TOUCHPAD

Web Application (Ver. 2.0)

12

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."

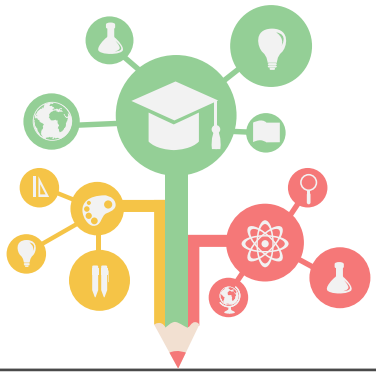
Age 9 - 11 Years	
Physical	• Motor skills develop resulting in enhanced reflexes
Cognitive	• Applies several memory strategies at once • Cognitive self-regulation is now improved
Language	• Ability to use complex grammatical constructions enhances • Conversational strategies are now more refined
Emotional/ 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.

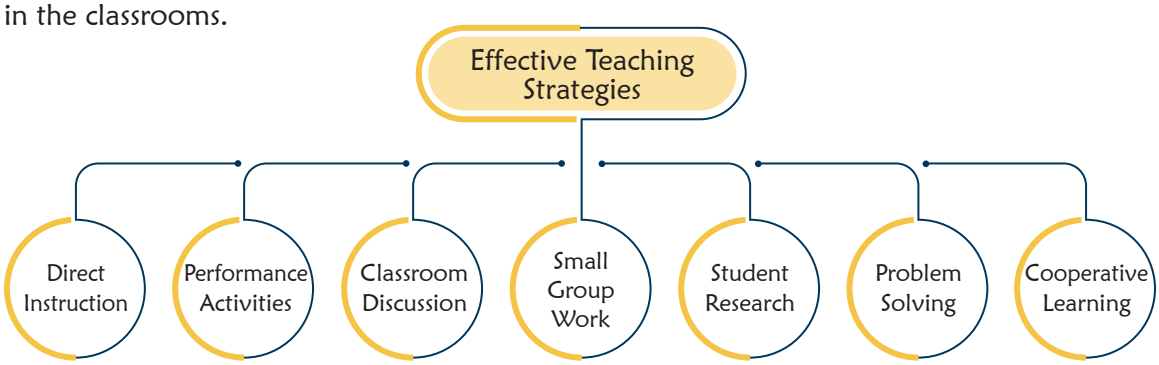
After the class

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

"Knowing yourself is the beginning of all wisdom."

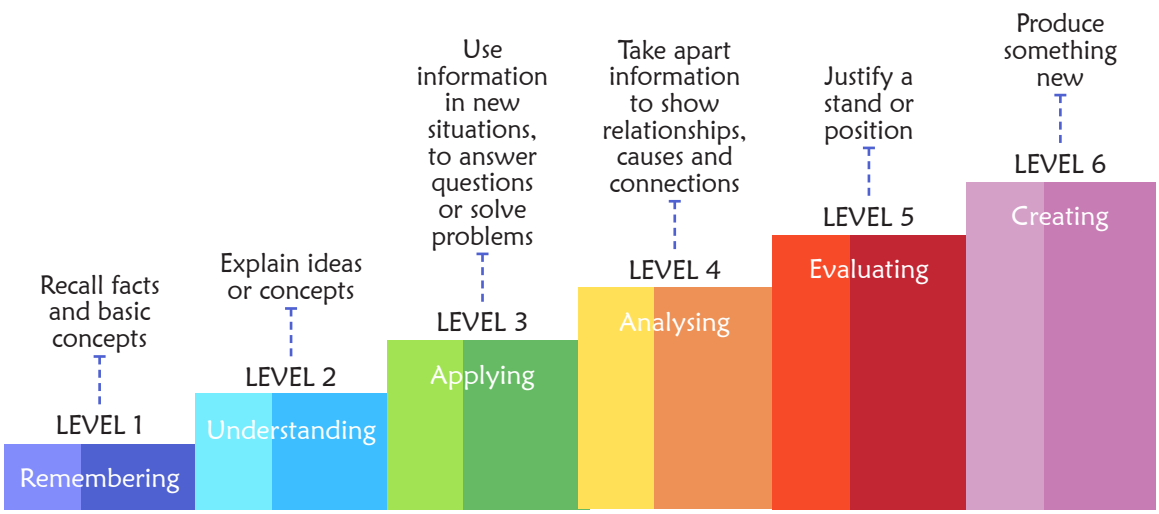
Teaching Strategies

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 12

LESSON PLAN

Part-A: Employability Skills

1 Communication Skills-IV

Teaching Objectives

By the end of this unit, students will be able to:

- Understand the basics and process of communication.
- Identify and apply principles of effective and active listening.
- Recognise parts of speech and their roles in sentence formation.
- Construct grammatically correct sentences and coherent paragraphs.
- Differentiate sentence types (simple, compound, complex; active/passive; declarative/interrogative/etc.).
- Apply the RESPECT model to improve active listening and communication.

