

# Lesson Plan\*

## LESSON TITLE:

## SUMMARY:

This workshop introduces students to meaningful Cybersecurity projects which will contribute to student knowledge and skill sets which will educate and prepare the students for a power grid or communications failure (terrorist or natural disaster attack). Imagine if your local power grid and cellphone failed and you were left standing in the dark and isolated without telephone or Internet access?

This workshop provides answers and offers communications preparation resources and solutions. Prepared and FCC-licensed students saved lives and quickly helped police and emergency communications. Students were using hand-held communications equipment to help the police!

## GRADE BAND:

K-2

6-8

3-5

High School

## TIME REQUIRED:

minutes

## LESSON LEARNING OUTCOMES: Upon completion of this lesson, students will be able to:

### Outcome Examples

Design/Build	1). Design and Defend your local Power Grid and Communications Network
Test/Defend	2). Apply and use your knowledge of emergency communications during disasters
Compare/Contrast	3). Participate in local emergency communications and FCC-License ARES Club
Apply/Use	4). Identify and explain wireless signals & modulated spectra
Explain/Discuss	5). Describe why knowledge of mathematics is fun and decode encrypted messages
Identify/Describe	6). Demonstrate how engineers actually develop cellular and satellite smartphones!

## Materials List (i.e., string digital diary, raspberypi, web link, drone):

## Describe any Previous Knowledge that may be Required:

Problem Solving Skills, Basic Science & Math Skills, interest in STEM

## How will you facilitate the learning?

- Describe the Warm-up Activity:

The power grid and cellphone, and Internet failure actually happened Sept 20th, 2017 as Hurricane Maria struck Puerto Rico with 155 mph winds! Present slides & Walk Around (ask students questions):

"HUMANITARIAN ASSISTANCE IN PUERTO RICO POST-HURRICANE MARIA"

Describe the Focused Activity:

Presentations and DHS Recommendations:

Presentations and DHS Recommendations:

- 1). <https://spectrum.ieee.org/static/special-report-puerto-rico-after-the-storm>
- 2). Threats to Pharmaceutical Supply Chains:  
<https://www.dhs.gov/sites/default/files/publications/508%20-%20AEP%20Pharmaceutical%20Final%20w-DS%200792018.pdf>
- 3). 2017 Hurricane ARRL Report:  
<http://www.arrl.org/files/file/Public%20Service/ARES/2017%20Hurricane%20Season%20AAR.pdf>

**Mapping to GenCyber Cybersecurity First Principles**

- |   |                                       |
|---|---------------------------------------|
| <input type="checkbox"/> Domain Separation      | <input type="checkbox"/> Abstraction  |
| <input type="checkbox"/> Process Isolation      | <input type="checkbox"/> Data Hiding  |
| <input type="checkbox"/> Resource Encapsulation | <input type="checkbox"/> Layering     |
| <input type="checkbox"/> Modularity             | <input type="checkbox"/> Simplicity   |
| <input type="checkbox"/> Least Privilege        | <input type="checkbox"/> Minimization |

**Mapping to GenCyber Cybersecurity Concepts**

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Defense in Depth | <input checked="" type="checkbox"/> Availability            |
| <input checked="" type="checkbox"/> Confidentiality  | <input checked="" type="checkbox"/> Think Like an Adversary |
| <input checked="" type="checkbox"/> Integrity        | <input type="checkbox"/> Keep It Simple                     |

**Assessment of Learning**

**TYPE (Examples listed below)**

**NAME/DESCRIPTION**

Quiz/Test	
Presentation Project Writing Assignment Observation Walk Around Oral Questioning Other	A number of assessment approaches will be adopted:  1). Presentation of multiple cybersecurity and natural disaster scenarios  2). Oral questions and walking around  3). Q & A online and answer discussions

**Accommodations (Examples may include closed captioning for hearing impaired students, accommodations for students with disabilities)**

N/A
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**Describe any Extension Activities (i.e, ideas for further work):**

1) Join & Participate:

**\*\* Indiana County Emergency Management \*\***

FCC Training & License Testing: <https://www.qsl.net/w3bmd/>

Contact: N3QM, Bill McMillen, 724-397-2702, [wkmcmillen@gmail.com](mailto:wkmcmillen@gmail.com)

\*\*\*\*\*NOTE: YOU can help your local community!

**Acknowledgements**

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