

AI RoboGenius

8

TEACHER'S MANUAL
Extended Support for Teachers

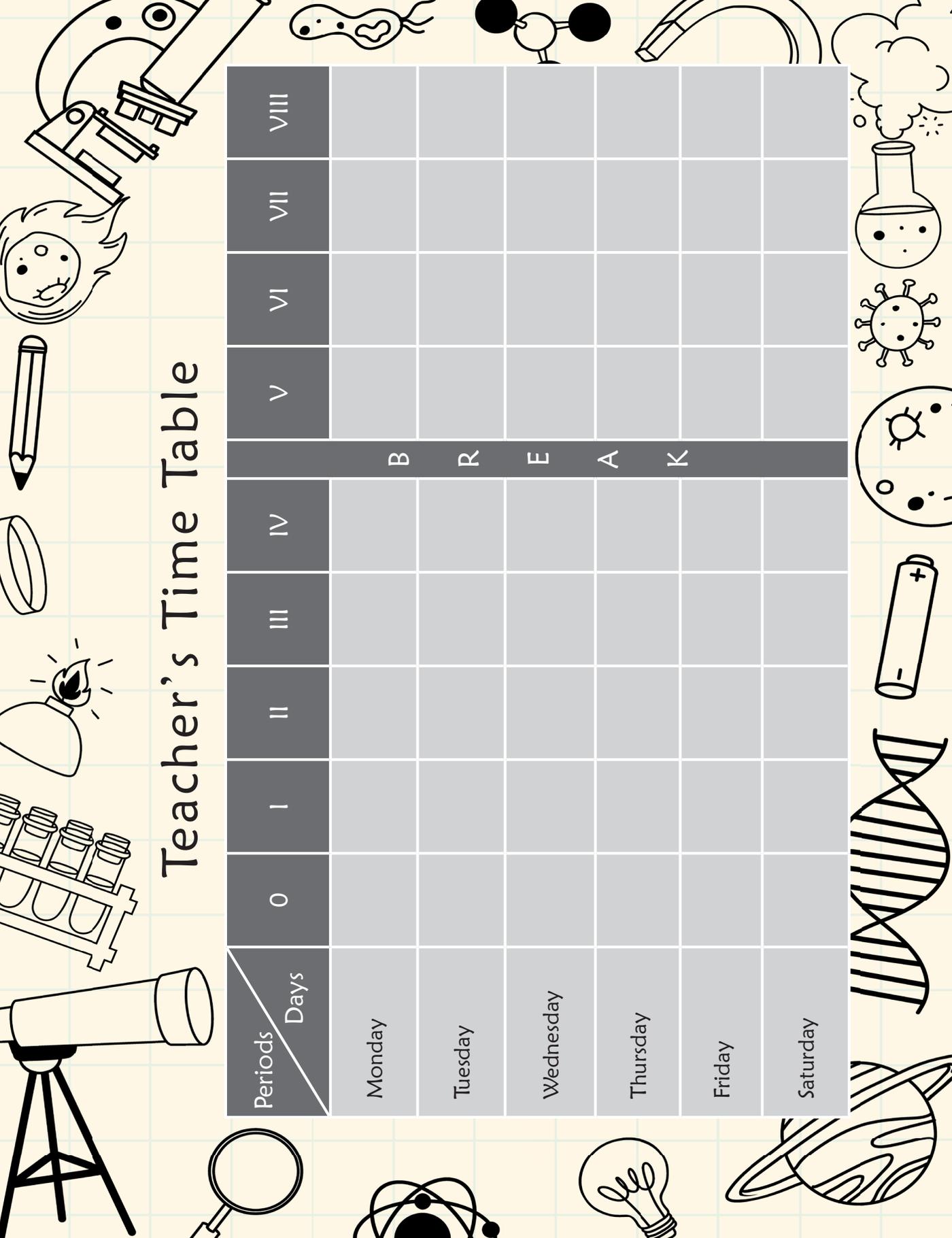


www.orangeeducation.in

Teacher's Time Table

Periods \ Days	0	I	II	III	IV	V	VI	VII	VIII
Monday									
Tuesday									
Wednesday									
Thursday									
Friday									
Saturday									

