HTTP vs. HTTPS

**Lesson Description:** In this learning module, the teachers will learn about the difference between HTTP and HTTPS. Hyper Text Transfer Protocol Secure (HTTPS) is the secure version of HTTP, the protocol over which data is sent between your browser and the website that you are connected to. The 'S' at the end of HTTPS stands for 'Secure'. It means all communications between your browser and the website are encrypted. Teachers will learn how to determine the security level through the URL

**Prerequisite Knowledge:** How to surf the World Wide Web with a computer.

**Length of Completion**: 45 minutes

**Level of Instruction:** High School or Middle school introductory level.

**Applicable First Principles &/or Concepts:**

**GenCyber First Principles**

Domain Separation Abstraction

Process Isolation Data Hiding

Resource Encapsulation Layering

Modularity Simplicity

Least Privilege Minimization

**GenCyber Cybersecurity Concepts**

Defense in Depth Availability

**Confidentiality** Think Like an Adversary

Integrity Keep it Simple

**Resources that are Needed:** A PC computer with internet connectivity, and a web browser.

**Accommodations Needed:** Instructions will be given verbally and on screen. Images will be used in PowerPoint to support student understanding. Students will have the opportunity to engage in small group discussion before whole-group share out. Other accommodations as needed

# learning outcomes

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* Explain the difference between HTTP and HTTPS (high level)
* Explain how SSL and TLS work (high level)
* Identify websites that use HTTPS versus HTTP

# Lesson Details

**Interconnection:** None

**Assessment:** Post exercise discussion

**Extension Activities:** None

**Differentiated Learning Opportunities:** None

# lesson 5.2

**Lesson 5.2 Details:**

**Warm Up:** Teachers will look up various websites they use for purchases, banking, etc to see if they are secure or not.

**Lesson:**

Instructor will demonstrate how to tell if a website is using secure communications. Teachers will perform their own research to find websites that use HTTP instead of HTTPS. Students will also perform tests on websites to see how secure their HTTPS functionality is compared to current standards and best practices.

- Describe the Teacher Instruction:

10 minutes for warm up, 15 minutes for slides / lecture, and 20 minutes for questions. The following topics will be discussed:

A. The Beginnings

1. What is the Internet

2. What is the Web

3. HTTP

B. Netscape Browser and Security

1. HTTPS

2. SSL

3. TLS

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