TOUCHPAD®

Artificial Intelligence

Teacher's Manual

Extended Support for Teachers

7

ORANGE®

Teacher's Time Table

Periods / Days	0	I	II	III	IV		V	VI	VII	VIII
Monday						B				
Tuesday						R				
Wednesday						E				
Thursday						A				
Friday						K				
Saturday										

DEVELOPMENT MILESTONES IN A CHILD

Development milestones are a set of functional skills or age-specific tasks that most children can do at a certain age. These milestones help the teacher to identify and understand how children differ in different age groups.

Age 5 - 8 Years	
Physical	• First permanent tooth erupts • Shows mature throwing and catching patterns • Writing is now smaller and more readable • Drawings are now more detailed, organised and have a sense of depth
Cognitive	• Attention continues to improve, becomes more selective and adaptable • Recall, scripted memory, and auto-biographical memory improves • Counts on and counts down, engaging in simple addition and subtraction • Thoughts are now more logical
Language	• Vocabulary reaches about 10,000 words • Vocabulary increases rapidly throughout middle childhood
Emotional/Social	• Ability to predict and interpret emotional reactions of others enhances • Relies more on language to express empathy • Self-conscious emotions of pride and guilt are governed by personal responsibility • Attends to facial and situational cues in interpreting another's feelings • Peer interaction is now more prosocial, and physical aggression declines

"If you cannot do great things, do small things in a great way."

Age 9 - 11 Years	
Physical	• Motor skills develop resulting enhanced reflexes
Cognitive	• Applies several memory strategies at once • Cognitive self-regulation is now improved
Language	• Ability to use complex grammatical constructions enhances • Conversational strategies are now more refined
Emotional/Social	• Self-esteem tends to rise • Peer groups emerge

Age 11 - 20 Years	
Physical	• If a girl, reaches peak of growth spurt • If a girl, motor performance gradually increases and then levels off • If a boy, reaches peak and then completes growth spurt • If a boy, motor performance increases dramatically
Cognitive	• Is now more self-conscious and self-focused • Becomes a better everyday planner and decision maker
Emotional/Social	• May show increased gender stereotyping of attitudes and behaviour • May have a conventional moral orientation

Managing the children's learning needs according to their developmental milestones is the key to a successful teaching-learning transaction in the classroom.

"Family is the most important thing in the world."

TEACHING PEDAGOGIES

Pedagogy is often described as the approach to teaching. It is the study of teaching methods including the aims of education and the ways in which such goals can be achieved.

Lesson Plans

A lesson plan is the instructor's road map which specifies what students needs to learn and how it can be done effectively during the class time. A lesson plan helps teachers in the classroom by providing a detailed outline to follow in each class.

A lesson plan addresses and integrates three key components:

- Learning objectives
- Learning activities
- Assessment to check the student's understanding

A lesson plan provides an outline of the teaching goals:

Before the class:

1. Identify the learning objectives.
2. Plan the lesson in an engaging and meaningful manner.
3. Plan to assess student's understanding.
4. Plan for a lesson closure.

During the class:

Present the lesson plan.

After the class:

Reflect on what worked well and why. If needed, revise the lesson plan.

"Knowing yourself is the beginning of all wisdom."

Teaching Strategies

Numerous strategies have evolved over the years to facilitate the teaching-learning process in the classrooms.

Direct Instruction

Performance Activities

Classroom Discussion

Effective Teaching Strategies

Student Research

Small Group Work

Problem Solving

Cooperative Learning

Bloom's Taxonomy

Bloom's Taxonomy was created by **Dr Benjamin Bloom** and several of his colleagues, to promote higher forms of thinking in education instead of rote learning. There are three domains of learning: cognitive (mental), affective (emotional), and psychomotor (physical). However, when we refer to Bloom's Taxonomy we speak of the cognitive domain. Bloom's Taxonomy is a list of cognitive skills that is used by teachers to determine the level of thinking their students have achieved. As a teacher, one should attempt to move students up the taxonomy as they progress in their knowledge.

Produce something new

Level 6

Creating

Take apart information to show relationships, causes and connections

Level 5

Evaluating

Level 4

Analysing

Level 3

Applying

Explain ideas or concepts

Level 2

Understanding

Level 1

Remembering

Recall facts and basic concepts

Use information in new situations, to answer questions or solve problems

Justify a stand or position

Teachers should focus on helping students to remember information before expecting them to understand it, helping them understand it before expecting them to apply it to a new situation, and so on.

"If you have no confidence in self, you are twice defeated in the race of life."