B R E A K



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

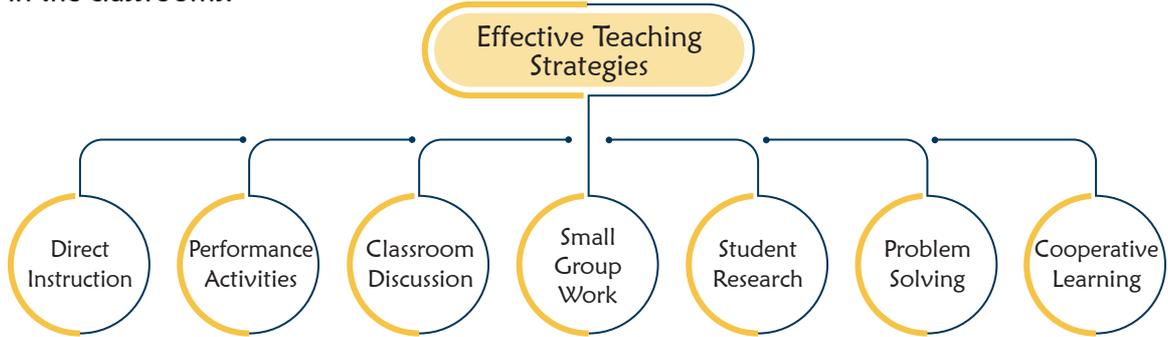
- May show increased gender stereotyping of attitudes and behaviour
- May have a conventional moral orientation

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. ”

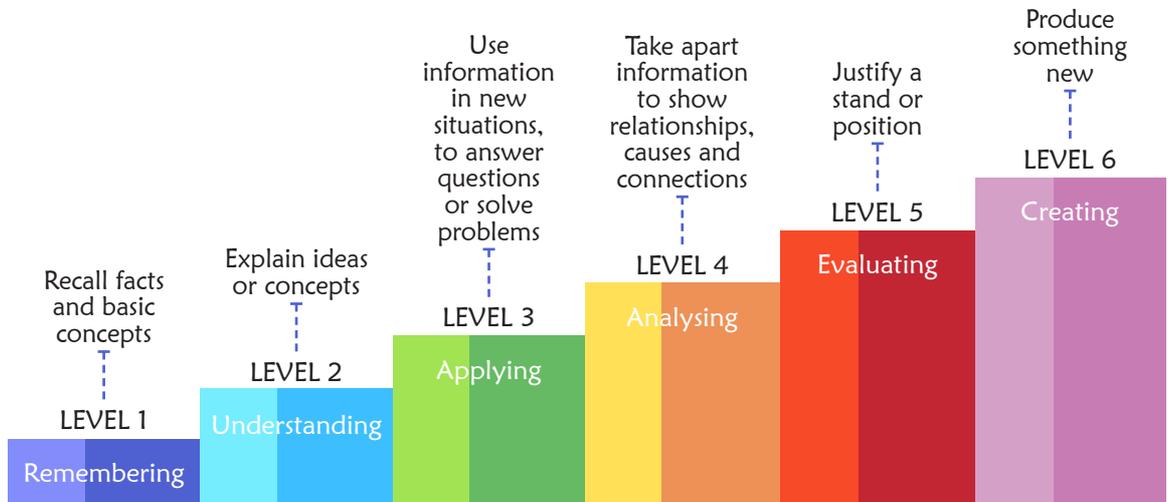
Teaching Strategies

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. ”

1 Stages of AI Project Cycle

Teaching Objectives

Students will learn about

- ✦ Overview of the Stages of AI Project Cycle
- ✦ Problem Scoping
- ✦ Data Acquisition
- ✦ Data Exploration
- ✦ Modelling
- ✦ Evaluation and Deployment

Teaching Plan

Number of Periods	
Theory	Practical
2	1

Introduce the concept of AI and the importance of a structured project cycle. Explain the relevance of each stage and how it contributes to building a successful AI model.

Discuss each stage of the AI Project Cycle:

- **Problem Scoping:** Define the problem and set goals.
- **Data Acquisition:** Discuss how to collect and prepare data.
- **Data Exploration:** Explain the process of analysing and visualising data to discover trends.
- **Modelling:** Show how to apply algorithms and train models.
- **Evaluation:** Assess model performance and adjust as necessary.
- **Deployment:** Implement the model in real-world scenarios.