Number of Periods	
Theory	Practical
4	2

Teaching Plan

Introduction (Engagement)

Interactive Warm-up Questions:

- What is the difference between speaking and communicating?
- Can listening skills impact how well we understand someone?
- Have you ever misinterpreted a message? Why do you think that happened?

Engagement Activity:

- "Broken Telephone" game: Whisper a sentence around the class. Discuss how the message changed and what affected communication.

Lesson Delivery (Explanation & Demonstration)

1. Understanding Communication

Concepts:

- Definition of communication as a two-way process.
- Elements: Sender, Receiver, Channel, Encoding, Decoding, Feedback.

Demonstration:

- Diagrammatic explanation of the communication cycle.

Activity:

- Role-play exercise: Students act as sender/receiver pairs to deliver a message and provide feedback.

2. **Active Listening & RESPECT Model**

Concepts:

- Importance of listening in communication.
- Five phases: Receiving, Understanding, Remembering, Evaluating, Responding.
- RESPECT acronym (Remove, Eye Contact, Show attention, Pay attention, Empathise, Clarify, Tune-in).

Activity:

- **RESPECT Poster Creation:** Small groups make posters explaining each component of RESPECT.

Discussion:

- Share real-life scenarios where listening changed an outcome (school, home, etc.).

3. **Overcoming Listening Barriers**

Concepts:

- Types of barriers: being preoccupied, distractions, mindset biases, personal considerations.
- Strategies to overcome: mindfulness, suitable environment, empathy.

Group Discussion:

- Think-pair-share: Identify a common barrier in a specific scenario (e.g., noisy classroom, family dinner) and how to overcome it.

4. **Parts of Speech and Sentence Formation**

Concepts:

- Basic parts: Noun, Pronoun, Verb, Adjective, Adverb.
- Supporting parts: Article, Preposition, Conjunction, Interjection.

Activity:

- Sentence building game: Students pick a part of speech card and collaboratively build meaningful sentences.

5. **Sentence Structure & Types**

Concepts:

- Types: Simple, Compound, Complex.
- Voice: Active and Passive.
- Purpose-based types: Declarative, Interrogative, Imperative, Exclamatory.

Activity:

- Sort & Classify: Provide sentences. Students classify them into the right categories.

Worksheet:

- Convert active to passive and vice versa.

6. Paragraph Writing

Concepts:

- Structure: Topic sentence, Supporting sentences, Concluding sentence.
- Importance of coherence and unity.

Activity:

- Write a paragraph titled "My Favourite Day at School" using proper paragraph structure.

Extension

- Why is feedback important even in daily conversations?
- Can a message still be misunderstood even if the speaker uses clear words? Why?
- How does your body language affect your communication?
- Why do we need to focus on sentence structure when speaking or writing?
- What do you understand by "barriers to active listening"? Can you give one example from your life?

Evaluation

- Multiple-choice, True/False, and Fill-in-the-blanks based on communication, RESPECT model, sentence types, and punctuation.

Practical Tasks:

- Pair Activity: Practice a conversation using gestures, feedback, and RESPECT.
- Paragraph Writing: Evaluate grammar, punctuation, and clarity.

Suggested Activity

"Design Your School Campaign" Project:

- Create posters showing how to use RESPECT in real-life conversations (e.g., Teacher-student, Parent-child).
- Role-play showing a conversation where a barrier causes miscommunication, then re-enact showing how to overcome it.

2 Self-Management Skills-IV

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- Construct grammatically correct sentences and coherent paragraphs.

- Differentiate sentence types (simple, compound, complex; active/passive; declarative/interrogative/etc.).
- Apply the RESPECT model to improve active listening and communication.

Number of Periods	
Theory	Practical
4	2

Teaching Plan

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Interactive Warm-up Questions:

- What is the difference between speaking and communicating?
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- Have you ever misinterpreted a message? Why do you think that happened?

Engagement Activity:

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Lesson Delivery (Explanation & Demonstration)

1. **Understanding Communication**

   Concepts:

   - Definition of communication as a two-way process.
   - Elements: Sender, Receiver, Channel, Encoding, Decoding, Feedback.

   Demonstration:

   - Diagrammatic explanation of the communication cycle.

   Activity:

   - Role-play exercise: Students act as sender/receiver pairs to deliver a message and provide feedback.

