Unit 5 Devices & Networks

Content Area: **Computer Science**
Course(s):
Time Period: **Marking Period 2**
Length: **3-4 Weeks**
Status: **Published**

Brief Summary of Unit

This final unit begins by exploring the components of a computer, and then we examine the concept of a network. Then, we discuss how computers are connected in a network and how they communicate. Students gain an introduction to Wireshark. We conclude by discussing Internet communication protocols and packet delivery.

Revised Date: July 2025

Standards

1	Make sense of problems and persevere in solving them
P.1	Act as a responsible and contributing community members and employee.
8.1.12.CS.1	Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.
8.1.12.CS.2	Model interactions between application software, system software, and hardware.
8.1.12.CS.3	Compare the functions of application software, system software, and hardware.
P.6	Model integrity, ethical leadership and effective management.
P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
8.1.12.NI.1	Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.
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.
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.
8.1.12.NI.4	Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.
8.1.12.IC.1	Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.
8.1.12.IC.3	Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.

Essential Questions

- How are devices on a network identified and what are some ways they can communicate?
- How are packets delivered across networks between devices?
- How can students communicate through devices in the activity?
- How does a computer work?
- What is the difference between a WAN and a LAN and what are some basic network components?

Enduring Understandings

- Different network architectures can be useful in allowing computers to communicate.
- There are established protocols allowing different devices to communicate on a network.
- While electronics have grown increasingly complex, all computers still have components in comment that carry out the basic functions of a computer.

Students Will Know

- How networks can be used to allow devices to communicate.
- Some of the protocols used to share information between devices on a network.
- The anatomy of data packets.
- The basic components of a computer.
- The role of protocols in the transmission of data through the Internet.

Students Will Be Skilled At

- Identifying different network architectures from a diagram.
- Identifying different parts of a computer.
- Using Wireshark to analyze network traffic.

Assessment

Assessments

- Formative: Teacher observations, student-centered discussions, classwork, student-centered labs.
- Summative: Quizzes, tests, projects.
- Alternative: Verbal discussions and debrief.

Learning Plan

This curriculum follows cyber.org's "Cybersecurity 1" course as listed in the "One Semester Plan." Go to https://cyber.instructure.com/login/canvas and apply for a teacher account. Under "High School 9-12," you will find the Cybersecurity 1 course with detailed lesson plans and pacing. They assume roughly 45 minute classes. Below is a modified pacing guide to align more smoothly with our rotating drop schedule.

There are 5 assessment days that can be used throughout the course with the timing below if none of the "if time allows" lessons are taught. These days can be used for quizzes/tests as the teacher sees fit.

- Section 5.1 - Computer Components
  - 5.1.1 - Computer Components **(2 Classes)**
- Section 5.2 - Networking Fundamentals
  - 5.2.1 - Network Connections **(2 Classes)**
  - 5.2.2 - Network Naming **(2 Classes)**
- Section 5.3 - Protocols & Packets
  - 5.3.1 - Communicating in a Network **(2 Classes)**
  - 5.3.2 - Packet Delivery & Protocols **(3 Classes)**

Materials

- Core instructional materials: Core Book List
- Supplemental materials: Resources from the cyber.org curriculum "Cybersecurity 1."

- Computers
- Teacher created activiites
- Teacher created notes
- Websites to research current events

Integrated Accommodation & Modifications

Possible accommodations/modification for Introduction to Cybersecurity