved.

One Problem Can Have Many Solutions

Imagine your pencil breaks during class. Can you solve the problem? **Yes!**
You could:

- sharpen it,
- borrow another pencil,
- use a spare pencil,
- or ask your teacher for help.

All these are different solutions to the same problem.
Sometimes one solution is faster.
Sometimes another solution is better.
Good thinkers compare different ideas before choosing the best one.
AI systems also compare many possible answers before giving a response.

Example: Before cleaning your room, you decide: Pick up the toys, arrange the books, fold the clothes, sweep the floor.

AI Connection

Imagine you are designing an AI robot that helps students in the library.
What should the robot do first?
Tick the correct answer.
□ Arrange the books randomly.
□ Ask which book the student wants.
□ Close the library.
□ Switch off the lights.

Thinking Skills HOTS!!

Imagine you are designing an AI robot that helps students in the library.
What should the robot do first?

Planning: It means thinking about the steps before starting a task.
Good planning helps us save time, avoid mistakes and complete our work successfully.

Did You Know?

The Mars rovers sent by scientists to explore Mars cannot solve everything at once.
Even space robots solve one small problem at a time!

Planning

Planning means thinking about the steps before starting a task.

Good planning helps us to save time, avoid mistakes and complete our work successfully.

Example:

Before cleaning your room, you decide:

>Pick up the toys.

>Arrange the books.

>Fold the clothes.

>Sweep the floor.

This simple plan makes the work much easier.

Real-Life Example

Packing Your School Bag

Suppose tomorrow you have Mathematics, English, Science and Art.

If you simply throw books into your bag without checking your timetable, you might forget something important. Instead, a smart student:

✅ checks the timetable,
✅ collects the correct books,
✅ packs the notebooks,
✅ keeps the pencil box,
✅ fills the water bottle,
✅ checks everything once again.

Planning makes the task easy and helps us to avoid mistakes. Good planning is one of the most important habits of successful students—and of successful AI systems too.

Why Is Planning Important?

Think about making a birthday cake. Would you mix everything together without reading the recipe?

Probably not!!!

A good baker follows a plan.

A doctor follows a treatment plan.

An architect follows a building plan.

Even astronauts follow detailed plans before travelling into space.

Planning helps us to:

- know what to do
- avoid confusion
- save time
- make fewer mistakes
- finish work more confidently.

Artificial Intelligence also depends on careful planning.

Before an AI system can answer questions, recognise faces or recommend videos, people first design and plan how it should work.

📝 **Quick Check**

Fill in the blanks.

1. A big problem becomes easier when we break it into _____ parts.
2. _____ means dividing a large problem into smaller tasks.

Breaking Big Problems into Smaller Parts

Have you ever looked at a huge task and thought,

"This is too difficult!"

Many people feel this way when they see a big problem. The good news is that *every big problem becomes easier when we divide it into smaller tasks*. This important thinking skill is called **Decomposition.** Instead of trying to solve everything at once, we solve **one small part,** then another, until the whole problem is solved. Think of building a LEGO model. You do not build the whole model in one step.

- You connect one brick...
- then another...
- and another...

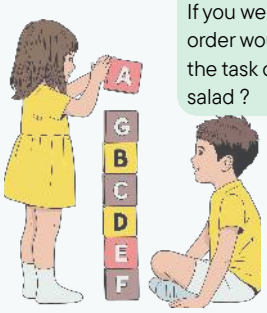
Decomposition: It means breaking a big problem into smaller, easier parts that can be solved one at a time.

Soon, the entire model is complete.Problem solving works in exactly the same way.

Example

Big Problem: Prepare for the school science exhibition.

Small Tasks: Choose a topic, Collect information, Build the model, practice explaining it. Each small task is easy to complete and together they solve the bigger problem.



Analytical Thinking

If you were Riya, in what order would you complete the task of making a fruit salad ?

Planning Makes Problem Solving Easier

Imagine your class is organizing a Tree Plantation Day. Can one student do everything?

No!

Different students can work on different tasks.

- One group collects saplings.
- Another group brings watering cans.
- Another group digs small holes.
- Another group writes plant labels.
- Another group waters the plants.

When everyone finishes their part, the entire event becomes successful. Large projects become easier when work is divided into smaller jobs. This idea is used every where. Doctors, Scientists, Engineers, Teachers. Software developers. Even astronauts. Everyone breaks large tasks into smaller ones.

How AI Uses Decomposition

Artificial Intelligence also divides difficult work into many smaller tasks. For example, imagine you upload a photograph to an AI application. The AI does not immediately say, "This is a x ray of human skeleton."

Instead, it performs many tiny jobs.
It may first:

- detect the object,
- study its shape,
- recognise the length,
- compare the size,
- examine the location
- compare thousands of pictures,
- then make a decision.

All this happens in just a few seconds.

Although it feels instant, AI is actually solving many smaller problems one after another.

Try It Yourself !!

Solve a Real-Life Problem

Choose one problem from your daily life.

My study table becomes messy.
I forget my homework.
I wake up late.
I cannot find my socks.
I waste too much time before school.

Now complete the table.

My Problem	My Solution
_____	_____
_____	_____
_____	_____

Think and Explain

Can two students solve the same problem in different ways?
Give one example from school.

