8

DIGICODE AI

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 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.

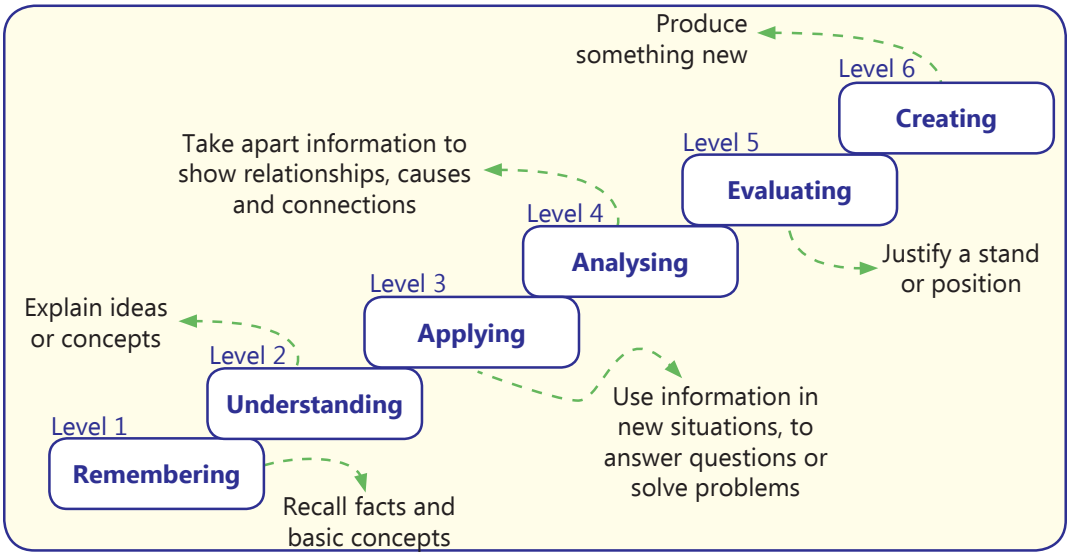
"Knowing yourself is the beginning of all wisdom."

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 8

Lesson Plan

DigiCode AI

1. Google Apps

Teaching Objectives

Students will learn about

- ☞ Google
- ☞ Apps of Google

Number of Periods	
Theory	Practical
1	2

Teaching Plan

Before starting the chapter, ask the students to solve the question in Tech Set Go given on Page 7 of the main course book.

While teaching this chapter, brief the students about Google and mobile apps.

Introduce Google to the students along with the history.

Explain the Google Apps to the students in detail like Gmail, Google Drive, Google Maps, Google Docs, Google Sheets, Google Slides and YouTube.

Explain the following components of Google Drive to the students along with the steps involved in:

- What can you store in Google Drive?
- How much can you store in Google Drive?
- How does it work?
- Features of Google Drive

Demonstrate the features of Google Maps to the students along with the steps involved in it.

Demonstrate the opening/ importing an existing word document for editing in Google Docs to the students along with the steps involved in it.

Explain the following components of Google Sheets to the students along with the steps involved in:

- Features of Google Sheets
- Creating and Saving a New Google Sheet
- Sharing and Protecting Data in Google Sheets
- Sharing a File
- Protecting Data

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Explain the following components of Google Slides to the students along with the steps involved in:

- Features of Google Slides
- Creating a New Presentation

Explain the following components of YouTube to the students along with the steps involved in:

- Features of YouTube
- How to Create YouTube Account
- Uploading a Video on YouTube

Ask the students to read the Byte Fact given on page 9 and 18.
Ask the student to solve the exercise Byte Quest given on page number 18.

Extension

Ask the students some oral questions based on this chapter.

Q. What are Google Apps?
Q. What is Gmail?
Q. What is Google Drive?
Q. What is Google Maps?
Q. What is Google Docs?
Q. What is Google Sheets?
Q. What is Google Slides?
Q. What is YouTube?

