

Cybersecurity for the High School Student

Curriculum was delivered to:

- Introduction to Computer Concepts (2 – 1 semester classes)
- Computer Science 1 (2 – Full Year classes)
- Introduction to Robotics (1 Full Year Class)

150 Students participated in the lessons this year.



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RET Site: Cyber Security Initiative for Nevada Teachers (CSINT)

Daily Lesson Plans - Lesson 1

Instructional Days: 1

Topic Description: How does a computer work? In this lesson the students explore how a computer does what it's told to do.

Objectives:

The students will be able to:

- Describe the process a computer uses to accomplish a task.
- Recognize binary numbers and ASCII representations.

Outline of the Lesson:

- Students write initials as a team (15 minutes)
- The computer is a problem solving machine lecture (30 minutes) (File 2)
- Students write their name in hexadecimal code (10)

Student Activities:

- Teams of two students attempt to write their initials on a whiteboard
- Students analyze a binary card trick and see how it works
- Students translate their first and last names into hexadecimal code.

Teaching/Learning Activities:

- Students write their initials as a team: The computer program (student 1) instructs the CPU (student 2) how to write initials on a white board.
 - Split the students into teams of two. Preferably, students that are unfamiliar with each other so to get to know each other better. One student will be the CPU which carries out the instructions and the other will be the program that gives the CPU instructions.
 - Take each group aside and instruct the CPU's to do only what they are told and instruct the computer programs to be exact with their instructions.
 - **If you do not have enough markers or chalk, then have one group do the work, it is very entertaining to watch a pair of students perform this job.**
- Lecture: The Computer is a Problem Solving Machine. PowerPoint supplied.
 - The lecture is to inform the students how a computer is a problem solving machine in general terms. It covers:
 - Identifying programs that students know, and try to determine the problems they are trying to solve.
 - Computers don't speak our language so how do we communicate with them.
 - Computers need to REPRESENT information in the computer using binary and hexadecimal values.
 - A brief look at the 10, 16 and 2 base number systems
 - Have a binary number trick explain base 2 numbers
 - Investigate how our keyboards use the hexadecimal system to communicate with the computer
- Students translate First and Last name from alpha characters to hexadecimal: Learn how characters are translated into hexadecimal (ASCII) codes.
 - Students will locate a character to hexadecimal converter on the internet and convert their names.
 - They will paste that string of hex characters into the comment box on as LMS of the teachers choice.

Resources:

- The Computer is a Problem Solving Machine (PowerPoint)
- Binary Card Trick (PDF)

Notes for Future:

1. Students need more time grasping the basics of number systems. A vocabulary (reminder) about how we used the decimal system seems to help. Students know how to talk about the numbers but they do not understand why our decimal numbers are the way they are. For example, how is it that 555 is 555, $500+50+5$. After comprehension then you can move to other number systems.

