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# TOUCHPAD

Artificial Intelligence Ver. 2.0

# Teacher's Manual

*Extended Support for Teachers*

ORANGE
www.orangeeducation.in
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# Teacher's Time Table

| Periods / Days | 0 | I | II | III | IV | BREAK | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|---|---|
| Monday | | | | | | | | | | |
| Tuesday | | | | | | | | | | |
| Wednesday | | | | | | | | | | |
| Thursday | | | | | | | | | | |
| Friday | | | | | | | | | | |
| 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<br>• Shows mature throwing and catching patterns<br>• Writing is now smaller and more readable<br>• Drawings are now more detailed, organised and have a sense of depth |
| **Cognitive** | • Attention continues to improve, becomes more selective and adaptable<br>• Recall, scripted memory, and auto-biographical memory improves<br>• Counts on and counts down, engaging in simple addition and subtraction<br>• Thoughts are now more logical |
| **Language** | • Vocabulary reaches about 10,000 words<br>• Vocabulary increases rapidly throughout middle childhood |
| **Emotional/Social** | • Ability to predict and interpret emotional reactions of others enhances<br>• Relies more on language to express empathy<br>• Self-conscious emotions of pride and guilt are governed by personal responsibility<br>• Attends to facial and situational cues in interpreting another's feelings<br>• Peer interaction is now more prosocial, and physical aggression declines |

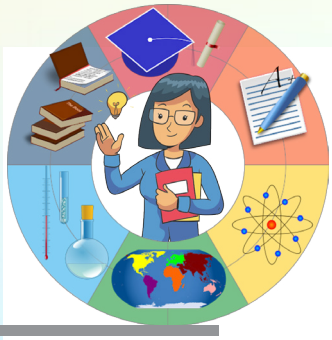
"If you cannot do great things, do small things in a great way."

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

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

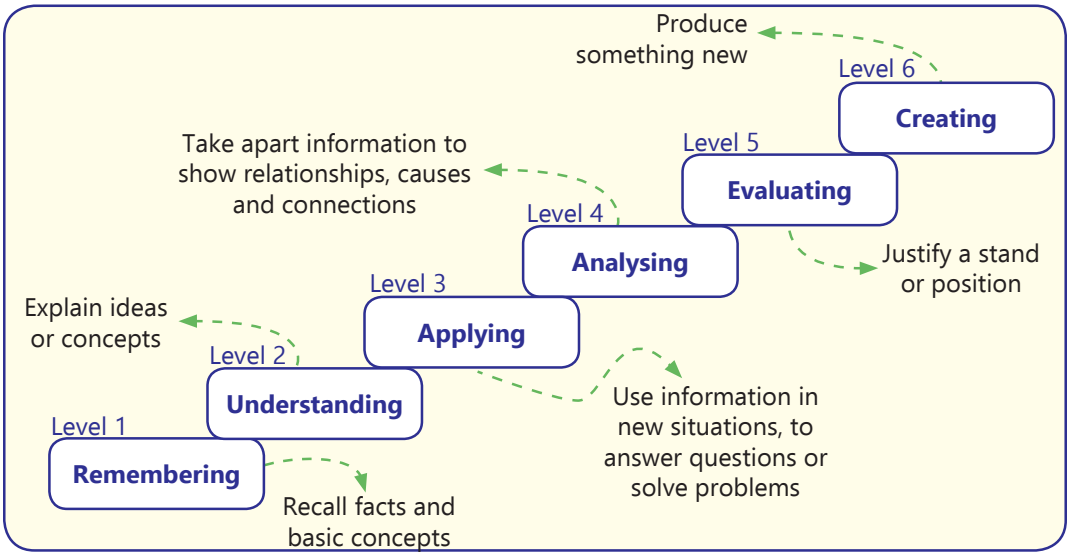
"Knowing yourself is the beginning of all wisdom."

## Teaching Strategies

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


## 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.




Teachers should focus on helping students 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."

Class XII

# Lesson Plan

Artificial Intelligence

Part-A: Employability Skills

## 1. Communication Skills-IV

### Teaching Objectives

Students will learn about

- ☞ Communication
- ☞ Listening Skills
- ☞ Writing Sentences
- ☞ Effective Communication
- ☞ Parts of Speech

**Number of Hours**
Theory
10

### Teaching Plan

Before starting the chapter, give an introduction of Communication to the students.

Tell the students Communication is a two-way process in which information or messages are communicated between individuals through the use of words, symbols, signs, or behaviour.

Let them know that Effective communication necessitates the ability to communicate messages that are clear, concise and accurate.

Teach the students about Listening skills to the students through a video or an activity.

Also, teach the concept of active listening to the students with the help of examples.

Share with the students about the Parts of Speech in detail by covering the following topics given below:

- Using Capital Letters
- Using Punctuation
- Basic Parts of Speech

Share the meaning and purpose of writing skills with the students that it is an ability to express your meaningful ideas or thoughts.

Also explain the types of **Sentences including all three classifications**.

The different types of sentences are given below:

- Simple Sentence
- Complex Sentence
- Compound Sentence



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Tell the students how to construct a paragraph along with the help of examples in brief.