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 21 and 22 in the main course book as Tech Ready. Tell the students to solve Tech Twister activity given on page 22 of the main course book. Help the students to solve these questions

In Creative Assignment, activity like Byte Task and Go Online on page 23 of the main course book will enhance the ability of the students and serve as creativity and experiential learning.

Suggested Activity

Ask the students to create a document in Google Docs and a presentation in Google Slides on 'Environment Day'.

2. Animation in Krita

Number of Periods	
Theory	Practical
2	3

Teaching Objectives

Students will learn about

- Components of Krita
- Layers in Krita
- Using Multiple Layers
- Basic Concepts in Animation
- Creating Animated LED Lights
- Creating a New File
- Managing Layers
- Introduction to Animation
- Creating an Animation of Bouncing Ball

Teaching Plan

Before starting the chapter, ask the students to solve the question in 'Tech Set GO' given on page 24 of the main course book.

Begin with introduction of Krita as a free and open-source graphics editor.

Let them know about the components of Krita.

Make the students aware of how to create a new file in Krita.

Make the students understand that layers in Krita are transparent sheets containing objects which are stacked on top of each other so that the individual properties of an object are preserved.

Explain how to manage layers in Krita.

Also let them know how multiple layers can be used to create an image in Krita.

Explain to the students the basic concepts of Animation in Krita like Stage, Timeline, Frames and Keyframes.

Let the students know how to create an animation of bouncing ball in Krita.

Make the students aware of how to create animated LED lights in Krita.

Also teach them the steps of creating animated LED lights in Krita.

Ask the student to solve the exercise 'Take Off' given on page 39.

Ask the students to solve the exercise 'Byte Quest' given on page 29 and 35.

Ask the students to read the Byte Fact given on page 26,31 and 34.

Extension

Ask the students some oral questions based on this chapter.

Q. What is Krita?

Q. Name the components of Krita.

Q. What is the function of Tool Options Docker in Krita?

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Q. What is the function of Layers Docker in Krita?

Q. What are layers in Krita?

Q. How do layers help in editing?

Q. What is animation?

Q. Name some basic concepts of animation in Krita.

Q. What is stage in animation mode of Krita?

Q. What is timeline used for in Krita?

Q. What are frames in Krita?

Q. Define keyframes.

Evaluation

After explaining the chapter, let the students do the exercises given on page 37 and 38 in the main course book as Tech ready. Tell the students to solve Tech Twister activity given on page 38 of the main course book. Help the students to solve these questions

In Creative Assignment, activity like Byte Task and Go Online on page 39 and 40 of the main course book will enhance the ability of the students and serve as creativity and experiential learning.

Suggested Activity

Ask the students to create an animation where two cars are coming on a road from opposite directions and crash in the center.

3. Trending Technologies

Teaching Objectives

Students will learn about

- ☞ Artificial Intelligence
- ☞ Machine Learning
- ☞ Internet of Things (IoT)
- ☞ Augmented Reality and Virtual Reality
- ☞ Robotics
- ☞ Data Science
- ☞ Edge Computing
- ☞ 3D Printing

Number of Periods	
Theory	Practical
2	4

Teaching Plan

Before starting the chapter, ask the students to solve the question in 'Tech Set Go' given on page 41 of the main course book.

Begin with introduction of trending technologies as newer technologies evolving every day across the globe.

Let them know about the artificial intelligence and explain to them that AI is a part of almost everything we use today such as smartphones, cars and banks.

Make the students aware of Robotics.

Make the students understand the robotic process automation.

Explain some robots to the students.

Let them know about machine learning.

Explain to the students that data science is a field of study that combines domain expertise, programming skills and knowledge of mathematics and statistics to extract meaningful insights from data.

Make the students aware of Internet of Things (IoT).

Let them know that Edge computing is a subsection of cloud computing.

Explain the terms Augmented Reality and Virtual Reality to the students.

Also make the students aware of the process of 3D Printing.

Ask the students to solve the exercise Byte Quest given on page 44 and 46.

Ask the students to read the Byte Fact given on page 46.

Extension

Ask the students some oral questions based on this chapter.