2. **Active Listening & RESPECT Model**

   Concepts:

   - Importance of listening in communication.
   - Five phases: Receiving, Understanding, Remembering, Evaluating, Responding.
   - RESPECT acronym (Remove, Eye Contact, Show attention, Pay attention, Empathise, Clarify, Tune-in).

   Activity:

   - **RESPECT Poster Creation:** Small groups make posters explaining each component of RESPECT.

   Discussion:

   - Share real-life scenarios where listening changed an outcome (school, home, etc.).

3. **Overcoming Listening Barriers**

Concepts:

- Types of barriers: being preoccupied, distractions, mindset biases, personal considerations.
- Strategies to overcome: mindfulness, suitable environment, empathy.

Group Discussion:

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Worksheet:

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6. **Paragraph Writing**

Concepts:

- Structure: Topic sentence, Supporting sentences, Concluding sentence.
- Importance of coherence and unity.

Activity:

- Write a paragraph titled "My Favourite Day at School" using proper paragraph structure.

Extension

- Can motivation come from within? Can you give an example?
- How do you feel when you achieve a goal?
- What is the most stressful situation you have faced and how did you handle it?
- Why is it important to write down our goals?

- What are some things that help you stay positive when you are upset?
- How does personality affect the way you make friends?
- What is the difference between being shy and being introverted?
- Why is journaling useful in understanding ourselves?
- What does "SMART" stand for in goal-setting? Can you give an example?
- How does stress affect your health and relationships?

Evaluation

- Multiple-choice, True/False, Fill in the blanks based on types of motivation, SMART goal setting, stress management strategies, and personality traits.
- Write a paragraph explaining how you manage stress.
- Describe a SMART goal and explain why it's realistic.

Practical Tasks:

- Prepare a poster on: "My SMART Goal Plan".
- Group role-play: Practice "positive self-talk" in a stressful situation.

Suggested Activity

- Write 5 words that best describe your personality and one goal you want to achieve.
- Students perform a skit showing how to manage stress positively using techniques discussed.
- **Design** a poster showing how they plan to achieve one SMART goal.

3 ICT Skills-IV

Teaching Objectives

By the end of this unit, students will be able to:

- Understand the concept and structure of spreadsheets and presentation software.
- Perform basic operations in LibreOffice Calc such as entering data, formulas, and functions.
- Use advanced spreadsheet features like sorting, filtering, and formatting.
- Create and edit digital presentations using LibreOffice Impress.
- Insert images, text, and graphical elements into slides and save/export presentations.

Number of Periods	
Theory	Practical
5	3

Teaching Plan

Introduction (Engagement)

Discussion Starters:

- Have you ever seen your parents using Excel or Google Sheets? What do you think it's for?

- Can digital presentations help make your school projects more impressive?

Activity:

- Show a short demo of a spreadsheet (rows, columns, active cell) and a presentation slide (with text and images) to introduce the difference between the two tools.

Lesson Delivery (Explanation & Demonstration)

1. Introduction to Spreadsheets and Calc Interface

Concepts:

- Spreadsheet definition
- Rows, columns, cells, cell address, and active cell
- Components of LibreOffice Calc (Menu bar, Toolbars, Sidebar, Formula Bar)

Activity:

- Open LibreOffice Calc and identify components
- Explore what happens when data is entered in different types (text, numbers, date)

2. Performing Basic Operations in Calc

Concepts:

- Entering, editing, deleting data
- Selecting and working with cells
- Saving and opening spreadsheets

Activity:

- Create a simple student mark list
- Enter and edit formulas such as `=A1+B1, =SUM(A1:A5)`

3. Functions and Data Manipulation

Concepts:

- Use of SUM, AVERAGE, MAX, MIN, COUNT
- Logical Functions (IF, AND, OR)
- Use of Formula bar, Fill Handle

Activity:

- Calculate total, average, and highest marks using functions
- Auto-fill a number series
- Use fill handle to apply formula

4. Formatting and Advanced Features in Calc

Concepts:

- Formatting cells: font, alignment, colour
- Sorting and Filtering data
- Password protection in spreadsheet

Activity:

- Format the student data sheet (headings bold, change colours)

- Sort students by marks
- Apply filters to view only a specific section

5. **Introduction to Presentation Software**

   Concepts:

   - Features and advantages of presentation software
   - Interface of LibreOffice Impress
   - Creating and saving a presentation

   Activity:

   - Create a 3-slide presentation on "My Favourite Festival"
     - Slide 1: Title
     - Slide 2: Text and Image
     - Slide 3: Graphic Shape and summary

6. **Enhancing Presentations with Formatting & Graphics**

   Concepts:

   - Adding slides, text, images, shapes
   - Aligning and formatting text
   - Inserting images from files and gallery

   Activity:

   - Add bullet points, align text, and insert an image on a slide
   - Draw a shape (sun or star) and use colour fill

Extension

- What is the difference between a cell and a worksheet?
- Which function would you use to find the highest value?
- What does the = sign indicate in a spreadsheet?
- How do we insert a new slide in LibreOffice Impress?
- Can you name two advantages of using presentation software?
- Why is it important to save a file in different formats?
- What is the shortcut key for printing in Calc?
- What are the uses of filters in a spreadsheet?
- What happens when you use the fill handle?
- What is the difference between SUM and AVERAGE functions?