_____
_____
_____

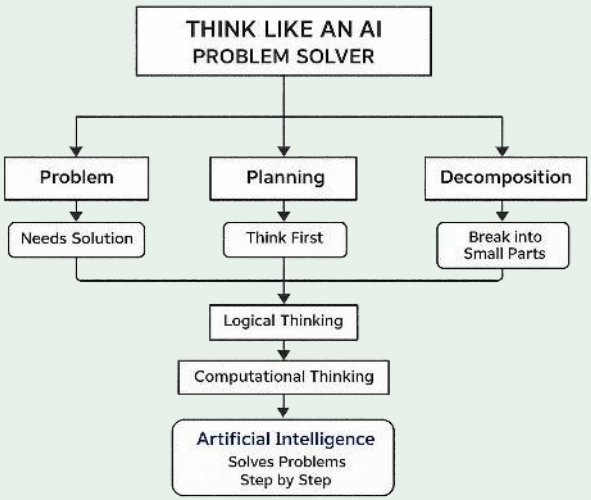
📝 Revision Summary

✔️ A problem is a situation that needs a solution.
✔️ A solution is a way to solve a problem.
✔️ Good problem solvers think before they act.
✔️ Planning helps us to organise our work and avoid mistakes.
✔️ Decomposition means breaking a big problem into smaller, easier tasks.
✔️ Every big task becomes easier when completed one small step at a time.
✔️ Different people may solve the same problem in different ways.

📖 Glossary

Problem: A situation or challenge that needs to be solved.
Solution: A way of solving a problem.
Planning: Thinking about the steps before starting a task.
Decomposition: Breaking a big problem into smaller, easier parts.

Mind Map



📝 Exercise Time

A. Fill in the Blanks

1. A _____ needs a solution.
2. _____ means thinking before starting a task.
3. Breaking a large task into smaller tasks is called _____.
4. AI solves problems by following _____.
5. A _____ is a way to solve a problem.

B. True or False

1. Good planning saves time. ( )
2. Every problem has only one solution. ( )
3. AI follows instructions carefully. ( )
4. Decomposition makes work more difficult. ( )
5. Students can improve their problem-solving skills through practice. ( )

C. Match the Following

Column A	Column B
1. problem	a. solves a problem
2. solution	b. Think before starting
3. Planning	c. Follows instructions
4. Decomposition	d. Divide into smaller tasks
5. AI	e. need a solution

D. Multiple Choice Questions

1. Which of these shows decomposition?
a) Cleaning an entire house in one minute b) Cleaning one room at a time
c) Leaving everything unfinished d) Waiting for someone else

2. Which activity requires planning?
a) Throwing books anywhere b) following a timetable
c) Forgetting homework d) sleeping anytime

3. Which thinking skill breaks a big problem into smaller tasks?
a) Drawing b) Singing c) Decomposition d) food

4. Artificial Intelligence solves problems by:
a) By guessing b) Solve problems step by step c) By copying people d) Waste time

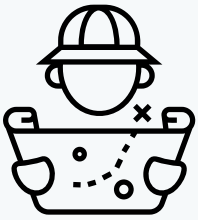
E. Short Answer Questions

1. What is a problem?
2. What is a solution?
3. Why is planning important?
4. Explain decomposition with one example.
5. How does AI solve problems?

F. Long Answer Questions

1. Your classroom becomes untidy every afternoon. Write six steps your class can follow to solve this problem.
2. Explain how planning helps you to prepare for your examination.
3. Describe one situation where AI helps people to solve problems in everyday life.
4. How are humans and AI different while solving problems?

Subject Enrichment / Activity Corner



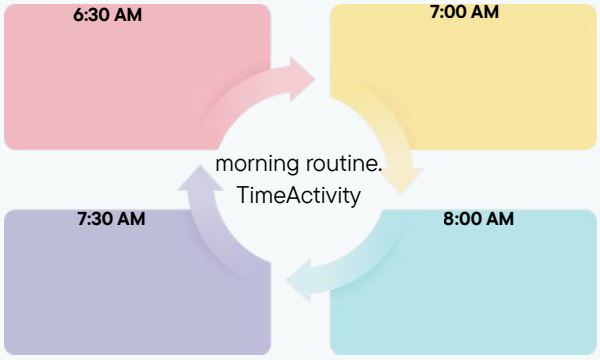
Activity 1: Problem Detective
Look carefully at the pictures below.
Circle only the problems.






Activity 2: My Daily Planner
Fill in your morning routine.

- TimeActivity
- 6:30 AM
- 7:00 AM
- 7:30 AM
- 8:00 AM



Activity 3: Think about a difficult problem you solved recently.
Write:
What was the problem? _____
How did you solve it?_____
Which step was the most difficult? _____
What did you learn?_____

CHALLENGE

Activity 4: Challenge yourself
Imagine you are designing an AI robot that helps students every morning.
Write five jobs you would teach the robot to do.

1._____
2._____
3._____
4._____
5._____

AI LAB Activity

Let's Solve Problems with ChatGPT, Claude & DeepSeek

What You Will Learn

In this chapter, you learned that every big problem can be solved by breaking it into smaller steps. Now let's see how different AI assistants solve the same problem.

Teacher/Parent Note: Students should use AI with adult guidance and always think about the answers instead of copying them.

Activity 1 Ask ChatGPT

Open ChatGPT and type:

"I want to organize my school bag for tomorrow.
Can you help me make a step-by-step plan?"

Write the answer here:_____

_____

_____

_____

_____

Activity 2 Ask Claude

Now ask Claude the same question.

"I want to organize my school bag for tomorrow. Can you help me make a step-by-step plan?"

Did Claude give a different answer?

Yes □

No □

Write one new idea you learned.

_____

Activity 3 Ask DeepSeek

Ask DeepSeek:

"What is the easiest way to pack my school bag?"

What advice did it give?

_____

Compare the Three AI Helpers

AI Tool What did it suggest?

ChatGPT _____

Claude _____

DeepSeek _____