



Mrs. Gentile's Lesson Plan
I.U.P. GenCyber Combination Camp
Thursday, June 21, 2018 9:00-10:50

Lesson Title: Introduction to SQL and College Trends in Data-Based Majors

Summary: Students will explore SQL with a tutorial on Khanacademy. Algorithmic and computational thinking drive their exploration as they complete customizable assessments within Khanacademy. Basic examples of Cyber-Security First Principles will be applied throughout their learning. Discussion of 21st Century skills, digital literacy skills and data literacy skills will lead to discussion of workplace skills and thus trends in college majors.

Grade Band:

9-12th Grade Students

Time Required:

Two 50-minute sessions

Lesson Learning Objectives/Outcomes:

Upon completion of this lesson, students will be able to:

- Apply Cyber-Security Principles to the topics of data management and data analysis in SQL.
- Create simple tables and queries using SQL.
- Understand the importance of certain operators and statements in SQL.
- Identify related careers and college majors to data management and cyber security.

Materials List:

Computers w/Internet
Projection Screen

How will you facilitate the Learning?

Session 1:

- 1) Using Google Slides, students will be given motivation for learning SQL and other digital literacy skills as an introduction.
- 2) Students will be asked log into www.khanacademy.org to independent study SQL and progress as far as possible until breaktime. All the while, I will assist them as they work on each challenge.

Session 2:

- 1) Before students resume their independent study, we will discuss the purposes of using data management systems from their experiences –

whether they realize them or not. (In gaming, for log-in validation, website use, business intelligence, testing computer function).

- 2) Ask for and/or provide clear examples to the Cyber Security Principles of domain separation, abstraction, data hiding, layering, simplicity and least privilege.
- 3) Allow students to get as far as they can in their studies with the goal of at least learning how to use CASE statements, if possible.
- 4) Return to the Google Slide to summarize how SQL fits into software engineering and many related careers.
- 5) Conclude the lesson with trends in college courses related to cyber-security and data management

Mapping to bold-faced Cyber Security First Principles:

Domain Separation

Process Isolation

Resource Encapsulation

Modularity

Least Privilege

Abstraction

Data Hiding

Layering

Simplicity

Minimization

Assessment of Learning:

TYPE:

Observations

Oral Questioning

Name/Description:

On-task completion of SQL challenges

Answers to my prompts

Accommodations: Differentiated complexity in khanacademy challenges for more able students, and the use of provided clues or my assistance for students with less experience in coding

Description of Extension Activities: Students will be encouraged to explore further topics in the Khanacademy SQL list specifically, or even in the wealth of computer science and computer programming topics available on Khanacademy.

Acknowledgements:

www.khanacademy.org