

LESSON 16

Future Trends in Computing

40 minutes

Foundations of Computer Science

Outcome 1.11

Outcome 1.12

Outcome 1.13

Outcome 1.14

Outcome 1.18

WHAT THIS LESSON DOES

In this lesson, you'll explore the exciting world of upcoming advancements in technology. You'll learn about cutting-edge developments like quantum computing, edge computing, IoT, and AI, and reflect on their potential impact on society and your future.

CURRICULUM OUTCOMES

Outcome	What the specification asks for
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
1.18	recognise the diverse roles and careers that use computing technologies

WHAT STUDENTS SHOULD BE ABLE TO DO

- Understand key emerging trends in computing, including quantum computing, edge computing, IoT, and AI.
- Analyse the potential societal impacts of advanced computing technologies.
- Evaluate the ethical and privacy challenges associated with future computing innovations.
- Recognise the role of AI and its applications in transforming everyday life and industries.
- Reflect on how computing trends could influence personal and professional futures.

BEFORE THE LESSON

- This is a reading and writing lesson, so no editor or environment setup is needed. Confirm students have a text document or notebook ready for the written reflection in the Activity step.
- Have one or two current Irish examples ready to anchor the abstract terms, for example smart meters or wearable fitness devices for IoT.

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HOW THE LESSON RUNS

Introduction

Overview of Future Computing Trends

Quantum Computing

Edge Computing

Internet of Things (IoT)

Artificial Intelligence (AI)

Activity

Wrap Up

TEACHING MOVES

- 2. Overview of Future Computing Trends. Frame the four trends as a set before detail arrives, so students hold the map. Flag up front that every trend carries both a promise and a cost, since the Activity asks for both.
- 3. Quantum Computing. Anchor the qubit and superposition idea with the plain claim that it lets many possibilities be examined at once. Do not attempt the physics. Stress this is still emerging, not a machine on any desk today.
- 4. Edge Computing. Use the self-driving car to make latency concrete: the round trip to a distant server is too slow for split-second decisions. Contrast processing at the device with processing in the cloud.
- 5. Internet of Things (IoT). Ask for everyday objects in students' own homes that connect to the internet. This surfaces the privacy question naturally: each smart device is also collecting data about someone.
- 6. Artificial Intelligence (AI). Draw the line between traditional programming, where every step is coded, and machine learning, where a model learns patterns from data. This distinction is the one worth them being able to state.
- 7. Activity. Hold students to all three parts: describe in their own words, one benefit, one challenge. The description in their own words is the check that they understood rather than copied.
- 8. Wrap Up. Pull the ethics thread across all four trends: privacy, security, and effects on employment recur. Ask which trend students think will affect their own working life most.

WHAT TO WATCH FOR

- Students treat quantum computing as a faster ordinary computer that will soon replace laptops. Clarify it is suited to specific problems, is still largely experimental, and will not replace everyday machines. It complements classical computing rather than superseding it.
- Students see edge computing and cloud computing as opposites where one is always better. Frame them as a trade-off. Edge cuts latency for time-critical tasks, the cloud offers scale and storage. Most systems use both depending on what the task needs.
- AI is imagined as a machine that thinks like a person, rather than a system finding patterns in data. Return to the machine learning description: it recognises patterns and makes predictions from training data. It has no understanding of what the data means.

DIFFERENTIATION

- Emerging: Let them choose the trend they already have a personal example of, for example a fitness tracker or a smart speaker, so the reflection starts from something familiar. Offer a sentence stem for each part of the written task to get them past the blank page.
- Developing: Ask them to explain their chosen trend aloud to a partner before writing, so the description in their own words is rehearsed first.
- Proficient: Push toward Higher Level treatment: ask them to name a specific ethical framework or law, such as GDPR, that would govern the data their chosen trend collects. Have them argue whether the benefit outweighs the challenge for their trend, with a reasoned position rather than listing both.