TOUCHPAD

Information Technology (V5.0)

6

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."

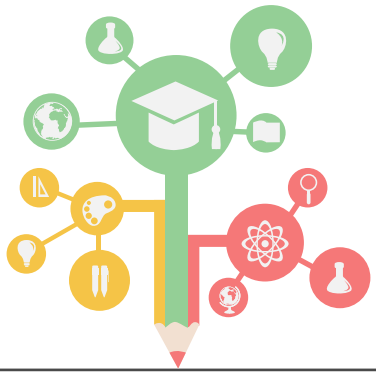
Age 9 - 11 Years	
Physical	• Motor skills develop resulting in enhanced reflexes
Cognitive	• Applies several memory strategies at once • Cognitive self-regulation is now improved
Language	• Ability to use complex grammatical constructions enhances • Conversational strategies are now more refined
Emotional/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

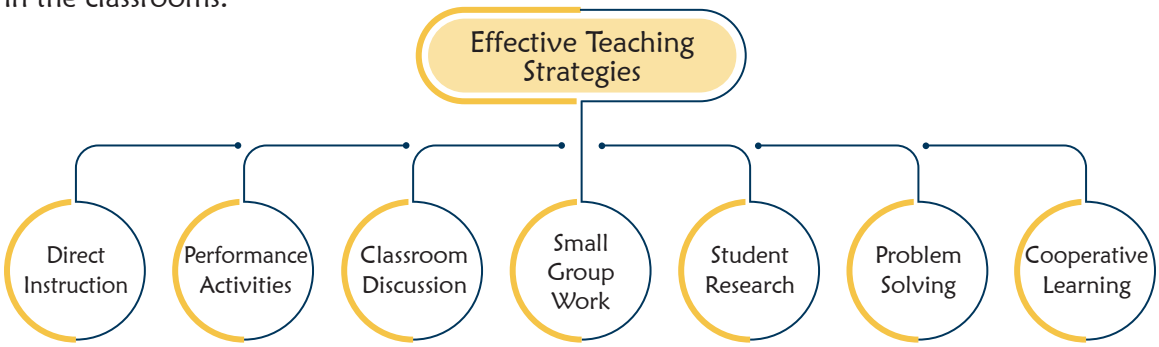
After the class

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

"Knowing yourself is the beginning of all wisdom."

