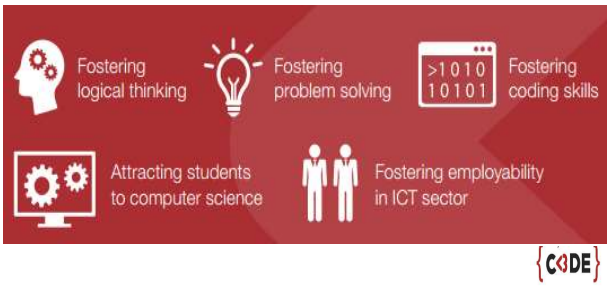
What is Computational Thinking?

"Computational thinking will be a fundamental skill used by everyone by the middle of the 21st Century. Just like reading, writing and arithmetic."

Wing (2011) Computational Thinking

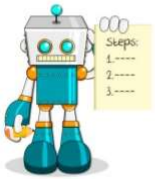
What is Computational Thinking?



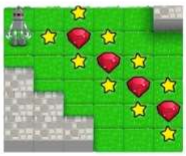
What is Computational Thinking?

ABSTACTION

ALGORITHMIC THINKING

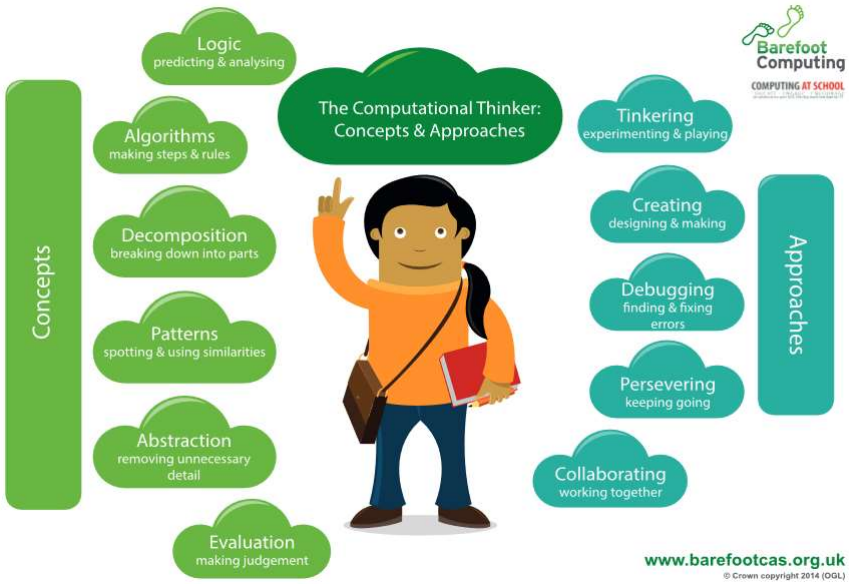


DECOMPOSITION



PATTERN RECOGNITION

BOMBERBOT



Learning to Code

CODE

HOUR OF CODE

CODEMONKEY

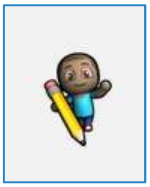
TYNKER™
CODING FOR KIDS

CODE COMBAT

Time to Code

Task 1: Explore *Code.org*

https://studio.code.org/flappy/1



https://studio.code.org/s/artist/stage/1/puzzle/1

https://studio.code.org/s/20-hour/stage/2/puzzle/1

Reflect

In which subjects / topics would you integrate them?

How would you adopt them?

Professional Learning Community
forum.code.org

Task 2: Code Combat

www.codecombat.com

Coding Through Games

Learning through games without the need to have any previous experience,

Learning is fun and motivational,

Learning which is student centred, graded by difficulty,

Learning a language, more importantly at this level, students will learn the concepts.

Task 3: Online Doc

Name of the Game	Link to find more information about the game	How can you use it in the classroom?

http://tinyurl.com/codegames2016

Coding

Why Learn to Code?

In a world where we're surrounded by technology, and where so many of our interactions we have are with computers, learning to code helps us understand how these services work.

What's more, learning to code gives us a powerful way to explore our ideas and make things, both for work and play.

Playing around with Code

A range of activities can be used that allow students to collaborate and construct problem solutions, for example;

1. Code walkthroughs,
2. Writing algorithms in groups,
3. Insert comments in pairs into existing code,
4. Develop code from algorithm in pairs,
5. Find the bugs in code.

(Van Gorp & Grissom, 2001)

What is Coding?

Coding is becoming increasingly a key competence which will have to be acquired by all young students and increasingly by workers in a wide range of industries and professions. Coding is part of logical reasoning and represents one of the key skills which are part of what is now called “21st century skills”.

European Schoolnet (2014)

What is Coding?

Code: each and every interaction between humans and computers is governed by it. Whether you create a web app, simulate the formation of stars or the neuronal pathways in the brain. Coding is everywhere.

is a way of looking at the world: a way to break tasks into ever smaller subsets. It is a fun and creative field full of great people and passionate communities.

…and yet there is a projected shortfall of up to 900,000 ICT professionals in Europe by 2020.

Coding or Computational Thinking?

Programming/ computational thinking: "to be able to define a set of instructions to reach a given goal from a given starting point; to be able to write a concrete set of instructions for a computer to let the computer run a certain task." (Belgium Flanders).

or

Algorithmic thinking: "The ability to propose a step by step solution to a problem (an algorithm), consisting of a finite, clearly defined set of simple (definite, unambiguous) steps. **Programming:** "The ability to realise an algorithm in a computer programming language, that is to interpret the steps of the algorithm as instructions in a programming language, as a computer programme, to compile, run and debug the programme, as well as to identify and reuse common design patterns." (CY). (see Annex for country details)

European Schoolnet, 2014