COMPUTATIONAL THINKING (CT)

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Examples

- Cooking
- Driving
- Painting
- Jigsaw
- Math
- Learning a language
- (essentially anything you do)

Source: https://pixabay.com/
Why talk about CT?

- Way of thinking
- Logical approach
- Deterministic (as opposed to ad-hoc approach)
Target audience

- Ages 0 and above
Stages

- Decomposition
- Pattern recognition
- Pattern generalisation (abstraction)
- Algorithm development
- Testing

Source: https://www.flickr.com/
Decomposition

- Breaking a problem down into sub-components.
- Identifying aspects, participants, processes.
- For example, decomposing the process of making tea leads us to identifying the ingredients - water, tea, sugar, milk, etc and also other entities required like kettle, stove, strainer, pot/cups.
Pattern recognition

- Identifying patterns that appear in the domain. For example, a pattern in the process of tea is that the best flavours are released when
  - the water is in a specific temperature range (when tea bags are dunked)
  - the duration of steeping is within a specific time range.
Pattern abstraction

- Applying identified patterns to a more wider variety of situations.

- For example, you can extend the following parameters that are there for making one cup of tea for making a larger quantity:
  - one tablespoon of tea leaves
  - water at 95 degrees celsius
  - steeping time of 3 minutes
Algorithm

- Given a set of inputs, a well-defined (step-by-step) process to achieve a result.
- An algorithm can be more abstract/generic or more specific/detailed
Tea algorithm
Version 1

1. Boil water
2. Steep tea
3. Strain
4. Serve
Tea algorithm
Version 2
Testing

- Critical, yet often overlooked step, of learning from the outcome to modify the process or even the understanding of the process.