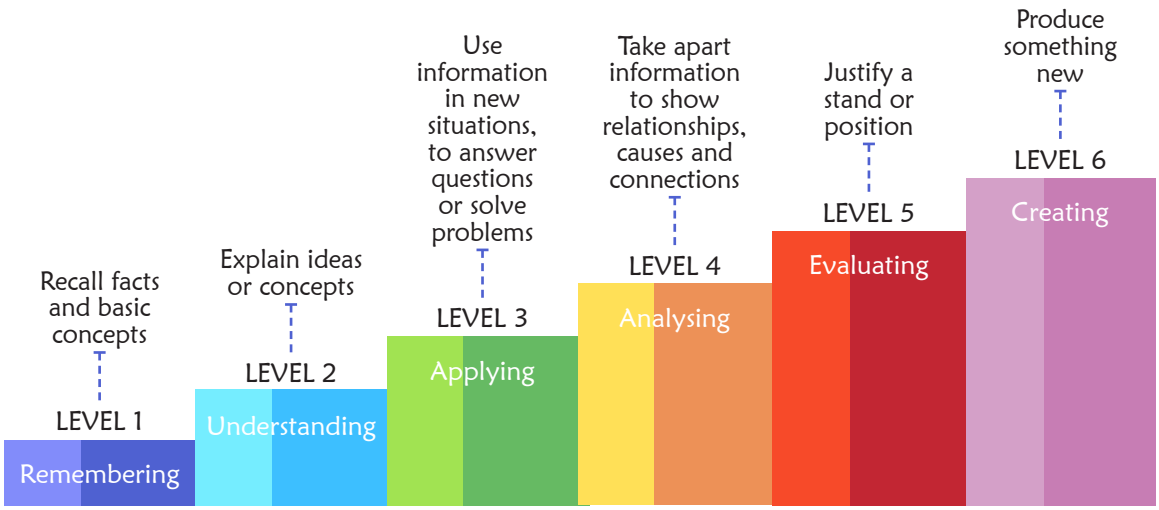
Teaching Strategies

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 6

LESSON PLAN

1 Fundamentals of Computer

Teaching Objectives

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

- Define what a computer is and explain its basic functions.
- Identify hardware and software components.
- Understand and explain the Input-Process-Output cycle.
- Recognise various input and output devices.
- Explain computer memory types and storage devices.
- Demonstrate basic file searching and disk management operations.

Number of Periods	
Theory	Practical
3	2

Teaching Plan

Engagement (Introduction)

1. **Question Prompt:** Ask students:
   - "Where have you seen computers being used today?"
   - "Can a computer think like a human?"
2. **Analogy Activity:** Compare a computer to a school library (Books = Data, Librarian = CPU, Borrowing = Input/Output).
3. **QAXP Activity:** Students form groups and explore the relevance of computers in daily life through structured questions and summarisation.

Lesson Delivery

1. **Introduction to Nested Loops**
   - Define a computer using simple terms.
   - Discuss how computers are used in education, healthcare, communication, etc.
   - Conduct Think-Pair-Share activity: How does a computer help in your daily routine?

2. **Components of a Computer**
   - Distinguish between hardware and software.
   - Display images or actual parts of the CPU, mouse, monitor, etc.
   - Conduct a Round Robin: List as many input/output/storage devices as possible in teams.
3. **IPO Cycle and How a Computer Works**
   - Use real-life scenarios to demonstrate the Input-Process-Output concept.
   - Three-Step Interview: Students explain IPO cycle to a partner, switch roles, and present their partner's explanation to the class.
4. **Memory and Storage**
   - Differentiate between RAM and ROM.
   - Use a table to compare primary and secondary memory with examples.
   - Conduct Think-Pair-Share to discuss advantages of Cloud storage.
5. **File and Disk Management**
   - Demonstrate searching files using a computer/laptop.
   - Show Disk Cleanup and Defragmentation through a screen recording.

Practical Activities

- Explore file searching using wildcards (* and ?).
- Practice Disk Cleanup and identifying Recycle Bin usage.
- Create a presentation or poster on hardware and software components.

Extension

- **Application Cards:** Students write a real-world use of application/system software.
- **Creative Task:** Design a comic strip showing a computer solving daily life tasks.
- **Discussion Prompt:** What will happen if the CPU is removed from a computer?
- **Oral Questions:**
  - What is the main function of RAM?
  - Can we use a computer without software?
  - What device would you use to input your voice?
  - What are two examples of output devices?

Assessment and Evaluation

- **Quiz:** Objective type based on textbook questions (MCQs, True/False).
- **Oral Review:** Quick oral recall of input, process, output devices.
- **Worksheet:** Fill in the blanks, matching exercises.

- **Practical Test:** Search files using wildcards, run Disk Cleanup.
- **Exit Ticket:** One-sentence summary (What did I learn today?)

Suggested Activity

- **Group Activity:** Each group prepares a short role-play about how computers are used in different sectors (school, hospital, shop, etc.).
- **Poster Creation:** Design a poster highlighting the IPO cycle and types of computer memory.
- **Digital Drill:** Visit the computer lab and list hardware and software found on the computer.

2 Algorithm and Flowchar

Teaching Objectives

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

- Define algorithm and flowchart.
- Understand control structures in an algorithm: sequential, selection, and repetition.
- Write simple algorithms using real-life and computational examples.
- Draw flowcharts using standard symbols and rules.
- Solve problems using algorithmic thinking and visual flowchart design.