Evaluation

- Based on rows, columns, formulas, Calc functions, Impress shortcuts, and text formatting.
- Explain how to apply a formula in a spreadsheet.

- Describe the steps to insert and format an image in a presentation.

Practical Tasks:

- Create a spreadsheet showing marks of 5 students and use functions (SUM, AVERAGE).
- Create a 3-slide presentation and format text with colours and alignments.
- Prepare a digital mark sheet for your class using Calc.
- Create a presentation titled "My Role Model" using Impress with 3 slides (Text, Image, Summary).

Suggested Activity

Design a report card, enter marks, and calculate total and average using formulas.

Students in groups create a presentation on a tech topic using LibreOffice Impress (e.g., "Benefits of Internet").

Use Insert → Function Wizard to explore and apply different functions (Mathematical/Statistical).

4 Entrepreneurial Skills-IV

Teaching Objectives

By the end of this unit, students will be able to:

- Define the concepts of entrepreneur and entrepreneurship.
- Describe the qualities and functions of a successful entrepreneur.
- Understand different types of entrepreneurs and startups.
- Identify motivational factors and entrepreneurial attitudes.
- Apply entrepreneurial competencies such as initiative, decision-making, and team-building.
- Reflect on real-life entrepreneurial journeys and develop perseverance.

Number of Periods	
Theory	Practical
5	2

Teaching Plan

Introduction (Engagement)

Warm-up Questions:

- What do you think makes someone an entrepreneur?
- Have you ever thought of a business idea to solve a problem around you?
- Can a student be an entrepreneur? How?

Starter Activity:

- Share a short video or real-life story of an inspiring young entrepreneur (e.g., Pooja's or Anuj's journey from the chapter) and have students share what inspired them.

Lesson Delivery (Explanation & Demonstration)

1. **Entrepreneur and Entrepreneurship**

   Concepts:

   - Definitions from various perspectives: economic, psychological, sociological, management.
   - Characteristics: Economic activity, risk-taking, resource optimisation, and opportunity identification.

   Activity:

   - Students write their own one-line definition of an entrepreneur.
   - Role-play as different types of entrepreneurs (service, industrial, agricultural, etc.)

2. **Qualities and Functions of an Entrepreneur**

   Concepts:

   - Key qualities: initiative, hard work, motivation, risk-taking, decision-making, etc.
   - Functions: identifying opportunities, putting ideas into action, resourcing, managing the business.

   Activity:

   - "Match the Function" game – match tasks to entrepreneurial functions.
   - Group discussion on the importance of perseverance using Shruti's story.

3. **Types of Entrepreneurs and Startups**

   Concepts:

   - Types: Social, Professional, Women, Technical, Non-technical, IT, etc.
   - Characteristics of startups and the role of Startup India.

   Activity:

   - Create a collage or mind map of different entrepreneurs.
   - Compare small businesses vs. startups using a Venn diagram.

4. **Entrepreneurial Attitudes and Competencies**

   Concepts:

   - Competencies: decisiveness, initiative, stress management, goal-setting, creativity.
   - Attitudes: optimism, perseverance, interpersonal skills.

   Activity:

   - Read Rachna, Sunny, and Sonia's stories. Identify traits shown.
   - Chart activity: "My Entrepreneurial Strengths" – students reflect and list their 3 top traits.

Extension

- What makes a good business idea?
- Why is it important to learn from failure?
- What do you understand by the term "initiative"?

- What is one challenge faced by startups?
- How do social entrepreneurs differ from business entrepreneurs?
- Why is team-building important for business success?
- What is the difference between a wage employee and an entrepreneur?
- Can you name a woman entrepreneur who inspires you? Why?
- What is a startup? Can you give an example from India?
- What role does self-confidence play in starting a business?

Evaluation

- MCQs, Fill in the blanks, and True/False based on entrepreneurial functions, types, and qualities.
- Short & Long answer questions, Competency-based questions as well as case study on Entrepreneurs.

Suggested Activity

- Do a debate on "Are entrepreneurs born or made?": Divide class into two teams, one supporting "born" and the other "made".
- Students create a 3-slide presentation on an Indian entrepreneur (e.g., Suriya Prabha of Youcode) using storytelling and visuals.