Engage students in a hands-on activity where they will use the 4Ws Problem Canvas to scope a real-world problem, collect data, and present their findings.

Present the scenario of identifying an 'Earth-like exoplanet' and guide the students through each stage of the AI Project Cycle to solve the problem. Students will work in groups to map out the AI process for this problem.

Discuss with students how AI is applied in daily life, using examples like recommendation systems and traffic management.

Extension

Ask the students some oral questions based on this chapter.

- Q. What is the role of data exploration in the AI Project Cycle?
- Q. How can problem scoping help in setting clear goals for an AI project?
- Q. How can the evaluation stage affect the model before deployment?
- Q. How do AI techniques like supervised and unsupervised learning relate to real-world problem-solving?
- Q. How can the deployment stage ensure the model performs in a real-world environment?

Evaluation

Guide the students to complete the sections, such as **AI TASK** provided on page **11, 12, 18, 23, 26** and **27**.

Ask the students to answer the following question in the **VIDEO SESSION** section on page **09** and **25**.

After explaining the chapter, let the students do the **ROBO CHECK** on pages **28** and **29** in the main course book.

Encourage the students to complete the activity like **CASE STUDY** given on page **30**.

Ask the students to complete the **AI IN LIFE** activity provided on page **30**.

Encourage the students to complete the **AI DEEP THINKING** activity given on page **30**.

Take the students to the computer lab and let them practice the activity given in the **AI LAB** section on page **30** in the main course book. This will enhance their skills in creativity and technology literacy.

Suggested Activity

Encourage students to identify an issue in their own home or school that can be solved using the AI Project Cycle and create an AI project plan for it.

2

The World of Robots: Ethics, Laws and Future

Teaching Objectives

Students will learn about

- ✦ Understanding Robots
- ✦ Ethics in Robots
- ✦ Laws of Robotics
- ✦ Generations of Robots

- ✦ Real-world Robots
- ✦ The Future of Robotics

Number of Periods	
Theory	Practical
2	1

Teaching Plan

Start the class by asking students to share their thoughts on robots. Discuss how robots can be helpful, such as in cleaning or performing repetitive tasks, and how they are not alive but can think and make decisions.

Discuss the definition of robots according to the National Robotics Association: a machine that can perform tasks autonomously. Explain the parts that make up a robot, including mechanical, electrical, and sometimes electronic components.

Explain key characteristics of robots.

Discuss the advantages: high efficiency, accuracy, safety, and the ability to work in hazardous environments. Also, explain the limitations: lack of creativity, high cost, dependence on programming, and job displacement.

Explain the different generations of robots and their key characteristics.

Discuss the ethical concerns associated with robots, such as privacy, fairness, accountability, and job displacement. Emphasize the role of roboethics in guiding robot behaviour and ensuring that they are developed and used responsibly.

Explain Isaac Asimov's Three Laws of Robotics.

Discuss the use of robots in various fields.

Discuss how robots will evolve in the future, becoming smarter, more independent, and collaborative with humans. Highlight examples of future robots working in hospitals, schools, and space, and the challenges ahead like job displacement and safety concerns.

Extension

Ask the students some oral questions based on this chapter.

- Q. What are the key characteristics of a robot?
- Q. How do robots help in the healthcare and space exploration fields?
- Q. What are some ethical concerns related to robots in society?
- Q. How do the Three Laws of Robotics guide robot behaviour?
- Q. What are the advantages and limitations of robots?
- Q. How will robots impact jobs and work in the future?

Evaluation

Guide the students to complete the sections, such as **Ask AIRO** provided on page 39.

Encourage the students to solve the question in the **VISUAL VAULT** section on page **38**.

After explaining the chapter, let the students do the **ROBO CHECK** on pages **39, 40** and **41** in the main course book.

Encourage the students to complete the activity like **CASE STUDY** given on page **41**.

Suggested Activity

In groups, students will design a robot for a specific task (e.g., home cleaning, medical assistance, or space exploration). They will present their design and explain which generation of robots their model fits into, the ethics involved, and the benefits it provides.