



TECHNOLOGY CAMP

DAY 1 : CYBER SECURITY

Physical, Web & Network Security

Session 4



YELLOW CIRCLE INC
PO Box 2383
Elk Grove, CA 95759-2383

Teacher Lesson Plan

Physical, Web & Network Security

Session Name:

Physical, Web and Network Security

Summary:

Better level of security is achieved by implementing layers of security in cyber world. This session is subdivided into three sections: physical, web, and network security. This session provides information to students on the importance of physical security in the world of cyber security, including secure home, office, or enterprise that has security guards, fences, walls, camera systems, drones, biometrics, and more. Web security is as important as physical, as a hackable website or application is easier for hackers to breach as it does not require physical presence. Network security controls who and why someone needs to reach your business computer systems, phone systems, or physical systems. Firewalls and similar systems determine who has the right to come in and go out of a network, for how long, and how much they can utilize on the networks.

Time Allotment:

65 minutes

Learning Objectives:

- *Physical security in Cyber Security*
- *Buildings, Guards, Badging Systems, Biometrics including retina scans, fingerprints*
- *Web & Application security*
- *Security scanning of code, finding vulnerabilities in code, is your code hackable*
- *Network & access control*
- *Firewalls, Access Control Lists, Do you want or need access to data to do your job?*

Supplies:

- *Scrap paper / notepad to take notes*
- *Laptop / computer with Internet access to research topics*



YELLOW CIRCLE INC
PO Box 2383
Elk Grove, CA 95759-2383

Day 1 : Session 4
Page 2 of 6

Physical, Web & Network Security

Learning Activities:

- **(5 minutes) - Session overview**

Provide students session overview. Describe how session is divided into three subsections that covers physical security, web security, and network security. Inform students that each of these security mechanisms are important as multiple layers of security is very effective to keeping bad guys out and good people safe.

- **(6 minutes) - Video : Security at Google Data Center**

<https://www.youtube.com/watch?v=XZmGGAbHqa0>

- **(4 minutes) - Physical Security**

- *Start with discussion on why physical security is important in cyber security*
- *House without door does not provide security*
- *A door with 10 locks is now a pain for the owner to get in*
- *A datacenter with glass windows is not secure*
- *Discuss vault doors, brick / concrete walls, bulletproof security guard shacks, camera systems, biometrics.*
- *Re-enforce the topic that physical security is as important as cyber security. What if a bad person can just pick up a laptop from your house and walk away, all the additional security measures like passwords and firewalls are now useless?*

- **(5 minutes) - Student Activity : How secure is your home?**

Have volunteers pass worksheet to students.

Students will work in groups of 3-5 to list topics / mechanisms that make their home or school secure from bad people. Remind students that this is strictly physical security activity. This activity will not include network security of their home or school, and should only discuss items that apply to physical security of their home.



YELLOW CIRCLE INC
PO Box 2383
Elk Grove, CA 95759-2383

Day 1 : Session 4
Page 3 of 6

Physical, Web & Network Security

- **(5 minutes) - Class discussion on activity findings**

Select one or two groups and discuss their findings

- **(5 minutes) - Video : Web application Security / HTTP vs HTTPS**

<https://www.youtube.com/watch?v=kBzbKUirOFk>

Stop video anytime after 5 minutes

Discuss tools to discover web security flaws: Kali Linux, Nessus, WhatWeb

- **(10 minutes) - Web & Application Security**

Now that we know what physical security is, now it's time to discuss web, operating systems, and application security

- *Discuss how easy it is to hack websites, applications, and operating systems as they don't require physical access*
- *Hackers can just send a specially crafted email with a link that can infect your computer and make it accessible to bad people*
- *Hackers can collect keystrokes with virtual keyloggers, watch everything you do on the computer, and even turn on the microphone and camera on your computer without your knowledge or approval.*
- *Give brief explanation of terms like: Malware, Ransomware, Viruses*
- *Give brief explanation on how anti-virus and other security programs can help*
- *Teach students why it is important to thoroughly read email before clicking on the links, and installing programs that can potentially infect your computer, slow it down, and expose all your systems in your house to hackers.*
- *Difference between HTTP and HTTPS (plain text websites vs. secure sites)*
- *It is important to develop code that is secure.*



YELLOW CIRCLE INC
PO Box 2383
Elk Grove, CA 95759-2383

Day 1 : Session 4
Page 4 of 6

Physical, Web & Network Security

- **(5 minutes) - Class discussion activity**

Discuss how layers of protection help a company's data.

Why all entryways need to be protected?

- **(2 minutes) - Video: What is a firewall?**

<https://www.youtube.com/watch?v=x1YLj06c3hM>

Ask students if they know where a firewall is in their house

- **(5 minutes) - Network Security**

Provide an overview of what a firewall does to protect your home network, school network, and enterprise networks.

- *Use example of a firewall in house construction, or building construction. A firewall between a garage and a room protects the room from fire that started in a garage.*
- *Use terms like, doors in a house to teach students how a user from behind the firewall can reach Internet, and discuss in-bound traffic as allowing a friend to visit. Are all friends good? So be careful who you give the key to your front door.*
- *Different types of firewalls - hardware, software, virtual. Discuss how they are different and alike at the same time.*
- *Discuss extended features of modern day firewalls - protection from spyware, zero-day attacks, malware, viruses, and more.*

- **(10 minutes : Optional) - Lab: CEO of social media start-up**

Use laptops to finish activity 1 on PBS / NOVA Labs

<https://www.pbs.org/wgbh/nova/labs/lab/cyber/research#/newuser>

Students can stop after one round of attacks



YELLOW CIRCLE INC
PO Box 2383
Elk Grove, CA 95759-2383

Day 1 : Session 4
Page 5 of 6

Physical, Web & Network Security

- **(5 minutes) Closing / Wrap-up**

Remind students about the importance of:

- *Physical Security*
- *Web & Application Security*
- *Network Security*

- **(1 minutes) - What's next?**

Inform students that they are finished with Cyber Security day of the camp. Students can head back to the cafeteria to be picked up by their parents, and remind them to be back tomorrow for another fun day of learning. Day 2 is all about Mobile Application Development using Android.



YELLOW CIRCLE INC
PO Box 2383
Elk Grove, CA 95759-2383

Day 1 : Session 4
Page 6 of 6