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| **Name: Samuel Mizener** | **Contact Info:** [**mizenersa@gmail.com**](mailto:mizenersa@gmail.com) | **Date: 7/28/16** |

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| **Lesson Title :** Vulnerabilities in Cyberspace | **Unit #:**  1 | **Lesson #:**  1 | **Activity #:**  1 |
| **Activity Title:** Importance of cybersecurity |

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| **Estimated Lesson Duration:** | 5 days |
| **Estimated Activity Duration:** | 2 days |

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| **Setting:** | Classroom |

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| **Activity Objectives:** |

The Student will be able to:

1. Based on FBI agent speaker’s presentation:
   1. Define cyberspace security
   2. Identify applications
   3. Provide examples of cyberspace vulnerabilities
2. Generate essential questionswhich create challenge

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| **Activity Guiding Questions:** |

1. What type of sensitive information is sent via cyberspace?
2. What is the role of the FBI in cybersecurity?
3. Why is it important to encrypt messages?

| **Next Generation Science Standards (NGSS)** | |
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| **Science and Engineering Practices (Check all that apply)** | **Crosscutting Concepts (Check all that apply)** |
| ☐ Asking questions (for science) and defining problems (for engineering) | ☐ Patterns |
| ☐ Developing and using models | ☐ Cause and effect |
| ☐ Planning and carrying out investigations | ☐ Scale, proportion, and quantity |
| ☐ Analyzing and interpreting data | ☐ Systems and system models |
| ☐ Using mathematics and computational thinking | ☐ Energy and matter: Flows, cycles, and conservation |
| ☐ Constructing explanations (for science) and designing solutions (for engineering) | ☐ Structure and function. |
| ☐ Engaging in argument from evidence | ☐ Stability and change. |
| ☐ Obtaining, evaluating, and communicating information |  |

| **Ohio’s Learning Standards for Science (OLS)** |
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| **Expectations for Learning - Cognitive Demands (Check all that apply)** |
| ☐ Designing Technological/Engineering Solutions Using Science concepts **(T)** |
| ☐ Demonstrating Science Knowledge **(D)** |
| ☐ Interpreting and Communicating Science Concepts **(C)** |
| ☐ Recalling Accurate Science **(R)** |

| **Ohio’s Learning Standards for Math (OLS) and/or**  **Common Core State Standards -- Mathematics (CCSS)** | |
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| **Standards for Mathematical Practice (Check all that apply)** | |
| ☒ Make sense of problems and persevere in solving them | ☒ Useappropriate tools strategically |
| ☐ Reason abstractly and quantitatively | ☐ Attendto precision |
| ☐ Construct viable arguments and critique the reasoning of others | ☒ Look for and make use of structure |
| ☐ Model with mathematics | ☒ Look for and express regularity in repeated reasoning |

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| **Unit Academic Standards (NGSS, OLS and/or CCSS):** |

* Foster increases in the number of Ohio citizens studying and working in STEM fields
* Foster increases in all students developing stronger skills in problem solving, innovation, and teamwork

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| **Materials**: |

* Handout to be completed by students during guest speaker

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| **Teacher Advance Preparation:** |

* Organize guest speaker
  + Roger Wilson – Retired FBI agent and co-founder of Red-eye task force
* Interview Questions (to be given to Roger Wilson prior to interview)
* Invite administrators to the interview

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| **Activity Procedures:** |

* Day 1
  + Welcome guest speaker and pass out handout to students
  + Describe the scope of our assignment
  + Begin interview (stopping periodically to give students time to ask questions)
  + End interview and thank guest speaker
  + Give students final opportunity to ask questions
* Day 2
  + Facilitate Think-Pair-Share with students based on their notes and “take-aways” from guest speaker
  + Generate essential questions and introduce challenge

**Formative Assessments:** Link the items in the Activities that will be used as formative assessments.

* The handout will be used for formatively assessing students understanding and level of engagement during the interview process

**Summative Assessments:** These are optional; there may be summative assessments at the end of a set of Activities or only at the end of the entire Unit.

* Pre-test

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| **Differentiation:** Describe how you modified parts of the Lesson to support the needs of different learners.  Refer to Activity Template for details. |

* None during the interview
* During the Think-Pair-Share discussion I will group students will similar learning styles to increase depth of engagement.

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| **Reflection:** Reflect upon the successes and shortcomings of the lesson. |

This activity went very well and student very engaged during the guest speaker. Student feedback included that hearing examples of how cybersecurity played a role in national security was very interesting and prompted them to consider going into a federal agency. This engagement really set up the second day of this activity because students had a lot of say during the Think-Pair-Share. They started asking the essential questions with very minor prompting. Overall, I would not change anything about this activity and plan to continue to bring in experts when covering other units as well.