

Lesson Plan

NEUROHEADWAY

Neuroscience Into Education

Computer Science

Objective(s)	Introduction	Main Activity	Reflection	Success Criteria
Understand what computers are in general	Present Slides 3 to 7. Explain the fundamentals and history of computers. Emphasise digital computers and their applications. Illustrate the diversity of computers.	CLASS ACTIVITY: Try to spot all of the computers in the classroom.	CLASS DISCUSSION: How would life have been different without computers? What things can we do today that wasn't possible without computers?	I know that computers are machines that follow instructions. I understand that modern computers are electronic and digital, using binary data and binary logic. I know that computers are not limited to personal computers. extend beyond PCs.
Understand the basic hardware architecture of a computer	Present Slides XX to XX. Explain the basic building blocks of a computer system.	BUILD A COMPUTER: Select one of the activities in Appendix 1. DIFFERENTIATED	PRESENTATION: Show / demonstrate your computer to the rest of the class.	I know that the basic building blocks of a modern computer are: - Input devices

		ACTIVITY: Recommendations also appear in Appendix 1		- Output devices - Central Processing Unit - Memory
Understand the principles of computer software	Present Slides XX to XX XXXXX	PROGRAMME A COMPUTER: Select one of the activities in Appendix 2. DIFFERENTIATED ACTIVITY: Recommendations also appear in Appendix 1	CLASS DISCUSSION: You have now written a computer programme; what kind of real-world problems can we solve with computer programmes?	I understand XXXX NOTHING XXXXXX
Know what computer science is				

Power point presentation

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What are computers?

- A machine
- Accepts inputs
- Processes inputs
 - Calculations
 - Logical decisions
 - Save / recall data
- Produces an output
- Pre-defined instructions



A brief history of computers

- Abacus (2400 BCE)
 - Mechanical calculation aids
- Mechanical Computers
 - Babbage (1833)
 - Calculations and instructions
- Electromechanical Computers
 - Electrical control of mechanical switches (1930's)
 - Digital computing
- All-electrical computers
 - Vacuum tube switches (1944)
 - Transistors (1955)

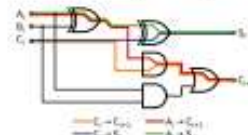


Digital, electronic computers

- Binary data: 1 or 0
 - Represent larger numbers with 1's and 0's
 - $6_{10} \Rightarrow 110_2$
 - Digital: can only be one or the other.
- Digital logic: AND, OR, etc.
 - Binary output for binary inputs
 - Represent ALL decisions and calculations
 - Electronic switches
 - ON and OFF = 1 and 0.



A	B	A AND B	A OR B	NOT A
False	False	False	False	True
False	True	False	True	True
True	False	False	True	False
True	True	True	True	False



All shapes and sizes

- Personal Computer (PC)
 - Screen, box, keyboard, etc.
 - Works for people
 - Laptops? Mobile phones?
- Mainframe Computers
 - Large rooms
 - Large calculations for organizations
- Embedded Computers
 - Home Appliances
 - Cars
 - Factories
 - A single microchip
 - Everywhere!



Hardware, software, science

- Computer hardware
 - Physical circuits
- Computer software
 - Programmes / "apps" that run on the hardware
- Science
 - The methods behind computers