Q. What is AI?

Q. Name some devices where AI is used.

Q. Define Robotics.

Q. What is Machine Learning?

Q. Define Data Science.

Q. Define Internet of Things (IoT).

Q. What is Edge computing?

Q. Differentiate between Augmented Reality and Virtual Reality.

Q. What is 3D printing?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 48 and 49 in the main course book as Tech Ready. Tell the students to solve Tech Twister activity given on page 50 of the main course book. Help the students to solve these questions

In Creative Assignment, activity like Byte Task and Go Online on page 51 of the main course book will enhance the ability of the students and serve as flexibility and interdisciplinary learning.

Suggested Activity

Ask the students to find some more popular robots and their details other than the ones in the book.

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4. Algorithmic Intelligence

Teaching Objectives

Students will learn about

- ☞ Multiple Conditions in a Program
- ☞ Loops in a Program

Number of Periods	
Theory	Practical
2	0

Teaching Plan

Before starting the chapter, ask the students to solve the question in Tech Set Go given on Page 53 of the main course book.

While teaching this chapter, brief the students about conditional statements.

Explain the students that IF conditions are joined together either through AND or OR.

Demonstrate the basic looping condition to the students.

Explain two types of loops:

- Counting Loop
- Conditional Loop

Ask the students to read the **Code Fact** given on page 57.

Ask the student to solve the exercise **Code Quest** given on page 55 and 56.

Extension

Ask the students some oral questions based on this chapter.

Q. What is a loop?

Q. What are conditional statements?

Q. What are counting loops?

Q. What are conditional loops?

Q. What is an infinite loop?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 57 and 58 in the main course book as **Tech Ready**. Tell the students to solve **Tech Twister** activity given on page 58 and 59 of the main course book. Help the students to solve these questions.

In creative assignment, activity like **Code Task** on page 60 of the main course book will enhance the ability of the students and serve as creativity and experiential learning.

Suggested Activity

Ask the students to create a conditional statement and write answer for it. Also, create a looping condition and write the program code with and without a loop.

5. Advanced MakeCode Arcade

Teaching Objectives

Students will learn about

- What are Control Structures?
- Understanding IF-ELSE and ELSE-IF statements
- Logical Operators
- Relational operators
- Precedence of Operators
- What Exactly are Functions?
- Function Parameters
- Returning Value from a Function
- What are Arrays?
- Sorting a List
- Sorting an Array
- Searching Elements in an Array
- What is a Sequence?
- Sequencing with Loops and Conditions

Number of Periods	
Theory	Practical
2	3

Teaching Plan

Before starting the chapter, ask the students to solve the question in Tech Set Go given on Page 61 of the main course book.

While teaching this chapter, brief the students about Advanced MakeCode Arcade.

Explain the students about control structures and three control structures as:

• Sequential • Selection/Conditional • Iteration

Demonstrate the use of IF-ELSE and ELSE-IF statement.

Ask the students about operators and tell them about various operators like logical operators and relational operators.

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Explain three most important logical operators such as:

- AND Operator
- OR Operator
- NOT Operator

Explain the students about precedence of operators.

Help them create a program to check if a number is even or odd in MakeCode Arcade.

After that, try to give a brief introduction about functions and tell the students about function parameters.

Demonstrate the student how to return values from a function.

Explain the students that array is an arrangement of objects.

Demonstrate array declaration to the students as:

arr=[10, 20, 30, 40, 50, 60];

Explain sorting to the students and how to sort a list or array.

Demonstrate how to search an element in an array.

Explain what sequence is and demonstrate how to do sequencing with loops and conditions.

Provide proper explanation to the example of sequencing with algorithm and flowchart.

Ask the students to read the **Code Fact** given on page 63, 65 and 70.

Ask the student to solve the exercise **Code Quest** given on page 63, 69, 71 and 74.

Extension

Ask the students some oral questions based on this chapter.

