

# Networking: How Data Moves

TOPIC: NETWORKING, HARDWARE & SOFTWARE

GRADES: 3-5

LESSON DURATION: 45 MINUTES

SOFT SKILLS: COMMUNICATION, COLLABORATION, CRITICAL THINKING

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## Learning Outcome:

- Students will discover the history and impact of networking by discussing the evolution of information storage.
- Students will analyze the positive and negative aspects of each type of data storage as well as the benefits and risks of relying on network storage.

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## Materials:

- Physical examples of storage devices (floppy disk, HDD/CD/DVD, USB)

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## Activities:

1. The teacher can begin with a discussion on the history of networking.
2. How did we do certain things before networking? Students will need help with this part as many never experienced life before networking. Additional prompts or guiding questions might be necessary.
  - A. Prior to interconnected computers, how did we send a written message? (mail or courier)
    - I. What impact has the internet had on the US Post Office? On writing letters? What do people do instead? (send email, electronic cards, text, phone call, videos, Facebook posts, snaps, etc). Therefore, post office activity has declined somewhat. A chart of PO activity can be found at <https://about.usps.com/who-we-are/postal-history/pieces-of-mail-since-1789.htm>, (This would be a good activity for math class and the proper way to read data).
    - II. Prior to school or office networks (LANs), how was information shared? (Typed memos; word of mouth; internal mail)
    - III. What impact has the establishment of networks (and technology) had on human communication? (This may be a bit advanced for the age but the teacher can frame and discuss, as needed).
  - B. Prior to the massive existence of networks and WiFi, how did we print documents? (The printer had to be a connected device. The home-printer would be connected to desktop station. If you didn't have a printer, you would save on a disk and take to a location with a printer). Now we have wireless printers and we can print from any device connected through the wireless network.
  - C. How did we get a new driver to install for our computer? How did we install new software (mail or on a floppy disk). How do we does this today? (we can add apps via iTunes or

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- downloads; software can be purchased and downloaded online within seconds; any updates or flaws can be done automatically through “pushed” updates/patches-students with a Smartphone will understand this)
- D. How would we share a file? For instance, Bob and Sue are working on a project together but need to combine information-how was it done? (print it or walk the floppy disk over).
    - I. What ways do you share files when working on a group project in this class? (Google doc, email, USB, etc)
  3. This discussion can also include a discussion on the evolution of storage devices (this is technical but many teachers have used these sorts of storage devices and remember the positives and negatives).
    - A. The general overview of storage evolution is: floppy -->HDD/CD/DVD -->USB to SSD --> cloud storage - i.e. WHERE is my “stuff” (data) when I use networks? This article from recode.com explains the cloud in simple terms. [What is the cloud???](#) The evolution of this process can also include a discussion on the changes in personal information security. What security issues did one have to recognize when using a floppy disk versus storage in the cloud? (Floppy disk=physical storage issues-Don't lose it, don't harm it, label it with contents whereas the cloud-where is my data, who can access it, where is it stored?)
    - B. This part of the discussion can be strengthened with the use of visuals and tangible objects. Therefore students can see the evolution of storage (or in some cases, cannot see- i.e. cloud)
    - C. Is one type of storage (visible versus the cloud) safer than the other?
    - D. Advanced students may be able to have a discussion on the positives and negatives of each type of storage. Students should be asked to verbalize the positive and negative aspects of cloud storage.
  4. This discussion based activity can be followed by one of the hands-on networking activities in which students simulate the movement of information across the network, using strings, yarn, or beanbags.

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### Enrichment/Follow-up:

1. If the teacher is tech savvy and the students are capable, this is a great opportunity to talk basic safety issues with networking. For instance, what are the benefits to “the cloud” and what are the risks? What is an easy rule to remember with USB devices? (if it's not mine, don't touch it-could be carrying malware/viruses). What might the storage of data look like in the future? Is there something better than the cloud?
2. If applicable, students can be asked to identify the types of storage that they use. Do they prefer a USB, a school network storage drive, or the cloud? Why do they prefer the method? What are the positives and negatives of their choice? Have they ever experienced an issue or problems retrieving their stored information? How was it handled? If students do not have experience in data storage yet, this conversation could focus on best practice instead. Students could be taught when a USB might be better than cloud storage; how/when/why to backup data; issues with reliance on network storage (for example-saving on a school network drive but then not having access from the home network); etc.

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