TOUCHPAD

Artificial Intelligence Ver. 1.1

5

Teacher's Manual

Extended Support for Teachers

ORANGE
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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 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 in 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

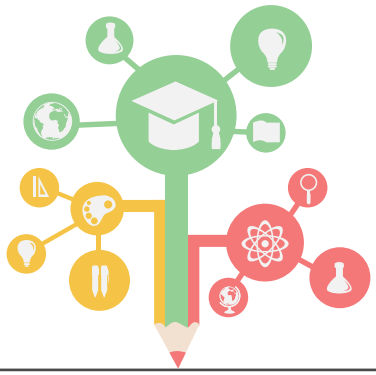
Age 11 - 20 Years

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 need 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.

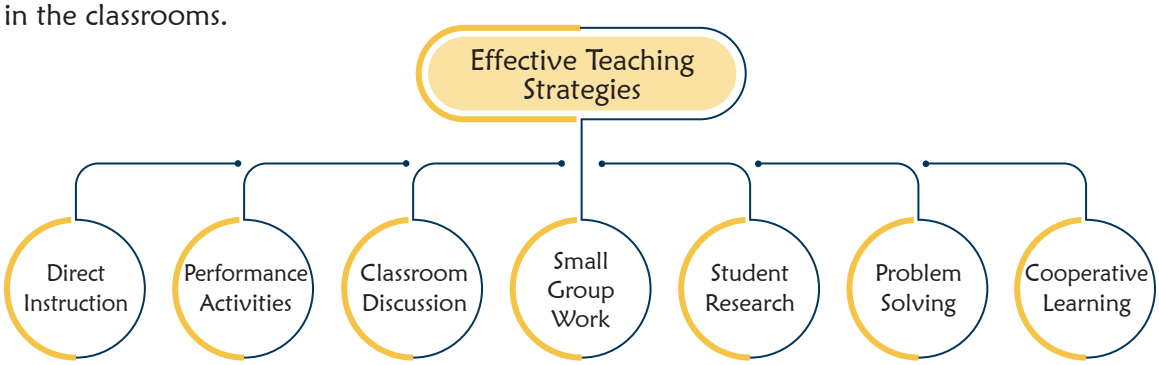
After the class

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

"Knowing yourself is the beginning of all wisdom."

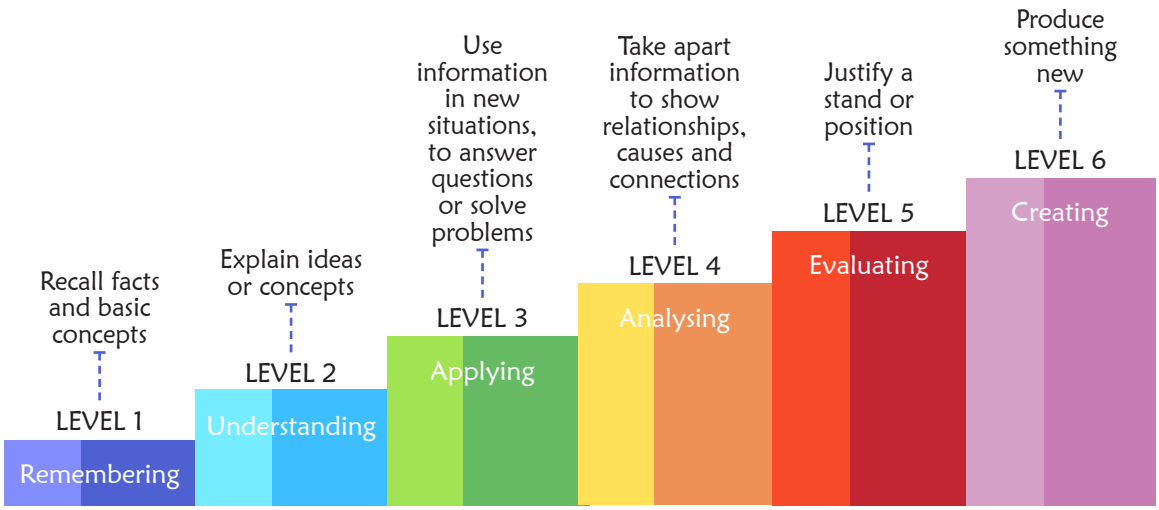
Teaching Strategies

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 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."