LESSON PLAN

Artificial Intelligence

1. Introduction to AI

Teaching Objectives

Students will learn about

☞ What is AI?

☞ Difference between Human and Machine Intelligence

☞ AI as Defined by Different Organizations

☞ Types of AI

Teaching Plan

Before starting the chapter, ask the students to read the conversation given in page number 7 to understand the recap of the topic.

Number of Periods	
Theory	Practical
2	1

Start the chapter by giving an introduction of AI to the students with the help of using real time examples.

Share the difference between Human and Machine Intelligence to the students in detail and explain all the differences in between these two.

Discuss with the students about how AI is defined by Different Organizations in detail like:

● World Economic Forum

● Niti Aayog: National Strategy for Artificial Intelligence (NSAI)

● European Artificial Intelligence (AI) Leadership, the Path for an Integrated Vision

● Encyclopaedia Britannica

Ask the student to solve the exercise given on page number 10 as **AI Reboot**.

Explain the types of AI to the students with the help of proper examples.

```
              Artificial
             Intelligence
         ┌────────┼────────┐
      Weak AI   Strong AI   Super AI
```
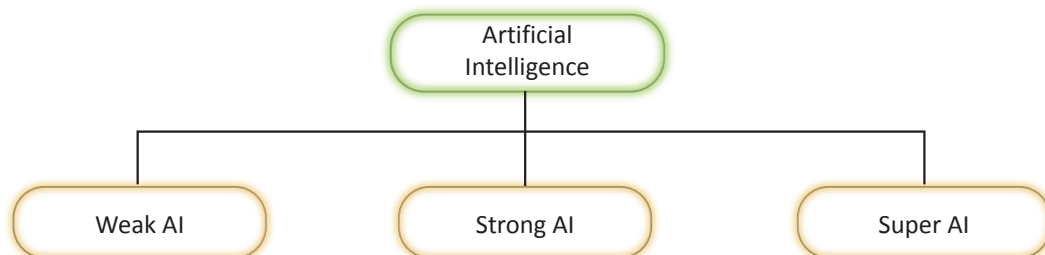
Define the meaning and purpose of following AI to the students:

- Weak AI
- Strong AI
- Super AI

Ask the students to solve the task given on page number 13 as **AI Task**.

Make sure to ask the students to scan and watch the video given on page 13. Encourage the students to make presentation on the topic learned and discuss in class.

Extension

Ask the students some oral questions based on this chapter.

Q. What is AI?

Q. What is the difference between Human and Machine Intelligence?

Q. Define AI stated by the following organizations:
   a. World Economic Forum
   b. Niti Aayog
   c. European Artificial Intelligence (AI) Leadership
   d. Encyclopaedia Britannica

Q. How many types of AI are there?

Q. Define Weak AI.

Q. Define Strong AI.

Q. Define Super AI.

Evaluation

Encourage the students to walk-through the chapter and ask them to play the game given on page 14, 15 and 16 on their own under the name **AI Game** after learning about the rules and basics.

After explaining the chapter, let the students do the exercises given on Page 17 and 18 in the main course book as **AI Quiz** and **Exercise**. Tell them to solve the critical and computational skill developing exercises as **AI in Life** and **AI Deep Thinking** given on Page 18.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Page 18 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the students to search about more types of AI other than the one taught in this chapter.

2. Pioneers in the Field of AI

Teaching Objectives

Students will learn about

- Alan Turing
- Ross Quillian
- Marvin Minsky
- John McCarthy
- Edward Feigenbaum
- IBM

Teaching Plan

Before starting the chapter, ask the students to read the conversation given in page number 19 to understand the recap of the topic.

Start the chapter with a quick background of AI involved in our day-to-day lives.

Tell the students about **Alan Turing** and his contribution in the field of AI along with other subjects. Also, tell the students about his concept of Computing Machinery and Intelligence which later introduced as Turing Test.

Share the information to the students about the "Father of Artificial Intelligence" – **John McCarthy**. Also, tell the students about his work like developing LISP and becoming a pioneer in Mathematical Logic for Artificial Intelligence.

Tell the students about **Ross Quillian** and his contribution in the field of AI and electronics & communication. Also, tell the students about his work SYNTHEX which is widely accredited in the field of AI.

Share the information to the students about the "Father of Expert System" – **Edward Feigenbaum**. Also, tell the students about his work like developing EPAM.

Tell the students about **Marvin Minsky** and his contribution in the field of AI. Also, tell the students about his work on Artificial Neural Networks.

Share the information to the students about the company **IBM**. Also, tell the students about the pioneer work in the field of Artificial Intelligence with its development and creation of Deep Blue.

