### **Cyber Security**

### **Duration: 1 Week**

### **Summary**

This lesson covers the cyber security aspect of the Internet Big Idea. It includes videos describing cyber threats such loss of identity and personal information, and company wealth and intellectual property. It teaches prevention techniques such as strong passwords, resisting phishing and social engineering attacks, and multi-factor authentication. It also motivates the need to consider security when programming. The first video motivates the need for cyber security. The final video is a dramatization of a hack on a Las Vegas casino which is an entertaining illustration of cyber vulnerabilities, incident response, and the need for writing secure code. Other videos show the student about strong passwords, phishing and social engineering, and dual factor authentication.

The assignment has the student test the strength of passwords, use a tool to crack a weak password, and set up Google 2-factor authentication. It also has them write about cyber threats from the news.

### **Learning Objectives**

* Identify existing cyber security concerns, and potential options that address these issues with the Internet and the systems built on it. [AP CSP P1, 6.3.1]
* Describe an example (hack in Vegas) of how insecure code can be costly.
* Define authentication in the context of cyber security.
* Name several methods for authentication.
* Describe various password *cracking techniques.*
* Describe what makes a strong password.
* Define *social engineering* and describe an example of it.
* Analyze the beneficial and harmful effects of computing. [AP CSP P4, 7.3.1]

### **Course Material**

* Watch: [Cyber Security](https://www.youtube.com/watch?v=5k24We8pED8) [5:01]
* Read: [Cyber Security](http://computing-concepts.cs.uri.edu/index.php/Cyber_Security)
* Read: [Authentication](http://csf102.dfcsc.uri.edu/wiki/System_Fundamentals_For_Cyber_Security/Authentication)
* Watch: [Strong Passwords](https://www.youtube.com/watch?v=jeC_KzgPNk0) [1:45]
* Watch: [Passwords and Password Cracking](http://youtu.be/u_X2ay9IoSA) [12:43]
* Watch: [What is Two Factor Authentication](https://www.youtube.com/watch?v=0mvCeNsTa1g) [1:59]
* Watch: [Two-Factor Authentication - Google](https://www.youtube.com/watch?v=5bN77oz_TOo) [4:36]
* Watch: [Social Engineering](https://www.youtube.com/watch?v=hOxxTaBP3xs) [3:11]
* Watch: [Secure Programming Case Example](https://www.youtube.com/watch?v=7emSiphAlZg&feature=youtu.be) [28:32 min]

### **Assessments**

* Conceptual Quiz:
  + [Cyber Security and Authentication](https://docs.google.com/document/d/1xSQNzu3RecObZiJJ2Yqayqw3rtt9isqlcjkseh77stg/edit?usp=sharing) (requires access)
* Practical Assignment:
  + [Cyber Security](https://drive.google.com/open?id=12zU5vGrkrbdyKhEqC5wbsP4PIibPYc7jDQfki-oB2I4) | [Grading Rubric](https://drive.google.com/open?id=1pGp2q-NtziBL3Gb3tMo63B4xaBlAoPzm1KcJj7lwqu8) | [Answer Key](https://docs.google.com/document/d/1AXxT8k5Hdmqu8qatAIJbDnwroVto8uEvD18lWd7RpeY/edit?usp=sharing)