



## SOUTHERN LEHIGH SCHOOL DISTRICT

5775 Main Street  
Center Valley, PA 18034

### Scope and Sequence for **Introduction to Computer Science I**

#### K-12 Computer Science Core Practices:

- |   |  |
|---|--|
| <ol style="list-style-type: none"><li>1. Fostering an Inclusive Computing Culture</li><li>2. Collaborating Around Computing</li><li>3. Recognizing and Defining Computational Problems</li><li>4. Developing and Using Abstractions</li></ol> | <ol style="list-style-type: none"><li>5. Creating Computational Artifacts</li><li>6. Testing and Refining Computational Artifacts</li><li>7. Communicating About Computing</li></ol> |
|---|--|

#### CS Computing Systems

##### CCSSM

##### PA Core Standards for Mathematics

###### Devices

**3A-CS-01** Explain how abstractions hide the underlying implementation details of computing systems embedded in everyday objects.

###### Hardware & Software

**3A-CS-02** Compare levels of abstraction and interactions between application software, system software, and hardware layers.

###### Troubleshooting

**3A-CS-03** Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

#### DA Data and Analysis

##### CCSSM

##### PA Core Standards for Mathematics

###### Storage

**3A-DA-09** Translate between different bit representations of real-world phenomena, such as characters, numbers, and images.

**3A-DA-10** Evaluate the tradeoffs in how data elements are organized and where data is stored.

###### Collection Visualization and Transformation

**3A-DA-11** Create interactive data visualizations using software tools to help others better understand real-world phenomena.

###### Inference & Models

**3A-DA-12** Create computational models that represent the relationship among different elements of data collected from a phenomenon or process.

## AP Algorithms and Programming

CCSSM

PA Core Standards for Mathematics

### Algorithms

**3A-AP-13** Translate between different bit representations of real-world phenomena, such as characters, numbers, and images.

### Variables

**3A-AP-14** Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.

### Control

**3A-AP-15** Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.

**3A-AP-16** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.

### Modularity

**3A-AP-17** Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

**3A-AP-18** Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.

**3A-AP-19** Systematically design and develop programs for broad audiences by incorporating feedback from users.

### Program Development

**3A-AP-20** Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.

**3A-AP-21** Evaluate and refine computational artifacts to make them more usable and accessible.

**3A-AP-22** Design and develop computational artifacts working in team roles using collaborative tools.

**3A-AP-23** Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.

## IC Impacts of Computing

CCSSM

PA Core Standards for Mathematics

### Culture

**3A-IC-26** Demonstrate ways a given algorithm applies to problems across disciplines.

### Social Interactions

**3A-IC-27** Demonstrate ways a given algorithm applies to problems across disciplines