Q. What are control structures?

Q. What are logical operators?

Q. What is a function?

Q. What are arguments?

Q. What is an array?

Q. What are the limitations of array?

Q. What is selection sort?

Q. What is sorting?

Q. What is a sequence?

Q. Give an example of sequence.

Q. What is a bug?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 74, 75 and 76 in the main course book as **Tech Ready**. Tell the students to solve **Tech Twister** activity given on page 76 and 77 of the main course book. Help the students to solve these questions.

In creative assignment, activity like Code Task on page 78 and 79 of the main course book will enhance the ability of the students and serve as creativity and experiential learning.

Suggested Activity

Ask the students to create a program on Fibonacci series.

6. Looping Statements in Python

Teaching Objectives

Students will learn about

- ☞ The for Statement
- ☞ The jump Statements
- ☞ The while Statement
- ☞ Some More Programs

Number of Periods	
Theory	Practical
2	3

Teaching Plan

Before starting the chapter, ask the students to solve the question in Tech Set Go given on Page 83 of the main course book.

While teaching this chapter, brief the students about looping or iterative statements in Python.

Explain the students about various looping statements such as for and while.

Briefly explain about for statement using syntax as:

```
for <variable> in <iterator>:
Statements
```

Demonstrate the use of range function and explain the syntax to the students as:

range(n)

Example: range(6) is equivalent to [0, 1, 2, 3, 4, 5].

range(start, stop)

Example: range(3, 9) is equivalent to [4, 5, 6, 7, 8].

range(start, stop, step_size)

Example: range(1, 14, 2) is equivalent to [1, 3, 5, 7, 9,11,13].

Briefly explain about while statement using syntax as:

```
while (test expression):
Statements
```

Explain infinity loop to the students using an example.

Demonstrate the use of while Loop using else statement.

Explain the student various jumping statements—break and continue, which are used within the loop.

Briefly explain the syntax of break statement as:

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```
#loop statement
break
```

Briefly explain the syntax of continue statement as:

```
#loop statements
continue
#the code to be skipped
```

Demonstrate the use of looping statements in Python by some more programs.

Ask the students to read the **Code Hint** given on page 87 and 89.

Ask the student to solve the exercise **Code Quest** given on page 88.

Extension

Ask the students some oral questions based on this chapter.

Q. What are iterative statements?

Q. How many types of looping statements are there in Python?

Q. What is difference between for and while statement in Python?

Q. How to come out of an infinite loop?

Q. Which keyword in Python is used for bringing the program control out of the loop?

Q. What is the use of continue statement?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 92 and 93 in the main course book as **Tech Ready**. Tell the students to solve **Tech Twister** activity given on page 93 and 94 of the main course book. Help the students to solve these questions.

In creative assignment, activity like **Code Task** on page 94 of the main course book will enhance the ability of the students and serve as creativity and experiential learning.

Suggested Activity

Ask the students to write a program to print numbers from 1 to 50 that are divisible by 7.

7. Functions in Python

Teaching Objectives

Students will learn about

- ☞ Features of Function
- ☞ Advantages of Functions
- ☞ Creating a Function
- ☞ Some More Programs
- ☞ Components of Python Function
- ☞ Types of Functions in Python
- ☞ Calling a Function

Number of Periods	
Theory	Practical
2	3

Teaching Plan

Before starting the chapter, ask the students to solve the question in Tech Set Go given on Page 95 of the main course book.

While teaching this chapter, brief the students about functions, its features, components and advantages.

Explain different types of functions in Python such as:

• Built-In Functions • User-Defined Functions

Demonstrate how to create a function in Python.

Briefly explain the following:

- **Defining a Function:** We use the def keyword to begin the function definition.
- **Naming a Function:** Provide a meaningful name to your function.
- **Supply Parameters:** The parameters (separated by commas) are given in the parenthesis following the name of the function. These are basically the input values we pass to the function.
- **Body of the function:** The body of the function contains Python statements that make our function perform the required task. Syntax of creating a function is:

