Computer Science Principles

Abstraction

Computer Science Principles

1. Creativity
2. Abstraction
3. Data and Information
4. Algorithms
5. Programming
6. The Internet
7. Global Impact

Computational Thinking Practices

1. Connecting computing
2. Connecting computing artifacts
3. Abstracting
4. Analyzing problems and artifacts
5. Communicating
6. Collaborating

Computer Science Principles -Abstraction

There are two definitions of abstraction:

1) **Detail removal:** “The act or process of leaving out of consideration one or more properties of a complex object so as to attend to others.” It tells you to remove the parts that are not important about an entity.
2) **Generalization:** “The process of formulating general concepts by abstracting common properties of instances.”

Computer Science Principles -Detail Removal

Abstraction is the idea that you focus on the essence, the cleanest way to map the messy real world to one you can build.

A challenge in abstraction is to know what to remove and what to keep. For that it is important to understand the problem that wants to be solved. It is important to listen to experts in the area to determine objectives and the most relevant details in the problem that needs to be solved.

Computer Science Principles -Generalization

You identify multiple copies of an entity and you design a general solution.

You think about what is the input that makes sense for the general problem and eliminate redundancy in steps. That way you eliminate duplication of code.

It’s about exploring all the instances of the problem and coming with a general solution that applies to all.