Teacher Syllabus and Notes
Day 3

Encryption and Decryption
Estimated time: 2 hours, 35 minutes

AGENDA

- Reminder of classroom management (5 minutes)
  - Sign in to Gmail, launch syllabus, vocab wall, bonus work
- Watch the video "The Secret Lives of Hackers" (10 minutes).
  - Discussion: What is hacking?
  - Name some examples of hacks outside of computing.
  - What are some reasons that people hack computers?
  - How can hackers protect people from exposing personal information?
- Watch the video "Encryption and Public Keys" (10 minutes).
  - Discussion: How can we tell if a website we are using is secure and safe? (HINT: "S")
- Caesar's Cipher group encryption races (25 minutes)
  - Have groups of 3–4 students write an encrypted message for other groups to decrypt using this online version of the cipher.
  - Remember, the inner circle is the original ABCs; the outer circle is the code. Spin the circle to the left!
- Watch this keylogger video (5 minutes)
  - Discussion: What is a keylogger?
  - A keylogger is a type of surveillance hardware or software (considered to be spyware) that has the capability to record every keystroke you make to a log file, usually encrypted. A keylogger recorder can record instant messages, email, and any information you type at any time using your keyboard, including your passwords.
  - Is it legal? Yes! Can schools or parents use keyloggers? Yes!
- Read "Protecting Your Device from Malware and Hackers" (30 minutes).
  - Divide the reading up into 4–5 groups. Have groups do informal mini presentations about key points and what they learned. Each group gets 1 minute to tell about their section of the reading.
- Watch the video "Cyber Security and Crime" (10 minutes).
  - Discussion: Make sure they understand viruses, malware, DoS attacks, and phishing scams.
  - Break (5 minutes)
  - Discovering cryptanalysis
  - What is a crypanalyst or cryptographer?
  - A person who creates algorithms for transforming plain text into unreadable information (cipher text) or for decoding encrypted information.
- Research: cyber degrees: education and salary (20 minutes). Have students research and answer the following questions and share with the class.
  - What does a cryptographer/cryptanalyst do?
  - What is the average salary for those jobs?
  - What are the job requirements?
- Watch the video "Bitcoin: How Cryptocurrencies Work" (10 minutes).
  - You may want to show just a short portion if you're low on time.
- Watch the videos "Tor Hidden Devices" and "What Is the Dark Web?" (10 minutes).

- o Discussion: Web surfers and web producers are entirely anonymous using Tor and Bitcoins.
- o Why would someone use a Tor connection, the dark web, or Bitcoins?
- Research and debate (10 minutes)
- Cyber security vocabulary wall (5 minutes)
- Bonus work
  - o Read about cyber degrees: education and salary
  - o Read about end-to-end encryption
  - o Create a personal junk email account. Use this account when signing up for things that might sell your information, spam you, or send you other annoyances.
  - o AAUW and Symantec's Cyber Scribbles book has related decryption activities. You can print out copies for the students to work on in class or at home.
  - o At-home activity: Enigma simulator