5 Green Skills-IV

Teaching Objectives

By the end of this lesson, students will be able to:

- Understand the meaning and importance of green skills and green jobs.
- Identify green jobs in various sectors such as agriculture, transportation, construction, and energy.
- Recognise the significance of sustainability, ecosystem preservation, and climate change adaptation.
- Explain how individuals and industries can reduce waste, conserve resources, and minimise environmental damage.
- Reflect on how green jobs contribute to a greener economy and a healthier planet.

Number of Periods	
Theory	Practical
4	2

Teaching Plan

Introduction (Engagement)

Warm-up Discussion:

- Ask: What does "going green" mean to you?

- Have students share examples of eco-friendly actions they do at home (e.g., using cloth bags, planting trees).

Starter Activity:

- Show images of solar panels, green buildings, and electric vehicles and ask students to guess what these have in common (they all relate to green jobs).

Lesson Delivery (Explanation & Demonstration)

1. Introduction to Green Skills and Environmental Protection

Concepts:

- Definition of green skills.
- Need for sustainability due to climate change and pollution.
- Simple steps to protect the environment.

Activity:

- Group brainstorming: Make a list of 10 everyday activities that can help protect the environment.

2. Green Jobs and Their Importance

Concepts:

- Definition of green jobs and green-collar workers.
- Role of green jobs in different sectors: agriculture, construction, energy, ecotourism, solid waste management.
- Benefits: long-term employment, reduced pollution, innovation, sustainability.

Activity:

- Watch the recommended video: "***Green Jobs: The Key to Sustainable Development***"
- Discuss: What are some green jobs that interest you?

3. Green Careers in Diverse Fields

Concepts:

- Green roles in agriculture, water conservation, solar/wind energy, building, tourism, and technology.
- Importance of Krishi Vigyan Kendras (KVKs), FPOs, electric mobility, and ecotourism.

Activity:

- Create a mind map titled "Green Jobs Around Us."
- Match-the-sector game: Match a green job to its industry.

4. Benefits of Green Jobs and Climate Action

Concepts:

- Green jobs reduce greenhouse gases, support ecosystem restoration, and offer climate change solutions.
- Role of National Action Plan on Climate Change (NAPCC).
- Concepts of afforestation, waste reduction, carbon capture, and sustainable materials.

Activity:

- Debate: "Are green jobs the future of employment?"
- Reflection writing: "How can I contribute to a greener planet?"

Extension

- What is a green-collar worker?
- Name any two eco-friendly materials used in green buildings.
- How do solar panels help reduce environmental pollution?
- Why is drip irrigation considered a green job?
- What role do green jobs play in ecotourism?
- Can reusing old clothes be considered a green practice? How?
- What is the role of the Skill Council for Green Jobs?
- Why is e-waste management important?
- What are the advantages of using electric vehicles over petrol vehicles?
- What does the National Action Plan on Climate Change aim to achieve?

Evaluation

- MCQs, Fill in the blanks, and True/False based on green job definitions, sectors, and benefits.
- Short & Long answer questions as well as competency-based questions.

Practical Tasks:

- Poster: "My Dream Green Job"
- Group Activity: Design a small green business idea and present how it helps the environment.

Suggested Activity

- Plant trees in the school/local area and learn about tree care.
- Groups create posters showing various green jobs and their importance.
- Students design a product (like bamboo toothbrush or solar lamp) and explain its environmental benefit.

CLASS 12

LESSON PLAN

Part B-Subject Specific Skills

1 Emerging Trends

Teaching Objectives

By the end of this lesson, students will be able to:

- Understand and explain key emerging technologies like IoT, AI, ML, Cloud and Edge Computing.
- Differentiate between consumer IoT and IIoT.
- Identify the functions and types of Operating Systems.
- Understand cloud computing services, types, and smart storage solutions.
- Compare cloud computing with edge computing.
- Explain the fundamentals and applications of Artificial Intelligence and Machine Learning.
- Explore digital marketing and social media etiquettes with a focus on safe digital behaviour.
- Apply knowledge of digital trends to real-world examples and case studies.

Number of Periods	
Theory	Practical
8	4

Teaching Plan

Introduction (Engagement)

Engagement Questions:

- Can a refrigerator suggest recipes?
- Have you seen ads pop up related to what you searched earlier?
- What happens to your data when you upload it to Google Drive?

Demo:

- Show a smart home video or AI chatbot in action to set the context..

Lesson Delivery (Explanation & Demonstration)

1. **Internet of Things (IoT)**
   - Definition, devices, and real-world examples
   - Growth in India (Smart Cities, Healthcare, Agriculture)
   - Factors: Automation, Big Data, 5G, AI

   Activity: Ask students to list 5 IoT devices they use or see around.

