

# Unit 1 Hardware vs. Software

Content Area: **Computer Science**  
Course(s):  
Time Period: **Trimester 1**  
Length: **30 Days**  
Status: **Published**

## Brief Summary of Unit

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Through a series of learning activities and a project, students will learn the names and functions of important computer hardware and how these parts interact with computer software.

## Standards

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LA.K-12.NJSLSA.L4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.
LA.K-12.NJSLSA.L5	Demonstrate understanding of word relationships and nuances in word meanings.  Constructing explanations and designing solutions in in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.
SCI.HS.ESS3.C	Human Impacts on Earth Systems  Analyzing data in 9–12 builds on K–8 experiences and progresses to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data.
CS.6-8.8.1.8.CS.2	Design a system that combines hardware and software components to process data.
CS.6-8.8.1.8.DA.2	Explain the difference between how the computer stores data as bits and how the data is displayed.
CS.6-8.8.1.8.DA.3	Identify the appropriate tool to access data based on its file format.
CS.6-8.8.1.8.NI.1	Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination.
CS.6-8.8.1.8.NI.2	Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication.
CS.6-8.8.1.8.NI.3	Explain how network security depends on a combination of hardware, software, and practices that control access to data and systems.
CS.6-8.8.1.8.NI.4	Explain how new security measures have been created in response to key malware events.
CS.6-8.8.2.8.ITH.1	Explain how the development and use of technology influences economic, political, social, and cultural issues.
CS.6-8.8.2.8.ITH.2	Compare how technologies have influenced society over time.
CS.6-8.8.2.8.ITH.3	Evaluate the impact of sustainability on the development of a designed product or system.
CS.6-8.8.2.8.ITH.5	Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another.
CS.6-8.CS	Computing Systems

CS.6-8.NI

Networks and the Internet

WRK.K-12.P.5

Utilize critical thinking to make sense of problems and persevere in solving them.

WRK.K-12.P.8

Use technology to enhance productivity increase collaboration and communicate effectively.

An essential aspect of problem solving is being able to self-reflect on why possible solutions for solving problems were or were not successful.

The information sent and received across networks can be protected from unauthorized access and modification in a variety of ways. The evolution of malware leads to understanding the key security measures and best practices needed to proactively address the threat to digital data.

## **TRANSFER**

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- Decide on necessary amounts of computer memory and CPU speed when making computer purchases.
- Navigate new operating systems.
- Troubleshoot computer functioning issues.

## **Essential Questions**

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- How do the different parts of the computer work together?
- What is the difference between Hardware and Software?

## **Essential Understandings**

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- Input devices can be used to type in programs, or change what a program does.
- Programs (software) are read from the memory of the computer and turned into simple coded instructions (binary code).
- Since computers play such an important role in our everyday lives and careers, we should understand their basic operations.

## **Students Will Know**

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- Computer hardware represents the physical parts of the computer that can be seen and touched, e.g., the monitor.
- Output devices display, print, or play processed data from the computer, e.g., monitors, printers, speakers.
- RAM stands for Random Access Memory and is temporary memory that the computer uses to store programs and files.
- Software is a general term for the various kinds of programs used to operate computers and related devices, e.g., operating systems (Windows), applications like Google Docs.
- The computer uses input devices to enter data into the computer, e.g., the mouse, keyboard, webcam, microphone.

- The computer's hard drive is storage memory where files and programs can be saved.
- The CPU stands for the Central Processing Unit – it processes the information input into the computer and is known as the microprocessor or “the brain” of the computer.
- There are various data storage options.

## **Students Will Be Skilled At**

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- Understanding how computer hardware and software work together.
- Identifying the main parts of a computer, input & output devices, storage devices and understanding their functions and how to use them.
- Save and manage files.

## **Evidence/Performance Tasks**

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### Assessments

- Formative: Daily assessments using examples from class notes and CodeHS.com
- Summative: Teacher-created assessments/projects and CodeHS Computer Science Projects
- Benchmark: Check for understanding benchmark assessments on CodeHS
- Alternative Assessments: Student-centered activities such as a doorbell coding project, game design projects, and other activities involving real world applications
- [Activities/Assessments Folder](#)

Core instructional materials: [Core Book List](#)

Supplemental materials: Khan Academy

- A test/quiz will be given on the important computer terms from the video: CPU, hard drive, RAM, hardware, software, input/output devices, operating system, essential understanding of how the hardware and software work together.
- Students will create a Google Slide about a computer part that explains its function, how it interacts with software, and displays its image. Students will present this slide to the class.

## **Learning Plan**

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- Students will answer questions based on the facts in the video in writing.
- Students will share and discuss their answers with the class.
- Students will watch a video about computer hardware and software and how they work together.

## **Materials**

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Core instructional materials: [Core Book List](#)

Supplemental materials: CodeHS

[CodeHS.com](#)

<https://edu.gcfglobal.org/en/computerbasics/basic-parts-of-a-computer/1/>

<https://www.youtube.com/watch?v=HB4I2CgkcCo>

<https://blog.google/inside-google/infrastructure/how-data-center-security-works/>

<https://www.liveworksheets.com/ne2476400bs>

<https://www.youtube.com/watch?v=mCq8-xTH7jA&list=PLzdnOPI1iJNcsRwJhvksEo1tJqjIqWbN->

<https://www.youtube.com/watch?v=fkGCLIQx1MI>

## **Suggested Strategies for Modifications**

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[Possible accommodations/modification for Computers - Grade 6](#)

