3.CSY.1 Computing Systems

> *The student will model how computing devices within a computing system work. (a) Describe the role of a processor in a computing system. (b) Explain the relationship between the inputs, processors, and outputs. (c) Discuss various types of input data a computer can accept and use. (d) Model how a computing system works including input and output, processors, and sensors.*

Understanding the Standard

Computing systems are made up of all the hardware and software components that work together to accomplish a task. Systems communicate through inputs and outputs (I/O). Input is the data taken in by a computer usually through a keyboard, mouse, game controller, or camera. The computer then processes the data by executing an algorithm. Output is the data or action produced by the computer, expressed through parts such as projectors, monitors, printers, or speakers.

Term	Definition
Computing system	Interconnected computer components that work together to accomplish large tasks
Processor	Part of a computer that receives input and determines what to do with it using one or more algorithms.
Input	Data that is taken in by a computer for processing.
Sensor	A device that measures events or changes and sends information into a computer.
Output	Information produced by a computer as a result of a program.

Prerequisite Knowledge

Students should have a foundational knowledge of the basic parts of a computer and their functions.

Integration Opportunities

Math 3.CE.2g Use multiplication and division facts through 10 × 10 to create and solve contextual problems while modeling a computing system by identifying inputs, processors, and outputs.

English 3.C.3a Have students work in pairs or small groups using multimodal tools to create a simple presentation that clearly communicates how computing systems work.

Visual Arts 3.10 When using technology to create art, inputs and outputs are needed. Identify the inputs and outputs used.

Physical Education 3.5a Have students create a model explaining energy balance, including how good nutrition (energy in) affects physical activity (energy out).

Summary of a Lesson

Present a slide to the class with a picture of a desktop computer and direct students to talk to their partners to identify all the parts they can see and their functions. After selecting a few students to share their observations, present a second slide with definitions and examples for the terms computing system, input, processor, and output. Have the class categorize all of the previously-identified parts as input, processors, or outputs. You may want to show some of the internal parts of the computer through photos or by opening up an older, unused computer. Students will again talk to their partners and brainstorm additional kinds of computing systems (e.g. tablets, touchscreens, gaming consoles, etc). Partners will then select one computing system from the list and create a diagram (either hand-drawn or using a computer) that models how the I/O of their selected system works with accurately labeled hardware and software.