LESSON 81

Automation

40 minutes | Ethics, Society, and Emerging Technologies | Outcome 1.8 | Outcome 1.11 | Outcome 1.12 | Outcome 1.13 | Outcome 1.14 | Outcome 1.2 | Outcome 1.6

WHAT THIS LESSON DOES

In this lesson, you'll explore how automation uses computing technologies to perform tasks efficiently. Learn its history, analyse benefits like increased efficiency, and consider costs such as job displacement. Evaluate real-world scenarios to understand societal and ethical impacts.

CURRICULUM OUTCOMES

Outcome	What the specification asks for
1.8	evaluate the costs and benefits of the use of computing technology in automating processes
1.11	discuss the complex relationship between computing technologies and society including issues of ethics
1.12	compare the positive and negative impacts of computing on culture and society
1.13	identify important computing developments that have taken place in the last 100 years and consider emerging trends that could shape future computing technologies
1.14	explain when and what machine learning and AI algorithms might be used in certain contexts
1.2	explain how the power of computing enables different solutions to difficult problems
1.6	explain the operation of a variety of algorithms

WHAT STUDENTS SHOULD BE ABLE TO DO

- Understand the fundamental concepts and historical evolution of automation in computing.
- Identify the key benefits of automation and their positive impact on society.
- Recognise the potential costs and ethical challenges associated with automation.
- Evaluate real-world scenarios to balance the trade-offs between benefits and drawbacks.
- Develop critical thinking skills to assess the societal and ethical implications of automated technologies.

BEFORE THE LESSON

- This is a discussion and theory lesson, so no environment or code setup is needed. Read the two scenarios in the Applying to Scenarios step ahead of time so you can steer the debate.
- Have a couple of local or current automation examples in mind to make the trade-offs feel real, for example self-checkouts and warehouse robots.

Automation

HOW THE LESSON RUNS

- Introduction
- Understanding Automation
- Benefits of Automation
- Costs of Automation
- Applying to Scenarios
- Wrap Up

TEACHING MOVES

- 2. Understanding Automation. Anchor automation in algorithmic thinking they already know: a machine follows a sequence of logical steps. Use the historical thread from assembly lines to machine learning to show it is not new, just faster and smarter now.
- 3. Benefits of Automation. Push past the obvious efficiency point. Ask who benefits from cost savings and where freed-up resources actually go, so benefits are seen as choices, not automatic goods.
- 4. Costs of Automation. Keep job displacement from becoming the only topic. Name the ethical, dependency and environmental costs too, and ask whether a cost to one group can be a benefit to another.
- 5. Applying to Scenarios. Split the class across the two scenarios and have each group argue both sides before deciding. Insist they name who wins and who loses, not just whether it is efficient.
- 6. Wrap Up. Draw out that a balanced evaluation is the skill, not a verdict for or against automation. Ask each student for one cost and one benefit they had not considered before.

WHAT TO WATCH FOR

- Students treat automation as new, tied only to AI and robots, and miss that it stretches back to mechanised production. Use the assembly line example to show automation predates computers. Ask them to name an everyday automated thing that is not AI, such as a washing machine cycle.
- Students frame the benefits-versus-costs question as one with a correct answer they should reach. Reward well-argued positions on both sides. Make clear the specification skill is evaluating trade-offs, so a strong answer names impacts on different groups rather than declaring a winner.

DIFFERENTIATION

- Emerging: Give a single scenario and a simple two-column frame: one benefit, one cost. Ask them to say who each affects before generalising.
- Developing: Have them argue the opposite side of the scenario they instinctively picked, so they reason rather than restate a preference.
- Proficient: Ask them to bring in an ethical dimension the lesson only touches, such as privacy or environmental impact, and structure it as evidence they could cite in a written answer on the societal impact of computing.