Computer Science Principles: Learning Objectives

Big Idea I: Creativity. The student can …
LO 1.1.1: ... use computing tools and techniques to create artifacts.
LO 1.1.2: ... collaborate in the creation of computational artifacts.
LO 1.1.3: ... analyze computational artifacts.
LO 1.2.1: ... use computing tools and techniques for creative expression.
LO 1.3.1: ... use programming as a creative tool.

Big Idea II: Abstraction. The student can …
LO 2.1.1: ... describe the combination of abstractions used to represent data.
LO 2.1.2: ... explain how binary sequences are used to represent digital data.
LO 2.2.1: ... develop an abstraction.
LO 2.2.2: ... use multiple levels of abstraction in computation.
LO 2.3.1: ... use models and simulations to raise and answer questions.

Big Idea III: Data. The student can …
LO 3.1.1: ... use computers to process information to gain insight and knowledge.
LO 3.1.2: ... collaborate when processing information to gain insight and knowledge.
LO 3.1.3: ... communicate insight and knowledge gained from using computer programs to process information.
LO 3.2.1: ... use computing to facilitate exploration and the discovery of connections in information.
LO 3.2.2: ... use large data sets to explore and discover information and knowledge.
LO 3.3.1: ... analyze the considerations involved in the computational manipulation of information.

Big Idea IV: Algorithms. The student can …
LO 4.1.1: ... develop an algorithm designed to be implemented to run on a computer.
LO 4.2.1: ... express an algorithm in a language.
LO 4.3.1: ... appropriately connect problems and potential algorithmic solutions.
LO 4.4.1: ... evaluate algorithms analytically and empirically.

Big Idea V: Programming. The student can …
LO 5.1.1: ... explain how programs implement algorithms.
LO 5.2.1: ... use abstraction to manage complexity in programs.
LO 5.3.1: ... evaluate a program for correctness.
LO 5.3.2: ... develop a correct program.
LO 5.3.3: ... collaborate to solve a problem using programming.
LO 5.4.1: ... employ appropriate mathematical and logical concepts in programming.

Big Idea VI: Internet. The student can …
LO 6.1.1: ... explain the abstractions in the Internet and how the Internet functions.
LO 6.2.1: ... explain characteristics of the Internet and the systems built on it.
LO 6.2.2: ... analyze how characteristics of the Internet and systems built on it influence their use.
LO 6.3.1: ... connect the concern of cybersecurity with the Internet and the systems built on it.

Big Idea VII: Impact. The student can …
LO 7.1.1: ... analyze how computing affects communication, interaction, and cognition.
LO 7.1.2: ... collaborate as part of a process that scales.
LO 7.2.1: ... connect computing with innovations in other fields.
LO 7.3.1: ... analyze the beneficial and harmful effects of computing.
LO 7.4.1: ... connect computing within economic, social, and cultural contexts.

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