```
def < name of the function > (list of parameters)
<body>
```

Demonstrate how to call a function in Python.

Ask the students to read the **Code Hint** given on page 97.

Ask the student to solve the exercise **Code Quest** given on page 97.

Extension

Ask the students some oral questions based on this chapter.

Q. What is a function?

Q. Give any two features of function.

Q. What are the components of Python?

Q. What are arguments?

Q. Give any three advantages of using the functions.

Q. What is the difference between built-in and user-defined functions?

Q. What are supply parameters?

Q. How can we call a function in Python?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 100 and 101 in the main course book as **Tech Ready**. Tell the students to solve **Tech Twister** activity given on page 102 of the main course book. Help the students to solve these questions.

In creative assignment, activity like **Code Task** on page 102 of the main course book will enhance the ability of the students and serve as creativity and experiential learning.

Suggested Activity

Ask the students to create a program to swap two numbers using function.

8. 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 solve the question in Tech Set Go given on Page 103 of the main course book.

While teaching this chapter, brief the students about robotics.

Explain common differences between humans and robots.

Let the student understand essential parts of robots such as:

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

Explain different types of end effectors to the students.

Briefly explain about three widespread types of locomotive devices such as:

- Electric
- Hydraulic
- Pneumatic

Explain what controller is and two types of controllers that determine the robot's behaviour.

Explain how sensors play an important role in sensing position, force, temperature, etc.

Let the students understand the primary source of energy for most robots.

Ask the students to read the **AI Fact** given on page 107.

Ask the students to play the **AI GAME** given on page 108 and 109.

Ask the student to solve the exercise **AI Quest** given on page 108.

Extension

Ask the students some oral questions based on this chapter.

Q. What is robotics?

Q. Give any two difference between human and robots.

Q. Name two categories of end effectors.

Q. Name three widespread types of locomotive devices.

Q. What is manipulator?

Q. Explain two types of controller that determine the robot's behaviour.

Q. What are sensors?

Q. Which sensor is used to measure the distance of any object from a robot?

Q. Which sensor are used to detect sounds?

Q. What is the primary source of energy for most robots?

Q. Which robot use direct power?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 109 and 110 in the main course book as **Tech Ready**. Tell the students to solve **Tech Twister** activity given on page 111 of the main course book. Help the students to solve these questions.

In creative assignment, activity like **AI Task** and **Go Online** on page 111 of the main course book will enhance the ability of the students and serve as creativity and experiential learning.

Suggested Activity

Ask the students to create a chart on different parts of the robotic arm.

9. Domains of AI

Teaching Objectives

Students will learn about

- ☞ Domains of AI
- ☞ Real Life Applications of Different Domains of AI

Number of Periods	
Theory	Practical
3	1

Teaching Plan

Before starting the chapter, ask the students to solve the question in Tech Set Go given on Page 113 of the main course book.

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While teaching this chapter, brief the students about artificial intelligence and its significance.

Explain artificial intelligence as defined by Barr and Feigenbaum to the students.

Briefly explain about various methods through which we can develop artificially intelligent systems.

Explain Natural Language Processing (NLP) is a subfield of AI which helps in communication between human and computer in natural language to the students.

Let the students understand concept of big data and its usage in AI.

Explain computer vision is a very popular field of AI that trains a computer to understand and interpret the visual world.

Also define computer vision according to Fei-Fei Li.

Describe various applications of computer vision.

Explain how self-driving cars and drones are prime examples of real-time uses of computer vision.

Describe that AI encompasses a wide range of domains, each with specific real-life applications that demonstrate the versatility and transformative potential of artificial intelligence.

