

# Computational Thinking

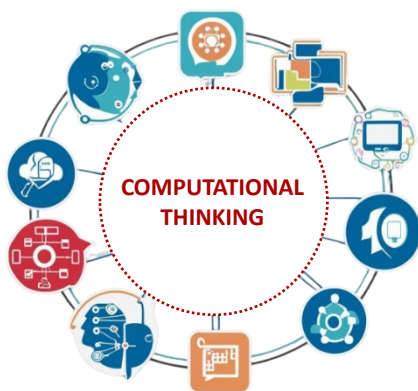
**Computational thinking is a fundamental skill for everyone and a key competence for digital transformation.** Computational thinking is about understanding how computers process data and how they can be used to solve problems and produce information.

As modern society relies on digital technologies, computational thinking is needed to understand, for example, automated decision-making processes and customised content in online services, and to tackle disinformation on social media. Understanding the logic behind algorithms, reasoning, and decision-making mechanisms is also essential for the responsible and ethical use of artificial intelligence.

**Computational thinking refers to a set of cognitive skills needed to understand the digital world.** It focuses on analytical problem solving and creating solutions that can be carried out by a combination of humans and machines.

Computational thinking skills can include:

- Logical reasoning
- The ability to think algorithmically
- The use of various problem-solving strategies
- Creating abstractions
- Analysing, decomposing and creating classifications
- Identifying patterns
- Using formal (programming) language



Computational thinking skills can also be applied in individual and collaborative thinking, problem-solving, and creative pursuits. Supporting the development of the computational thinking skills ensures that digital citizens are not just consumers but active contributors in the digital era.

## Questions to ponder:

1. Why are computational thinking skills important?
2. How can we provide learning opportunities on computational thinking skills across disciplines and contexts?
3. How can strengthening computational thinking skills support the development of basic and advanced digital skills?
4. What computational thinking skills are needed when using generative AI with prompts?

## For references and more information:

1. Reviewing Computational Thinking in Compulsory Education State of play and practices from computing education, European Commission: Joint Research Centre, 2022, <https://data.europa.eu/doi/10.2760/126955>
2. Computational Thinking Education in K–12: Artificial Intelligence Literacy and Physical Computing, MIT Press 2022, <https://doi.org/10.7551/mitpress/13375.001.0001>
3. Computational Thinking for All, ISTE, 2025, <https://iste.org/blog/computational-thinking-for-all>
4. Computational Thinking, Jeannette M. Wing, 2006, Communications of the ACM 49(3), [https://www.researchgate.net/publication/274309848 Computational Thinking](https://www.researchgate.net/publication/274309848_Computational_Thinking)