2. **IIoT and Consumer IoT**
   - IIoT in manufacturing, healthcare, energy
   - Case: Indian Railways using sensors

   Diagram Task:
   - Draw a table comparing Consumer IoT vs IIoT.
3. **Operating System (OS)**
   - OS as a system software
   - **Functions:** Process, Memory, Device, File Management, Security
   - **Types:** Batch, Real-Time, Distributed, Mobile, Embedded, Multi-User

   Activity: Students match functions with OS types using daily devices.
4. **Cloud and Edge Computing**
   - **Cloud:** Definition, types (Public, Private, Hybrid, Community)
   - **Services:** IaaS, PaaS, SaaS
   - **Providers:** Google Drive, Dropbox, OneDrive
   - **Edge:** Definition, benefit for real-time apps

   Activity: Roleplay: Cloud vs Edge data flow using classroom layout
5. **Artificial Intelligence (AI)**
   - **Definition and types:** Narrow, General, Super AI
   - **Applications:** NLP, Healthcare, Robotics, Smart Homes, Education
   - **Task:**

     Classify each AI example as Narrow or potential General AI.
6. **Machine Learning (ML)**
   - **Definition and types:** Supervised, Unsupervised, Reinforcement
   - **Applications:** Finance, E-commerce, Social Media, Gaming

   Activity: Group task: Match industry problems to ML type
7. **Digital Marketing and Careers**
   - **Digital channels:** SEO, email, social media
   - **Career roles:** Analyst, Copywriter, SEO Specialist, Graphic Designer

   Creative Task:
   - Students design a mock digital ad for a product using Canva or Google Slides
8. **Social Media Etiquettes**
   - Think Before You Post (T.H.I.N.K)
   - Avoid cyberbullying, spamming, and sharing without consent

   Video Discussion:
   - Watch UNICEF Cyberbullying video and reflect on learnings

Extension (Further Exploration)

1. What is the function of an OS in a smartphone?
2. What makes Edge Computing faster than Cloud?
3. How is AI used in Netflix or Amazon?
4. Give one example of IIoT used in Indian industries.
5. Why is it dangerous to spread rumours on social media?

Creative Tasks:

- Poster on "Safe & Smart Online Behaviour"
- Design a 3-slide pitch: "How IoT can improve your city"

Evaluation (Assessments & Review)

Ask the students to do:

- MCQs and Fill in the blanks based on definitions, devices, services, OS types, and ethics.
- Short & Long answer questions as well as competency-based question from the back exercise.

Suggested Activity

- Each group presents one trend: IoT, AI/ML, Cloud, Digital Marketing or OS.
- Include: definition, working, real use case, benefit, visual demo.

2 JavaScript—Part 2

Teaching Objectives

By the end of this lesson, students will be able to:

- Understand the basic structure of a JavaScript program and apply write() and writeln() methods.
- Interact with HTML using the Document Object Model (DOM).
- Differentiate between JavaScript data types (primitive and non-primitive).
- Use JavaScript statements, literals, variables, operators, and expressions.
- Create and invoke different types of JavaScript functions including named, anonymous, and constructor functions.
- Understand object-oriented concepts and use JavaScript objects.
- Work with string methods, arrays, math methods, and handle JavaScript events.

Number of Periods	
Theory	Practical
8	5

Teaching Plan

Introduction (Engagement & Recap)

1. **Introduction (Engagement)**

   Discussion Starters:

   - What happens when you click a button and it shows a pop-up?
   - Can you display today's date or your name dynamically on a web page?

   Activity: Display a message using document.write() and compare it with alert() box output.

Lesson Delivery (Explanation & Demonstration)

1. **Structure of a JavaScript Program**
   - Internal vs. External JS, <script> tag placement
   - write() vs writeln() for output

   Hands-On: Create a webpage with both internal and external scripts.
2. **Interacting with HTML (DOM)**
   - getElementById, querySelector, innerHTML, style, createElement, appendChild

   Lab Task: Add buttons that change text or add elements dynamically on click.
3. **JavaScript Data Types**
   - Primitive: Number, String, Boolean, Null, Undefined, Symbol, BigInt
   - Non-Primitive: Object, Array, Function, Date, RegExp

   Demo: Print type of each value using typeof operator.
4. **Statements and Literals**
   - Variable declaration: var, let, const
   - Naming conventions, initialisation
   - String, number, boolean, array, object literals
5. **Operators and Expressions**
   - Arithmetic, Assignment, Comparison, Logical, Bitwise, Ternary
   - typeof operator
   - Evaluate expressions and show output with document.write()

   Lab: Use assignment and arithmetic operators to solve maths expressions.
6. **JavaScript Functions**
   - Syntax, function call, return value
   - Built-in functions: parseInt(), parseFloat(), isNaN(), alert(), prompt(), confirm()
   - User-defined: Named, Anonymous, Constructor, Inner function

   Hands-On: Create a calculator for sum, square, and cube using user-defined functions.