Let the student understand how big data helps to analyze the data, and this data includes information about consumer shopping habits, personalized marketing, fuel optimization tools, etc.

Explain how computer vision is a very important tool and it helps us in many areas.

Describe that NLP is very helpful in day-to-day life as it provides speech recognition capability to smartphones and other devices.

Give examples for each domain of AI to clarify the concepts.

Ask the students to read the **AI Fact** given on page 115 and 116.

Ask the students to play the **AI GAME** given on page 118 and 119.

Ask the student to solve the exercise **AI Quest** given on page 116.

Extension

Ask the students some oral questions based on this chapter.

Q. What is artificial intelligence?
Q. Name any two domains of AI.
Q. What is Natural Language Processing (NLP)?
Q. Give two applications of Big Data in real life.
Q. Name two technologies used in Computer Vision.
Q. What is the importance of data processing in Big Data?
Q. How does facial recognition work in security?
Q. Describe a real-life application of NLP.
Q. What is image processing in Computer Vision?
Q. Name a key technology used in Big Data analytics.
Q. How do autonomous vehicles use Computer Vision?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 119 and 120 in the main course book as **Tech Ready**. Tell the students to solve **Tech Twister** activity given on page 121 of the main course book. Help the students to solve these questions.

In creative assignment, activity like **AI Task** and **Go Online** on page 121 of the main course book will enhance the ability of the students and serve as creativity and experiential learning.

Suggested Activity

Ask students to create a chart illustrating real-life applications of each AI domain (NLP, Big Data, Computer Vision).

10. 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 solve the question in Tech Set Go given on Page 122 of the main course book.

While teaching this chapter, brief the students about the concept of sustainable development.

Introduce the 17 SDGs set by the United Nations to address global challenges.

Explain goal of each SDG as :

- **Goal 1:** Ending poverty for all.
- **Goal 2:** Ending hunger for all.
- **Goal 3:** Ensuring healthy lives and promoting well-being for all.
- **Goal 4:** Inclusive and equitable quality education and lifelong learning opportunities for all.
- **Goal 5:** Achieve gender equality and empower all girls and women.
- **Goal 6:** Availability of clean water and sanitation for all.
- **Goal 7:** Affordable, reliable and clean energy for all.
- **Goal 8:** Sustained, economic, and sustainable growth, employment, and decent work for all.
- **Goal 9:** Aims to build resilient infrastructure, inclusive industry and innovation.

- **Goal 10:** Reducing inequalities within and among countries.
- **Goal 11:** Aims at making sustainable cities and communities.
- **Goal 12:** Ensures responsible consumption and production.
- **Goal 13:** Aims to take urgent action to combat climate change and it impacts.
- **Goal 14:** Aims at conserving life below water, reduce water pollution and protect and restore ecosystems.
- **Goal 15:** Aims at conserving life on land, reduce land pollution and protect and restore ecosystems.
- **Goal 16:** Promote peace, justice, and strong institutions.
- **Goal 17:** Strengthen and revitalize the global partnerships for the goals.

Describe the role of Technology and AI to Achieve SDGs.

Applications:

- AI in Healthcare: Predictive analytics for disease outbreaks, personalized medicine.
- Big Data for Climate Action: Analyzing climate patterns, predicting natural disasters.
- NLP in Education: Language translation tools, personalized learning assistants.
- Computer Vision in Agriculture: Monitoring crop health, precision farming.

Examples:

- Healthcare: AI diagnosing diseases from medical images.
- Education: Online platforms providing accessible education to remote areas.
- Climate Action: AI models predicting weather changes and helping in disaster response.
- Agriculture: Drones using computer vision to monitor and enhance crop yields.

Ask the students to read the **AI Fact** given on page 126.

Ask the student to solve the exercise **AI Quest** given on page 126.

Extension

Ask the students some oral questions based on this chapter.

Q. What are Sustainable Development Goals (SDGs)?

Q. Name three SDGs and explain their importance.

Q. What is the aim of SDG 1?

Q. Define Goal 7.

Q. Why SDGs are introduced?

Q. Who introduced SDGs?

Q. Describe Goal 17.

Q. Which Goal help to combat climate change?

Q. What is the importance of partnerships in achieving the SDGs?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 127, 128 and 129 in the main course book as **Tech Ready**. Tell the students to solve **Tech Twister** activity given on page 129 of the main course book. Help the students to solve these questions.