CLASS 4

LESSON PLAN

1 Evolution of AI

Teaching Objectives

Students will learn about

- Developments in AI

Number of Periods	
Theory	Practical
2	1

Teaching Plan

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

Let the students know that since ancient times, humans have been trying to make their lives easier by innovating different machines. While creating these machines, he reached a certain stage when these machines were not capable enough to handle certain tasks without a brain.

Make the students aware of the developments in AI during different decades.

Let the students know that during 1950 to 1960, two major contributions were observed. One of them was that Alan Turing submitted a paper about the possibility of creating a machine that could think in 1950. This became a test for machines to check the thinking capability of a machine.

Make the students aware of the fact that during 1960 to 1970, two new systems were developed which became a great contribution to the field of AI. The first chatbot ELIZA was created in MIT Artificial Intelligence Laboratory by Joseph Weizenbaum in 1966.

Explain to the students that during 1971 to 2000 in 1973, **WABOT** was created by **Ichiro Kato** and constructed by Unimation. This was the first step towards building a humanoid robot.

Let the students know that in the 2000s, AI technology was successfully established with many successful attempts like:

Kismet, a robot developed by **Professor Cynthia Breazeal** could recognise and simulate emotions with its face.

Make the students aware of the fact that it was an era of revolution in the field of artificial intelligence with the following developments:

Microsoft launched Kinect for **Xbox 360**, the first gaming device that tracked human movement using a 3D camera and infrared detection.

Ask the students to solve the task given on page numbers 12 and 17 as **AI Reboot**.

Ask the students to solve the task given on page number 17 as **AI Task**.

Ask the students to read the **Brainy Fact** given on page 8.

Extension

Ask the students some oral questions based on this chapter.

Q. What is Alan Turing known for?
Q. Who coined the term Artificial Intelligence?
Q. What is ELIZA?
Q. Who created WABOT in 1973?
Q. What is Deep Blue?
Q. What is Kismet?
Q. When and by which company was ASIMO released?
Q. What is Xbox 360?
Q. What is Amazon Alexa?
Q. What is Google Home?

Evaluation

Encourage the students to walk-through the chapter and ask them to play the game given on page 18 and 19 on their own under the name **AI Game**.

After explaining the chapter, let the students do the exercises given on pages 20, 21 and 22 in the main course book as **AI Quiz** and **Exercise**. Tell them to solve the critical thinking skills developing exercises as **AI in Life** given on page 22.

Take the students to the computer lab and let them practise the activities given in **AI Lab** section on page 22 in the main course book. This will enhance the ability of the students and serve as an subject enrichment activity.

Suggested Activity

Ask the students to search about more advanced versions of AI gadgets.

2 AI Terminologies

Teaching Objectives

Students will learn about

- Artificial Intelligence
- Aims of AI
- AI-Terminologies

Number of Periods	
Theory	Practical
2	1

Teaching Plan

Before starting the chapter, ask the students to read the conversation given on page number 23 to understand the recap of the topic.

Let the students know that computer is an electronic device that can store and process data according to the instructions given to it. It has become an essential part of our lives and its requirement is growing exponentially.

Make the students aware of the fact that Artificial Intelligence is a branch of computer science that pursues the creation of computers and machines which are as intelligent as human beings.

Explain to the students various aims and objectives of AI like implementing human intelligence in machines, creating expert system, solving complex problems, performing multiple tasks at once, planning ahead, improving the interaction between humans and machines, etc.