Number of Periods	
Theory	Practical
3	2

Teaching Plan

Engagement (Introduction)

1. **Ask:** "Have you ever followed a recipe or built something using steps? That's an algorithm!"
2. **Warm-up Activity:** Write steps for brushing teeth – discuss as an algorithm.
3. **QAXP Strategy:** Importance of structured problem solving before writing computer programs.

Lesson Delivery

1. **What is an Algorithm?**
   - Define and explain through examples like area of rectangle, temperature conversion.
   - Discuss rules for writing a good algorithm.
   - Application Cards: Students write an algorithm for their morning routine.
2. **Control Structures in Algorithm**
   - Explain sequential, selection (IF-ELSE), and repetition (loops).
   - Show examples like deciding meals, giving water to plants, and checking voting eligibility.
   - Conduct Think-Pair-Share on which structures are used and why.

3. **What is a Flowchart?**
    - Introduce flowchart symbols: Start/Stop, Process, Input/Output, Decision.
    - Explain rules for drawing flowcharts.
    - Use Graphic Organiser to display flowchart structure.
4. **Algorithm to Flowchart Conversion**
    - Demonstrate conversion through solved examples (even/odd, sum of first 100 numbers).
    - Peer Teaching: Students explain a given algorithm/flowchart to classmates.

Practical Activities

- Write an algorithm for a real-life problem (e.g., preparing for school).
- Draw a flowchart for deciding what to do on a rainy day.
- Digital Drill: Create an algorithm and flowchart to accept marks of 5 friends and calculate average.

Extension

- **Application Cards:** Create pseudocode and compare it with written algorithm.
- **Creative Task:** Design a flowchart for their favourite game logic.
- **Discussion Prompt:** Why are algorithms and flowcharts necessary in programming?
- **Oral Questions:**
    - What are the three control structures?
    - What symbol is used for decision in a flowchart?
    - Give one example of selection structure in daily life.
    - What's the difference between algorithm and flowchart?

Assessment and Evaluation

- **Quiz:** Objective questions on algorithm structure, flowchart rules.
- **Worksheet:** Fill in the blanks, matching symbols, write steps.
- **Oral Review:** Flowchart symbol identification and description.
- **Practical Test:** Write and draw flowchart for a given real-life problem.
- **Exit Ticket:** "Today I learned that..."

Suggested Activity

- **Group Role Play:** Each student performs a step in an algorithm to mimic a sequential task (e.g., making a sandwich).
- **Poster Making:** Display control structures with examples.
- **Guessing Game:** Use clues to guess algorithm or symbol (Guess Who style).

3 Learning Scratch

Teaching Objectives

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

- Understand what Scratch is and how it helps in learning programming.
- Navigate the Scratch interface and identify key elements.
- Add, modify, and animate sprites and backdrops.
- Use coding blocks from categories like Motion, Looks, Control, and Events.
- Create interactive Scratch projects using simple scripts and broadcasting.

Number of Periods	
Theory	Practical
3	3

Teaching Plan

Engagement (Introduction)

1. **Question Prompt:** "If you could make a cartoon or a game, what would it look like?"
2. **Demo Activity:** Play a sample Scratch project – ask students what they think made it work.
3. **Think-Pair-Share:** Explore what block-based coding is and how Scratch simplifies programming.

Lesson Delivery

1. **Introduction to Scratch**
   - Explain what Scratch is and why it is useful.
   - Discuss how it enables coding with drag-and-drop blocks.
2. **Scratch Interface Overview**
   - Identify Menu Bar, Tabs (Code, Costumes, Sounds), Blocks Palette, Script Area, Stage, and Sprites Pane.
   - Demonstrate Go (green flag) and Stop buttons.
3. **Working with Sprites and Backdrops**
   - Add, paint, delete, resize sprites.
   - Change and edit costumes.
   - Add backdrops and discuss backdrop options.
4. **Coding with Scratch Blocks**
   - Introduce basic blocks: Motion, Looks, Control, Events.
   - Demonstrate simple examples: move 20 steps, say "Hello", change costume.
   - Build a small project: e.g., make sprite walk and speak when spacebar is pressed.