Ask the students to solve the task given on page 21 as **AI Task**.

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

## Extension

Ask the students some oral questions based on this chapter.

Q. What do you mean by effective communication?

Q. What do you understand by active listening?

Q. What are the phases of active listening?

Q. What do you mean by Parts of Speech.

Q. What is a paragraph?

Q. How do you construct a paragraph?

Q. What are the two types of Objects?

Q. What are the benefits of listening skills?

## Evaluation

After explaining the chapter, let the students do the exercises given on pages 27 to 32 in the main course book as **AI Quiz** and **Exercise (Solved and Unsolved Questions)**.

Take the students to the computer lab and let them practice the activity given in **Lab Activity** section given on page 32 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 create a PowerPoint Presentation on the topic Types of Communication.

Class XII

# Lesson Plan

Part-B: Subject Specific Skills

Artificial Intelligence

## 1. Capstone Project

### Teaching Objectives

Students will learn about

- Understanding the Capstone Project
- Understanding/Defining the Problem
- Decomposing the Problem through DT Framework
- Using an Analytical Approach
- Model Validation
- Metrics of Model Quality—Simple Maths
- Introduction to Commonly used Algorithms
- Showcase through a Compelling Story

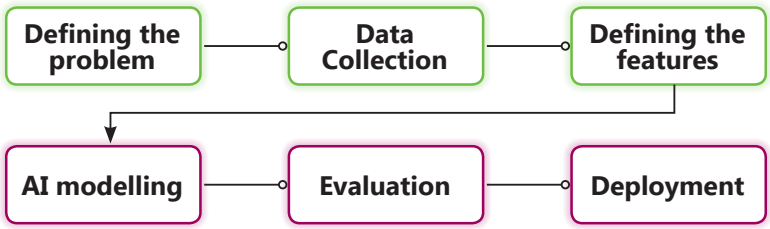
| Number of Periods | |
|---|---|
| Theory | Practical |
| 20 | 10 |

### Teaching Plan

While teaching this chapter, tell the students that A capstone project is a comprehensive, independent, and final project undertaken as a part of the curriculum designed to assess the skills, knowledge, and expertise a student has acquired. Such a project often involves researching a topic, evaluating a new technique or method, developing a health plan, researching a character or event in history, or even the composition of a sketch or play.

Let the students understand and define the problem.

Let them know that every AI project goes through these six steps which are shown below:




Tell them that the Design Thinking methodology provides a solution-based approach to solving problems.



IMPRINT 1

Also, explain Problem Decomposing using Design Thinking Framework.

Demonstrate all five stages of the Design Thinking Process with the help of examples.

Those stages are given below:

- Empathize
- Define
- Ideate
- Prototype
- Test

Teach them how to use an Analytical Approach and It consists of 10 stages that form an iterative process using data to discover information. Each step plays an important role in the context of the overall methodology. Those are:

- Stage 1: Business Understanding
- Stage 2: Analytic Approach
- Stage 3: Data Requirements
- Stage 4: Data Collection
- Stage 5: Data Understanding
- Stage 6: Data Preparation
- Stage 7: Modelling
- Stage 8: Evaluation
- Stage 9: Deployment
- Stage 10: Feedback

Explain the two types of validation methods to the students in detail. Those are:

- Train Test Split Evaluation
- Cross-Validation Procedure

Explain the concept of Metrics of Model Quality—Loss Function in detail:

Also, explain the following topics:

- MSE (Mean Squared Error) with its advantages and disadvantages.
- RMSE (Root Mean Square Error)
- Calculating RMSE in Python
- Mean Square Percentage Error (MAPE)
- Hyperparameters

Explain students to commonly used algorithms in artificial intelligence, including supervised, unsupervised, and reinforcement learning algorithms, and their applications in machine learning.

Ask the students to read the **Brainy Fact** given on pages 117 and 125.

Ask the students to solve the task given on page 125 as **AI Reboot**.

Make sure to ask the students to scan and watch the video given on pages 116,119, 125, 127, 128, 132 and 133 as **Video Session**.

## Extension

Ask the students some oral questions based on this chapter.

Q. What do you mean by Capstone Project?

Q. What are the five stages of the Design Thinking Framework?

Q. Give any five examples of a Capstone project.

Q. Define the terms:

- Empathize
- Define
- Ideate
- Prototype
- Test

Q. What is the first stage of an Analytical Approach?

Q. Define feedback.

Q. Why feedback is necessary?

## Evaluation

Encourage the students to walk through the chapter

After explaining the chapter, let the students do the exercises given on Pages 138 to 152 of the main course book as **AI Quiz** and **Exercise(Solve and Unsolved)**. Tell them to solve the critical and computational skill-developing exercises as **AI in Life** and **AI Deep Thinking** is given on page 153.

Take the students to the computer lab and let them practice the activity given in the **AI Lab** given on page 153 in the main course book. This will enhance the abilities of the students and serve as a Subject Enrichment Activity.

Ask the students to solve the exercise given on page 155 as **AI Ready 1**.

## Suggested Activity

Ask the students to create an Image project using the Teachable Machine tool. The link is given below:

https://teachablemachine.withgoogle.com/train