Let the students know that machine learning allows a machine to predict more accurate results without being explicitly programmed to do so. It is a subset of artificial intelligence.

Make the students aware of AI terminologies like algorithms, deep learning, training data, test data, pattern recognition, etc.

Ask the students to solve the task given on page numbers 30 and 31 as **AI Task**.

Encouraged the students to watch the link given in **Video Session** section on page 32.

Extension

Ask the students some oral questions based on this chapter.

Q. What is Computer?

Q. What is Artificial Intelligence?

Q. What are the Aims and Objectives of AI?

Q. What is Machine Learning?

Q. Define Algorithm.

Q. What is Deep Learning?

Q. What is Pattern Recognition?

Evaluation

Encourage the students to walk-through the chapter and ask them to play the game given on pages 30 and 31 on their own under the name **AI Game**.

After explaining the chapter, let the students do the exercises given on pages 32 and 33 in the main course book as **AI Quiz** and **Exercise**. Tell them to solve the critical thinking skills developing exercises as **AI Deep Thinking** given on page 33.

Suggested Activity

Ask the students to research more about new and trending AI terminologies.

3 AI in Popular Apps

Teaching Objectives

Students will learn about

- Siri
- Google Assistant
- Practo
- Swiggy
- Netflix
- Meta AI
- Alexa
- Google Maps
- YouTube

Number of Periods	
Theory	Practical
2	1

Teaching Plan

Before starting the chapter, ask the students to read the comic given in page number 34 to understand the recap of the topic.

While teaching this chapter, tell the students that deep learning techniques will provide machine to perform high-level thoughts, image recognition.

Let them know about the popular apps of AI which are:

- Siri
- Google Assistant
- Practo
- Swiggy
- Netflix
- Meta AI
- Alexa
- Google Maps
- YouTube

Also, teach the students through the Topic Animation of the lesson.

Extension

Ask the students some oral questions based on this chapter.

Q. Name a voice assistant that was released for iOS in February 2010.

Q. Which is a multimedia application that contains a plethora of videos for media consumption?

Q. When was Swiggy founded?

Q. Name the health assistant app.

Q. Which is a food delivering app that was created in the year 2014?

Q. What is the use of the Swiggy app?

Q. Which keyword is used to invoke Siri?

Q. What do you mean by Virtual Assistant?

Q. Is Siri a food delivering app?

Evaluation

Encourage the students to walk through the chapter and ask them to play the game given on pages 39 to 41 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 Pages 42 to 44 of the main course book as **AI Quiz** and **Exercise**. Tell them to solve the critical thinking exercises as **AI in Life** is given on page 44.

Take the students to the computer lab and let them practice the activity given in the **AI Lab** given on Page 44 in the main course book. This will enhance the abilities of the students and serve as a Subject Enrichment Activity.

Suggested Activity

Ask the students to try Quizzes and play games on the **Kuki** chatbot by using the link given below:

https://chat.kuki.ai/chat

4 Sustainable Development Goals (SDGs)

Teaching Objectives

Students will learn about

- What are Sustainable Development Goals (SDGs)?
- Role of AI to Achieve SDGs

Number of Periods	
Theory	Practical
2	1

Teaching Plan

Before starting the chapter, ask the students to read the comic given in page number 46 to understand the recap of the topic.

When teaching this chapter, you can explain to the students how the concept of smart machines came into existence.

Let them know about the Sustainable Development Goals (SDGs)

Introduce to the students to the 17 Sustainable Development goals.

Explain to the students the role of Artificial Intelligence (AI) in achieving the Sustainable Development Goals (SDGs).

Teach the students through Topic Animation and show the videos about artificial intelligence on the link given on pages 47 and 52 as **Video Session**.

Ask the students to solve the task given on page 51 as **AI Task** and **AI Reboot**.

Ask the students to read the **Brainy Fact** given on page 50.

Extension

Ask the students some oral questions based on this chapter.

