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# THE K-12 CYBER WAVE

A CURRICULUM FRAMEWORK FOR HIGH SCHOOL STUDENTS

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# AGENDA

- The Background
- The Framework
- The Closer Look
- The Second Phase
- The Access

# THE BACKGROUND

- Cyber Center for Education and Innovation
- Cybersecurity Curriculum Framework

# THE FRAMEWORK

- Cybersecurity Curriculum Framework
  - Why a Framework
  - Backwards Design/ AP CS Principles
  - What, not How

# THE FRAMEWORK

- Preface
- Essential Questions
- 8 Big Ideas
  - Enduring Understandings
    - Learning Objectives
    - Essential Knowledge



## THE CLOSER LOOK

### ■ Big Idea 3: Data Security

Data is all around us; keeping it secure and private is essential for individuals, groups, and governments. The concept of what data is, and how it can be collected, has changed monumentally with the advent of the Internet. With an ease of collection created by improved computing power, data can be generated, stored, transmitted, and manipulated at a much greater pace and at an almost immeasurable amount. Keeping those with malicious intent away from data assets and preserving privacy is a major tenet in Cybersecurity. Because data can tell us so much about our world, it is important to keep the confidentiality, integrity, and availability of the data intact. Students in this course will study relevant laws and policies governing data; evaluate the tools used to connect cyber-physical systems; and practice using the encryption techniques needed to secure data across networks.

## THE CLOSER LOOK

- Essential Questions:
  - What actions can be taken to validate that data has been unaltered by an unauthorized source?
  - What policies and procedures are in place to keep data safe?
  - How is the integrity of data being transported over networks safeguarded?
  - What are the ways in which data can be encrypted?
  - Why is privacy essential for individuals, groups, and governments?

## THE CLOSER LOOK

- **EU: Data security deals with the integrity of the data, i.e., the protection from corruption or errors; the privacy of data; and data confidentiality, i.e., it being accessible to only those who have access privilege to it.**
  - LO: Students will analyze existing data security concerns and assess methods to overcome those concerns.
    - EK: Data reveals much about people, their thoughts, and lives.
    - EK: Data can be used to help individuals, but it can also be exploited to harm individuals.
    - EK: Data must be protected in processing, transmitting and storage.
    - EK: The purpose of personal data protection is not to merely protect a person's data, but to protect the fundamental rights, freedoms, and welfare of persons who are related to that data.
    - EK: Data integrity means only authorized changes are made only by authorized people.
    - EK: Origin integrity means the original data is trustworthy, and its source is trusted to produce trustworthy data.
    - EK: Data confidentiality is about protecting data against unintentional, unlawful, or unauthorized access, disclosure, or theft.

# THE CLOSER LOOK

- **EU: Data Security uses non-technical and technical controls and techniques to protect data that is being processed, transmitted and stored.**
  - LO: Students will compare and contrast data protection legislation, policies, and procedures that have been or are being introduced all over the world to protect personal data.
    - EK: Policies can be introduced and enforced at the local, state, and national levels.
    - EK: Laws are in place to protect the disclosure and misuse of financial, personal, and private information.
    - EK: GDPR (General Data Protection Regulation) is a set of regulations designed to give citizens in the European Union more control over their personal data.
    - EK: HIPAA (Health Insurance Portability and Accountability Act of 1996) is United States legislation that provides data privacy and security provisions for safeguarding medical information.
    - EK: CFFA (Computer Fraud and Abuse Act) prohibits accessing a computer without authorization, or in excess of authorization.
    - EK: CCPA (California Consumer Privacy Act) was signed into law in 2018. It is intended to extend the privacy rights of the citizens of California.
    - EK: An Acceptable Use Policy is a set of rules applied by the owner, creator or administrator of a network, website, or service, that restrict the ways in which the network, website or system may be used and sets guidelines as to how it should be used.

# THE CLOSER LOOK

- **EU: Data Security uses non-technical and technical controls and techniques to protect data that is being processed, transmitted and stored.**
- LO: Students will identify physical controls that are used to secure data.
  - EK: Physical security controls are means and devices to control physical access to sensitive information and to protect the availability of the information.
  - EK: Physical security is an important part of defense in depth. To provide comprehensive physical security, multiple systems and process must work together, like perimeter security, access control, and process management.
  - EK: Commonly used physical controls include: limited entry points, redundant systems, and surveillance cameras.
  - EK: A cyber-physical system (CPS) orchestrates networked computational resources with physical systems.
  - EK: A cyber-physical system (CPS) is a mechanism that is controlled or monitored by computer-based algorithms, tightly integrated with the Internet and its users.
  - EK: Industries that employ CPS include energy management, health care, manufacturing, transportation, telecommunications, infrastructure, and military.

## THE SECOND PHASE



# THE SECOND PHASE - PARTNERSHIPS

- What can we do to help build the pipeline?

	Advanced Placement	Dual Credit/Enrollment
Advantages		
Disadvantages		

# THE ACCESS

- How to see the entire framework
  - <https://cryptologicfoundation.org/visit/goal/cybersecurity-curriculum-framework-overview.html>
- We'd love to have you involved
  - Piloting this framework – January 1 – February 28, 2020
  - Partnering
  - Other?

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