5. Extensions: Variables, Operators, Pen and Broadcast

- Use variables to store data like scores.
- Use event blocks for interaction.
- Use broadcast to switch scenes.

Practical Activities

- Create a project where a sprite tells a joke.
- Build a sprite that changes costumes every second.
- Make a sprite bounce on edge and draw a pattern using Pen extension.
- Mini project: Create a short interactive animation or game.

Extension

- **Creative Task:** Create a scene with two sprites talking using speech and broadcast blocks.
- **Debug Challenge:** Find and fix an error in a shared Scratch project.
- **Discussion Prompt:** "Why is it important to give clear steps to sprites?"
- **Oral Questions:**
  - What is a sprite?
  - What block starts a Scratch program?
  - What tab allows you to change a sprite's look?
  - Which block moves a sprite to (x, y) position?

Assessment and Evaluation

- **Quiz:** Objective questions on interface, block types, and usage.
- **Worksheet:** Fill-in-the-blanks and match Scratch components.
- **Practical Test:** Create a scene with a sprite movement and dialogue.
- **Peer Assessment:** Rate each other's Scratch projects.
- **Exit Ticket:** "The most fun thing I did in Scratch today was..."

Suggested Activity

- **Poster Creation:** Visual map of Scratch interface components.
- **Project Showcase:** Display and explain one Scratch project created by each student.
- **Block Hunt:** Match blocks to functions in a treasure-hunt-style worksheet.

4 Cyber Security

Teaching Objectives

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

- Understand what networks and the Internet are.
- Identify types of networks (LAN, WAN, MAN, PAN, VPN).
- Explain cyber threats like malware, spam, phishing, and cyberbullying.
- Recognise the importance of antivirus software, firewalls, and password safety.
- Understand netiquette and basics of cyber law (including the IT Act 2000).

Number of Periods	
Theory	Practical
3	3

Teaching Plan

Engagement (Introduction)

1. **Question Prompt:** "Have you or someone you know ever seen a spam email or pop-up?"
2. **Mini Activity:** Identify suspicious links or messages from samples.
3. **QAXP:** Importance of cyber security in a digital world.

Lesson Delivery

1. **Introduction to Scratch**
   - Discuss types: LAN, WAN, PAN, MAN, VPN.
   - Explain how the Internet connects devices worldwide.

2 **Introduction to Cyber Threats**
   - Define malware, virus, trojan, and worm.
   - Explain phishing and cyber stalking with examples.
   - Discuss spam and its risks.

3. **Cyber Safety Measures**
   - Use of antivirus, firewalls, and password protection.
   - Best practices for protecting data online.

4. **Cyber Laws and Netiquette**
   - Importance of Indian IT Act 2000.
   - Explain terms: cybercrime, trolling, bullying.
   - Discuss online behaviour and community guidelines.

Practical Activities

- Visit the lab and identify whether antivirus is installed.
- Simulate checking links for safety using hover method.
- Poster on do's and don'ts of digital behaviour.

Extension

- **Creative Task:** Write and act out a scenario on phishing scam.
- **Discussion Prompt:** "Why is it important to be kind online?"
- **Oral Questions:**
  - What is spam?
  - What is a firewall used for?
  - What should a strong password include?
  - Name one rule of netiquette.

Assessment and Evaluation

- **Quiz:** Identify types of threats, true/false.
- **Oral Review:** Cybercrime definitions and examples.
- **Worksheet:** Match types of malwares to their effects.
- **Digital Drill:** Malware detection using sample screenshots.
- **Exit Ticket:** "One way I will stay safe online is..."

Suggested Activity

- **Poster Making:** Tips for safe browsing.
- **Role Play:** Good vs. bad netiquette scenario.
- **Class Discussion:** What happens if we ignore cyber laws?