7. **Objects in JavaScript**
   - Creating objects: literal, constructor, new Object()
   - Accessing/updating/deleting properties and methods

   Demo: Create a student object and display its details with document.write().
8. **Strings and Methods**
   - length, slice(), substring(), replace(), match(), toUpperCase(), charAt(), trim()

   Task: Extract characters, count length, and replace part of a sentence using string methods.
9. **Arrays and Methods**
   - Creating arrays
   - Methods: push(), pop(), sort(), length, reverse(), join()

   Lab: Store 5 marks in an array, find highest, lowest, and average using JS.
10. **JavaScript Events**
   - Event handling using onclick, onmouseover, onchange
   - Add interactivity to HTML forms

   Project Task: Create a form that shows pop-up on submission using onclick and alert().

Extension (Further Exploration)

1. What is the purpose of typeof in JavaScript?
2. How is const different from let and var?
3. What are the uses of prompt and confirm boxes?
4. Explain object creation using constructor function.
5. How do you delete a property from an object?

Creative Task:

- Create an object for a car, with methods to update and display details.
- Write a quiz app that accepts answers and gives feedback using JavaScript functions.

Evaluation (Assessments & Review)

Ask the students to do:

- MCQs and Fill in the Blanks on data types, objects, functions, and methods.
- Short & Long answer questions as well as competency-based question from the back exercise.
- Lab Assessment: Write a function to accept 3 numbers and find the largest

Suggested Activity

JavaScript Application Showcase:

- **Create a webpage that includes:**
  - An interactive form using prompt and alert

- A styled paragraph using DOM
- A real-time calculator using JS functions

3 Graphic Designing using Canva and Adobe Express

Teaching Objectives

By the end of this lesson, students will be able to:

- Understand the importance of graphic design in various fields.
- Explore Canva as a powerful, easy-to-use graphic designing tool.
- Learn Canva's interface including editor, object panel, toolbars, and features.
- Create posters, presentations, and videos using Canva templates or from scratch.
- Edit text, images, and videos using Canva's built-in tools.
- Apply animations, audio, transitions, and export designs in different formats.
- Use Canva's AI tools such as Magic Write, Magic Eraser, and AI Music Generator for creative content generation.

Number of Periods	
Theory	Practical
6	5

Teaching Plan

Introduction (Engagement)

1. **Discussion Questions:**
   - Have you ever made a digital poster or a presentation?
   - What kind of designs catch your attention on social media or websites?

   Demo: Show a sample Canva design – a video or poster – and discuss how it communicates its message effectively.

Lesson Delivery (Explanation & Demonstration)

1. **Introduction to Graphic Design**
   - Definition, importance, and real-world applications (marketing, education, branding, entertainment)
   - Elements of Design: Line, Shape, Colour, Texture, Space, Size, Typography
   - Principles: Balance, Contrast, Alignment, Repetition, Proximity, Emphasis, Harmony

   Task: Students observe two sample designs and list which principles and elements they can identify.
2. **Getting Started with Canva**
   - Signing up and logging in
   - Dashboard overview and Canva Editor Interface (Header, Canvas, Timeline, Footer)
   - Object Panel: Design, Elements, Text, Uploads, Apps

   Activity: Create a new Canva account, explore the interface and upload an image.

3. **Creating a Poster Using a Template**
   - Search and select a poster template
   - Customise background, text, images, and add design elements

   Hands-On Task: Design a poster on "Internet Safety" or "Environmental Awareness" using Canva templates.
4. **Creating a Presentation in Canva**
   - Use blank or pre-designed templates
   - Add new slides, animations, transitions
   - Insert elements and audio

   Activity: Create a 5-slide presentation on "Cyber Etiquettes" with transitions and animations.
5. Creating and Editing Videos in Canva
   - Using templates or starting from scratch
   - Add video clips, split, trim, cut
   - Add audio, text, transitions, and export the final video

   Lab Task: Create a 1-minute promotional video for a fictional school event.
6. **Canva AI Features**
   - Magic Write: Generate creative text
   - Magic Eraser: Remove image objects
   - Magic Media: Create AI-generated visuals
   - Magic Animate, Magic Grab, AI Music Generator

   Demo: Use Magic Write to create social media captions; use AI Music Generator to add background music to video.
7. **Sharing and Downloading Designs**
   - Share via email or link with permissions
   - Download in different formats: PNG, PDF, PPTX, MP4
   - Print with Canva or export for other uses

Extension (Further Exploration)

Oral Questions:

1. What are the principles of a good design?
2. How can Canva be used in business promotion?
3. What's the difference between a template and a blank canvas?
4. Name two AI tools available in Canva.
5. Why is high-quality imagery important in design?

