CERIAS

The Center for Education and Research in Information Assurance and Security

Teaching Cybersecurity in an Indiana 8th Grade Science Class

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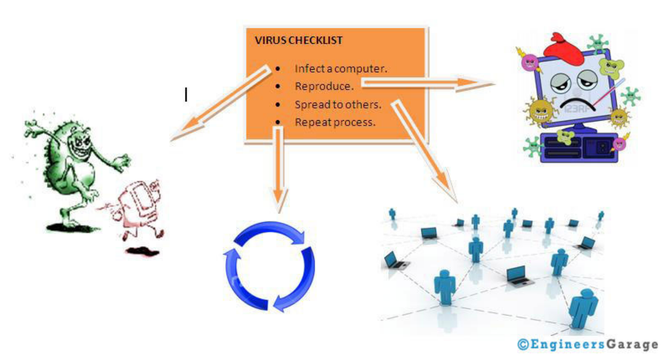
Introduction

Technology surrounds today's students so completely that they are unaware of the risks and dangers that it can pose for them.



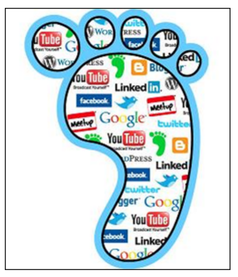
http://www.engineersgarage.com/sites/default/files/imagecache/Original/wysiwyg_imageupload/4214/computer.jpg

Problem Statement

To integrate cybersecurity lessons into the curriculum provided to 8th grade science students

http://www.careerrocketeer.com/wp-content/uploads/Digital-Footprint.png

Digital Footprint (Reputation)



Standard: **6-8.WS.1 Write arguments to focus on discipline-specific content.**
a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.

Lesson Summary:

- Students will participate in a lesson that helps students to identify characteristics of a positive digital reputation based on a lesson created on iiKeepSafe.

The Replicators

Standard: **8.3.1 Explain that reproduction is essential for the continuation of every species and is the mechanism by which all organisms transmit genetic information.**

Lesson Summary:

- Students will be provided direct instruction on how computer viruses and other malware are able to reproduce and spread
- Students will be able to compare and contrast the reproduction of biological organisms with those of electronic organisms

http://www.waterloo.k12.ia.us/staffsites/morlanr/files/2011/11/safety_logo-2fn9jto.png

Cybersecurity Overview

Standard: **Common practice to provide instruction on standard safety protocols in a laboratory.**

Lesson Summary:

- Students will receive direct instruction on general online safety topics via a PowerPoint
- Students will participate in a game/simulation with cybersecurity concepts as reinforcement
- Students will pass a cybersecurity quiz on the covered concepts

DNA is a code, like any text.
DNA + shift 3 cypher = GQD.

DNA

http://www.hartnell.edu/tutorials/biology/dnareplication.html

http://info.brandprotect.com/Portals/30658/images/email_phishing.jpg

Don't get caught Phishing

Standards: **6-8.RS.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases a they are used in a specific scientific context relevant to grades 6-8 texts and topics.**
6-8.RS.5 Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

Lesson Summary:

- Students will receive direct instruction on identifying key elements that distinguish a phishing email
- Students will be given a variety of emails, in which they will have to identify phishing elements and explain the nature of the letter
- Students will generate a list of possible phishing email topics based on their experiences and what things they might be fooled by

Deciphering the Code

Standard: *Core Standard* **Understand the predictability of characteristics being passed from parents to offspring. (8.3.1, 8.3.2, 8.3.3, 8.3.4, 8.3.5, 8.3.6, 8.3.7)**

Lesson Summary:

- Students will participate in a lesson that revolves around using the Caesar Cypher
- Students will be expected to apply their new knowledge about codes and cyphers towards a generation of modern applications
- Students will be able to draw comparisons between encoding in cybersecurity and the coding of traits within DNA

Indiana state science standards can be found at: http://www.doe.in.gov/standards/science

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