Ask the student to solve the exercise given on page number 22 as **AI Reboot**.

Ask the students to solve the task given on page number 22 as **AI Task**.

Extension

Ask the students some oral questions based on this chapter.

Q.   Define the role of the following in the field of AI:

     a.   Alan Turing   b.   John McCarthy

     c.   Ross Quillian   d.   Edward Feigenbaum

     e.   Marvin Minsky   f.   IBM

Evaluation

Encourage the students to walk-through the chapter and ask them to play the game given on page 22 and 23 on their own under the name **AI Game**.

After explaining the chapter, let the students do the exercises given on Page 24 and 25 in the main course book as **AI Quiz** and **Exercise**. Tell them to solve the critical developing exercise as **AI Deep Thinking** given on Page 25.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Page 25 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the students search information about SYNTHEX, Deep Blue and LISP.

3. Domains of AI

Teaching Objectives

Students will learn about

☞   Domains of AI

☞   Real Life Applications of Different Domains of AI

Teaching Plan

Number of Periods	
Theory	Practical
2	1

Before starting the chapter, ask the students to read the conversation given in page number 26 to understand the recap of the topic.

Start the chapter with a walk-through of AI as part of computer science.

Explain the Domains of AI to the students in details along with the usage/application of the same.

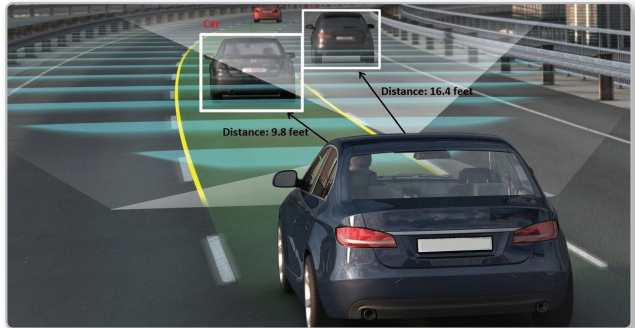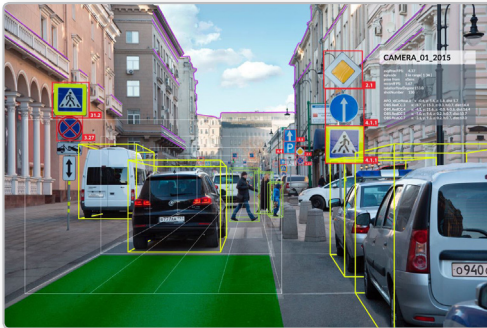Natural Language Processing   Big Data   Computer Vision

Define Natural Language Processing (NLP) to the students and tell the usage of the same.

Tell the students about Big Data and explain the usage of the same in the field of AI.

Share the information with the students about Computer Vision along with the applications of Computer Vision.

Explain the real life application of different Domains of AI which are Big Data, NLP and Computer Vision.

Ask the student to solve the exercise given on page number 28 and 33 as **AI Reboot**.

Ask the students to solve the task given on page number 30 as **AI Task**.

Extension

Ask the students some oral questions based on this chapter.

Q. What are the domains of AI?

Q. Define the following:

    a. Big Data

    b. NLP

    c. Computer Vision

Evaluation

Encourage the students to walk-through the chapter and ask them to play the game given on page 33 and 34 on their own under the name **AI Game.**

After explaining the chapter, let the students do the exercises given on Page 35 and 36 in the main course book as **AI Quiz** and **Exercise**. Tell them to solve the critical and computational skill developing exercises as **AI in Life** and **AI Deep Thinking** given on Page 36.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Page 36 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the students to search more real life applications of Big Data, NLP and Computer Vision.

4. Fields of AI

Teaching Objectives

Students will learn about

☞ Smartphone Industry

☞ Banking and Financial Sector

☞ Autonomous Vehicles

☞ Navigation

☞ Education

☞ Social Media Platforms

☞ E-Commerce

☞ Security and Surveillance

☞ Healthcare

Teaching Plan

Number of Periods	
Theory	Practical
2	1

Before starting the chapter, ask the students to read the conversation given in page number 39 to understand the recap of the topic.

Start the chapter with the point how AI is commonly used in wide range of fields.

Explain to the students how AI is used in following fields:

● Smartphone Industry

● Banking and Financial Sector

● Autonomous Vehicles

● Navigation

● Education

● Social Media Platforms

● E-commerce

● Security and Surveillance

● Health care

Ask the student to solve the exercise given on page number 41 and 44 as **AI Reboot**.