Q. What are Sustainable Development Goals (SDGs)?

Q. How many SDGs were adopted by the General Assembly in 2015?

Q. What is the principle behind SDGs?

Q. What is the objective of Goal 1?

Q. What does Goal 2 aim to achieve?

Q. What is the focus of Goal 3?

Q. What is the purpose of Goal 4?

Q. Explain the aim of Goal 5.

Q. What are the objectives of Goal 6?

Q. Describe the targets of Goal 7.

Q. What does Goal 8 promote and ensure?

Q. What is the objective of Goal 9?

Q. Which goal reduces inequalities within and among countries?

Q. What does Goal 11 aim to achieve?

Q. What are the objectives of Goal 12?

Q. Describe the purpose of Goal 13.

Q. Explain the aim of Goal 14.

Q. What does Goal 15 focus on?

Q. What is the objective of Goal 16?

Q. Describe the purpose of Goal 17.

Evaluation

After explaining the chapter, let the students do the exercises given on pages 53 and 54 of the main course book as **AI Quiz** and **Exercise**. Tell them to solve the communication skill-developing exercises as **AI in Life** and **AI Deep Thinking** are given on pages 54 and 55.

Take the students to the computer lab and let them practice the activity given in the **AI Lab** section on page 55 in the main course book. This will enhance the abilities of the students and serve as a Subject Enrichment Activity.

Suggested Activity

Ask the students to create a poster on any of the 17 Sustainable Development Goals on an A3-size sheet.

5 Parts of Robots

Teaching Objectives

Students will learn about

- Difference Between Humans and Robots
- Essential Parts of Robots

Number of Periods	
Theory	Practical
2	1

Teaching Plan

Before starting the chapter, ask the students to read the comic given in page number 57 to understand the recap of the topic.

While teaching this chapter, tell the students that Robotics is the science and technology behind designing, manufacturing, and applying robots.

Make them understand the difference between humans and robots through the table given below:

S.No.	Humans	Robots
1.	Humans are organic entities.	Robots are mechanical devices.
2.	Once the human body dies, it never comes back to life.	A robot can be repaired.
3.	Humans have highly developed brains.	Robots have a trained brain.
4.	Humans are social beings.	Robots do not socialize.
5.	Humans are capable of performing crea-tive and innovative tasks.	Robots can handle only specialized tasks.
6.	Emotions and feelings are the domains of humans.	Robots do not display any such qualities.

Introduce the students to the essential parts of robots which are given below:

- Manipulator
- Locomotion Device
- Sensors
- End Effector
- Controller
- Power Supply

Teach the students through Topic Animation and show the videos about artificial intelligence on the link given on page 63 as **Video Session**.

Ask the students to solve the task given on page 63 as **AI Task**.

Extension

Ask the students some oral questions based on this chapter.

Q. How are humans and robots physically different?

Q. What happens to a human body after death compared to a robot?

Q. How are the brains of humans and robots described??

Q. What is the limitation of robots in handling tasks compared to humans?

Q. What are some essential parts of a robot mentioned?

Q. What is the purpose of a manipulator in a robot?

Q. How is an end effector described, and what tasks does it perform?

Q. What are the three types of locomotion devices used in robots?

Q. What are the two types of controllers?

Q. Which is the primary source for most robots?

Evaluation

Encourage the students to walk through the chapter and ask them to play the game given on pages 63 and 64 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 Pages 65 to 67 of the main course book as **AI Quiz** and **Exercise**. Tell them to solve the Productivity & Accountability and Creativity skill-developing exercises as **AI in Life** and **AI Deep Thinking** given on page 67

Take the students to the computer lab and let them practice the activity given in the **AI Lab** section on Page 67 in the main course book. This will enhance the abilities of the students and serve as a Subject Enrichment Activity.

Suggested Activity

Ask the students to create his/her own robot by using different parts, what would it look like? Draw a picture or describe its appearance, and don't forget to explain what each part does and how it helps the robot perform tasks on an A4-size sheet.