Creative Tasks:

- Create an animated poster using Canva
- Make an invitation video card using images, text, and audio

Evaluation (Assessments & Review)

Objective Questions:

- MCQs and fill in the blanks on Canva and Adobe interface, AI tools, and file formats.
- Short & Long answer questions as well as competency-based question from the back exercise.
- Preform lab activity given in the end of lesson.

Suggested Activity

Design Showcase Project

- Students create a digital project on any one topic:
  - Environment Day Poster
  - School Event Video Invitation
  - Canva-based Resume
- Present it in class explaining the design process.

4 Cyber Safety and Security

Teaching Objectives

By the end of this lesson, students will be able to:

- Distinguish between cyber safety and cybersecurity with practical examples.
- Understand the significance of digital footprints and responsible online behaviour.
- Recognise the importance of data privacy and data security in the digital world.
- Learn and apply common cybersecurity measures.
- Identify and explain intellectual property rights and plagiarism.
- Define cybercrime and categorise various types (e.g., phishing, identity theft).
- Familiarise with Indian cyber laws including IT Act 2000 and recent amendments.

Number of Periods	
Theory	Practical
7	3

Teaching Plan

Introduction (Engagement)

Starter Questions:

- Have you ever received a suspicious email or pop-up?
- Do you think your social media posts can affect your future career or admission?

Hook Activity: Show a video (e.g. "Digital Footprint" YouTube link from the chapter) and ask: "What does your online behaviour say about you?"

Lesson Delivery (Explanation & Demonstration)

1. **Introduction to Cyber Safety vs Cybersecurity**
   - Cyber Safety: Smart and respectful online behaviour

- Cybersecurity: Technical tools to protect devices and data (e.g. firewalls, antivirus)

Analogy:

Your smartphone:

Cybersecurity = Locking it with a password

Cyber Safety = Not sharing it with strangers

2. **Digital Footprints**
   - **Active:** What you share (posts, emails, forms)
   - **Passive:** What's collected automatically (IP, location, cookies)

   Case Study: Anaya's story shows how your social media behaviour can affect scholarship opportunities.
3. **Data Privacy and Data Security**
   - **Privacy:** Managing how your personal data is collected, used, and shared.
   - **Security:** Protecting that data from unauthorised access.

   Real Examples:
   - RailYatri breach
   - LinkedIn leak
   - Haldiram's ransomware case
4. **Security Measures**
   - Strong Passwords
   - Two-Factor Authentication (2FA)
   - Antivirus and Firewalls
   - Safe Browsing and Email Safety
   - Data Backup and Privacy Settings

   Hands-on Task: Create a checklist of good digital hygiene practices.
5. **Intellectual Property and Plagiarism**
   - **Types of IPR:** Copyright, Trademark, Patent
   - **Examples:** Software, books, logos, slogans
   - **Forms of Plagiarism:** Direct, Paraphrasing, Mosaic, Inappropriate citation, Accidental
   - **Tools:** Copyleaks, Grammarly, Quetext, Duplichecker

   Task: Paraphrase a paragraph and cite the source correctly.
6. **Cybercrimes and Their Types**
   - Cyberbullying
   - Identity Theft
   - Phishing

- Email Spoofing
- Cyberstalking
- Malware, Ransomware, Hacking
- DoS Attacks
- Data Breaches

Case Study:

- Air India breach (2021)
- Oil India ransomware attack (2022)

7. **Cyber Laws in India**
   - IT Act, 2000 and amendments (Sections 65–74)
   - PDP Bill (2019)
   - Bharatiya Nyaya Sanhita (BNS) 2023
   - CERT-In and MeitY

   Legal Example: Yahoo v. Akash Arora – India's first cybercrime case (1999)

Extension Activity

1. What's the difference between plagiarism and copyright violation?
2. How can you protect yourself from identity theft online?
3. Why is it important to know about cyber laws?
4. What does the BNS 2023 replace?
5. Give two examples of cybercrimes that affect individuals and organisations.

Creative Task:

- Design a digital poster: "Cyber Safety Rules for Teenagers"
- Simulate a phishing scam in a classroom game and discuss prevention

Evaluation

- MCQs and Fill in the blanks based on digital footprints, security tools, cybercrime types
- Short & Long answer questions as well as competency-based question from the back exercise.
- Preform lab activity given in the end of lesson.

Suggested Activity

- Create posters, videos, or presentations on cyber safety practices
- Use Canva or GIMP to create campaign materials
- Submit as group project to promote awareness in school