In creative assignment, activity like **AI Task** and **Go Online** on page 129 and 130 of the main course book will enhance the ability of the students and serve as creativity and experiential learning.

Suggested Activity

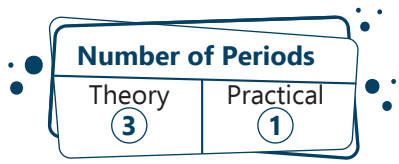
Ask the students to create a poster illustrating one of the SDGs and how AI can help achieve it.

11. Possibilities with AI

Teaching Objectives

Students will learn about

- ☞ Preferred Skills to get a Job in AI Field
- ☞ Career Opportunities in AI
- ☞ Organisations Providing AI Jobs



Teaching Plan

Before starting the chapter, ask the students to solve the question in Tech Set Go given on Page 131 of the main course book.

While teaching this chapter, brief the students about the growing importance of AI in various industries.

Discuss how AI is transforming job markets and creating new career opportunities.

Explain how AI is a rapidly evolving field with high demand for skilled professionals.

Describe the understanding of AI concepts and technologies is crucial for future job markets.

Explain the essential skills required to pursue a career in AI.

a. Soft Skills

- Data Literacy Skills
- Collaboration Skills

- Critical Thinking Skills
- Leadership Skills
- Adaptability Skills

b. Technical Skills

- Programming Languages
- Machine Learning Algorithms
- Artificial Neural Networks
- Mathematics and Algorithm
- Signal Processing Techniques

Highlight various industries impacted by the AI revolution such as:

- Healthcare
- Transportation
- Business Intelligence
- Construction
- Cybersecurity
- Manufacturing
- Information Technology
- Supply Chain Management
- Retail

Discuss various career paths and job roles within the AI field.

Let the student understand some of the most in-demand jobs in the field of AI.

- **Machine Learning Engineer:** Develops and implements machine learning models.
- **Robotics Engineer:** Designs and builds intelligent robots and automation systems.
- **Computer Vision Engineer:** Works on projects involving image and video processing.
- **Data Scientist:** Analyzes complex data to provide insights and build predictive models.
- **Aerospace Engineer:** Design and control space vehicles and robots.

Describe necessary skills required to be Machine Learning Engineer as:

- Statistics
- Deep learning, dynamic programming, neural network architectures

Describe necessary skills required to be Robotics Engineer as:

- Creative ideas
- Programming mind-set

Describe necessary skills required to be Computer Vision Engineer as:

- Classification of images
- Face detection and recognition

Describe necessary skills required to be Data Scientist as:

- Machine Learning techniques
- Data Visualisation and Reporting

Describe necessary skills required to be Aerospace Engineer as:

- Applied Mathematics
- Astrophysics

Highlight leading companies and organizations offering AI job opportunities such as Google, Amazon, Microsoft and IBM.

Explain what startup is to the students.

Describe some of the very famous AI Start-ups in India such as:

- Niramai Health Analytix
- Discover.ai
- Doxper
- Expertrons
- Haptik.ai
- Niki.ai
- Avaamo

Ask the students to read the A**I Fact** given on page 132 and 133.

Ask the student to solve the exercise **AI Quest** given on page 136 and 138.

Extension

Ask the students some oral questions based on this chapter.

Q. What programming languages are essential for AI jobs?

Q. Name three key skills needed for a career in AI.

Q. Describe the role of a data scientist.

Q. Name three tech giants that offer AI job opportunities and describe one AI project from each.

Q. What is the role of a machine learning engineer?

Q. How can soft skills benefit an AI professional?

Q. What are the differences between an robotics engineer and an aerospace engineer?

Q. What key skills are needed by a computer vision engineer?

Q. Name any four AI start-ups in India.

Evaluation

After explaining the chapter, let the students do the exercises given on pages 138 and 139 in the main course book as **Tech Ready**. Tell the students to solve **Tech Twister** activity given on page 140 of the main course book. Help the students to solve these questions.

In creative assignment, activity like **AI Task** on page 140 of the main course book will enhance the ability of the students and serve as creativity and experiential learning.

Suggested Activity

Ask the students to create a presentation on a specific AI career, detailing the required skills, job responsibilities, and potential employers.

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