Ask the students to solve the task given on page number 45 and 46 as **AI Task**.

Extension

Ask the students some oral questions based on this chapter.

Q. Define the role of AI in following field:
   a. Smartphone Industry
   b. Social Media Platforms
   c. Banking and Financial Sector
   d. E-commerce
   e. Autonomous Vehicles
   f. Security and Surveillance
   g. Navigation
   h. Health care
   i. Education

Evaluation

Encourage the students to walk-through the chapter and ask them to play the game given on page 47, 48 and 49 on their own under the name **AI Game**.

After explaining the chapter, let the students do the exercises given on Page 50 and 51 in the main course book as **AI Quiz** and **Exercise**. Tell them to solve the critical and computational skill developing exercises as **AI in Life** and **AI Deep Thinking** given on Page 52.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Page 52 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the students to research more fields where AI plays an important role other than taught in the chapter.

5. Concept of Smart Living

Teaching Objectives

Students will learn about

☞   Smart Homes

☞   Devices Used in Smart Homes

Teaching Plan

Number of Periods	
Theory	Practical
1	1

Before starting the chapter, ask the students to read the conversation given in page number 53 to understand the recap of the topic.

Start the chapter with an introduction of variety of gadgets used in our homes to make the life easier.

Explain the meaning and purpose of Smart Homes to the students. Also, tell them how these devices are beneficial like:

- Power Saver
- Protect Home and its Belongings
- One Point Access
- Remote Control
- Protection
- Increased energy Efficient
- Interactive Home
- Flexibility
- Climate Control

Share the devices which are used in smart homes to the students:

- Smart Hubs
- Smart Cameras
- Smart Lighting
- Smart Speakers
- Smart Remote Controllers
- Video Doorbells
- Smart Smoke Detectors
- Smart Thermostats
- Ego Lawnmower and Eve Aqua

Ask the student to solve the exercise given on page number 61 as **AI Reboot**.

Ask the students to solve the task given on page number 61 as **AI Task**.

Make sure to ask the students to scan and watch the video given on page 61. Encourage the students to make presentation on the topic learned and discuss in class.

Extension

Ask the students some oral questions based on this chapter.

Q. What are smart devices?

Q. What is the concept of smart home?

Q. What are the benefits of smart home?

Q. Define the following:

    a. Smart Hubs
    b. Video Doorbells
    c. Smart Cameras
    d. Smart Smoke Detectors
    e. Smart Lighting
    f. Smart Thermostats
    g. Smart Speakers
    h. Ego Lawnmower and Eve Aqua
    i. Smart Remote Controllers

Evaluation

After explaining the chapter, let the students do the exercises given on Page 62 and 63 in the main course book as **AI Quiz** and **Exercise**. Tell them to solve the computational skill developing exercise as **AI Deep Thinking** given on Page 63.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Page 63 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the students to search about some more devices used in smart homes.

6. Future of Artificial Intelligence

Teaching Objectives

Students will learn about

☞ Future of AI
☞ Traffic Management
☞ Smart Highway

☞ Safety and Security
☞ Smart Homes and Cities
☞ Types of AI

Teaching Plan

Before starting the chapter, ask the students to read the conversation given in page number 64 to understand the recap of the topic.

Number of Periods	
Theory	Practical
2	1

Start the chapter with details about the AI wave and scope in all fields.

Tell the students about the three stages of AI:

- First Stage
- Second Stage
- Third Stage

Explain the Future of AI to the students with the concept that is being planned in fields like:

- Automated Transportation
- Safety and Security
- Traffic Management
- Smart Homes and Cities
- Smart Highway
- Health Care Industries
- AI in Education
- AI in Finance
- AI in Military and Cybersecurity

Also, explain the examples or relatable ideas for each topic for better understanding.

Ask the student to solve the exercise given on page number 66 as AI Reboot.

Ask the students to solve the task given on page number 70 as AI Task.

Extension

Ask the students some oral questions based on this chapter.

Q.   What is the future of AI?

Q.   What are the three stages of AI evolution?

Q.   Define:
   a.   Automated Transportation
   b.   Safety and Security
   c.   Traffic Management
   d.   Smart Homes and Cities
   e.   Smart Highway
   f.   Health Care Industries
   g.   AI in Education
   h.   AI in Finance
   i.   AI in Military and Cybersecurity

Evaluation

After explaining the chapter, let the students do the exercises given on Page 71 and 72 in the main course book as **AI Quiz** and **Exercise**. Tell them to solve the computational skill developing exercise as **AI Deep Thinking** given on Page 72.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Page 72 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the students to research about the more fields where AI has a future.