

Intro to Cybersecurity

9th – 12th

Prepared by:

Danielle Vandenberghe

Superintendent of Schools:

Marie C. Cirasella, Ed.D.

Approved by the Midland Park Board of Education on ,

August 22, 2022

Intro to Cybersecurity

Course Description:

Introduction to Cybersecurity is a 1/2 year course for high school students. The intent is to introduce students to basic cybersecurity concepts and inspire interest in cybersecurity careers. This course needs no advance knowledge in computing or cybersecurity for the student. Students will learn the fundamentals of Cybersecurity which include what makes systems vulnerable, how to secure systems, and what tools are used against companies and individuals. The course will also discuss the ethics and laws behind Cybersecurity and how security vs privacy is a fine line. This course is designed to get students interested in Cybersecurity; a continuously growing field of study.

Course Sequence:

Unit 1 – Foundations & Threats: 4 weeks

Unit 2 – Human Factor: 2 weeks

Unit 3 – Data Safety & Best Practices: 2 weeks

Unit 4 – Cryptography & Linux: 5 weeks

Unit 5 – Devices & Networks: 5 weeks

*Additional days can be spend on free Cyber competition activities.

Pre-requisite: None

Unit 1 - Overview

Core Ideas: To identify primary methods of authentication and define password attacks using database information, look at different types of malicious code and learn the basics of command line interfaces.

Unit 1 - Standards

8.1.12.NI.4 Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.

8.1.12.IC.3 Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.

8.12.CS.1 Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.

[REDACTED]
[REDACTED]
[REDACTED] 9.2.12.CAP.2 Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.

9.2.12.CAP.8 Determine job entrance criteria (e.g., education credentials, math/writing/reading comprehension tests, and drug tests) used by employers in various industry sectors.

[REDACTED]
9.4.12.IML.7 Develop an argument to support a claim regarding a current workplace or societal/ethical issue such as climate change

[REDACTED]
9.4.12.CT.1 Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).

9.4.12.CT.2 Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a.)

9.4.12.DC.3 Evaluate the social and economic implications of privacy in the context of safety, law, or ethics (e.g., 6.3.12.HistoryCA.1).

9.4.12.DC.4 Explain the privacy concerns related to the collection of data (e.g., cookies) and generation of data through automated processes that may not be evident to users (e.g., 8.1.12.NI.3)

[REDACTED] 9.4.12.DC.8

Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection.

[REDACTED]
9.4.12.IML.9 Analyze the decisions creators make to reveal explicit and implicit messages within information and media (e.g., 1.5.12acc.C2a, 7.1.IL.IPRET.4.)

9.4.12.TL.1 Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).

[REDACTED]
LGBTQ and Disabilities NJSA 18A:35- 4.35

security and what can be done about it.

Amistad Law NJSA 18A:35- 4.43

Explore LGBTQ owned cyber security companies, including but not limited to Social Driver, PBJ Marketing and Concentric Design.

Explore African-American owned cyber security companies, including but not limited to AGB Investigative Services, Lumu, and Silver Shield Security

Students will learn about how bias plays a part in cyber

Holocaust Law NJSA 18A:35- 28	Explore Jewish owned cyber security companies, including but not limited to SentinelOne, Check Point Software Technologies, and Touch.io
-------------------------------	--

AAPI Law NJSA 18A:25- 4.44
Midland Park Public Schools

Explore Asian-American and Pacific Islander owned cyber security companies, including but not limited to Antiy Labs, CYFIRMA, i-Sprint and ThreatBook

[REDACTED]
[REDACTED]
[REDACTED]
Science HS ETS1-1
Science
HS-ETS1-3

Science
HS-ETS1-4 History
6.1.12.SE.14.a

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal need and wants.

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. Explore the various ways women, racial and ethnic minorities, the LGBTQ community, and individuals with disabilities have contributed to the American economy, politics and society

- NJSLSA.SL1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
- NJSLSA.SL2 Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address a question or solve a problem.
- RST.11-12.9 Synthesize information from a range of sources (e.g. texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Self-Awareness Examining prejudices and biases
 Having a growth mindset

Self
Management Social
Awareness Relationship Skills

Responsible Decision
Making

- Exhibiting self-discipline and self-motivation
- Using planning and organizational skills
- Taking others' perspectives
- Understanding the influences of

- organizations/systems on behavior
- Communicating effectively
 - Practicing teamwork and collaborative problem-solving
 - Showing leadership in groups
 - Demonstrating curiosity and open-mindedness
 - Recognizing how critical thinking skills are useful both inside & outside of school

Unit Essential Question(s):

- What is CIA Triad?
- What is authentication and how does it work?
- What is malicious code and what does it do?
- What is a command line interface

- Students will understand how to achieve CIA
- Students will understand how authentication works
- Students will understand what malicious code can do
- Students will understand how to use a command line interface using a Virtual Machine

Unit Enduring Understandings:

Evidence of Learning

Formative Assessments:

- Do Now
- Teacher observations
- Questioning
- Quizzes
- Practice Programs
- Entry tickets
- Exit tickets
- Online games
- Discussions

Midland Park Public Schools

- Homework

Summative/Benchmark Assessment(s):

- Projects
- Tests
- Chapter Review / Quizzes
- Chapter Assignments
- Labs
- Final Project

Alternative Assessments:

- Portfolio
- Projects
- Online tests / assignments

Resources/Materials:

Garden State Cyber Security Curriculum
 Key Vocabulary: Cybersecurity, CIA Triad, Confidentiality, Integrity, Availability, Authentication, Access Control, Accounting, Password, Single Sign-On (SSO), Breach, Database, Dictionary Attack, Brute force attack, Hybrid Attack, Password Spraying, Credentials, Credential Stuffing, Identify Proofing, Passphrases, Hashing, Rainbow Tables, Hash collision, Birthday Attack, Smart Cards, Certificate, Algorithm, Biometrics, Malware, Virus, Boot Sector Virus, Macro Virus, Program Virus, Armored Virus, Worm, Polymorphic Code, Trojan, RAT – Remote Access Trojan, Backdoor, BOTNET, Logic

Bomb, Rootkit, Zero Day, Vulnerability Window, APT – Advanced Persistent Threat, Exfiltrate, Ransomware, Spyware, Adware, PUP / PUA, SPAM, Virtualization, Hypervisor, Host, Host OS, Virtual Machine, Virtualization software, Command Line, Graphical User Interfaces, Linux, Specialized operating system, Terminal, Prompt, Path, UNIX

Suggested Pacing Guide

Lesson Name/Topic
 Student Learning Objective(s)
 Suggested Tasks/Activities: Day(s) to Complete

<p>Introduction to course & Ethics Agreement</p>	<ul style="list-style-type: none"> Explore reasons for pursuing a cybersecurity career Understand content of coursework Understand the class Ethics agreement 	<ul style="list-style-type: none"> Students will consider what should be in a Code of Behavior for the Cybersecurity Course. They will create a document that answers the questions in the PPT Slide: <ul style="list-style-type: none"> Why do we need a Code of Behavior for our Cybersecurity Course? What actions should not be allowed? Think about these categories: Passwords, Network or Wifi, Files or online accounts, Writing Code, Configuring devices 	<p>1 Day</p>
--	--	--	--------------

consequences be for those actions?

☞ How does that differ if there was no intent to harm or if it was just a joke?

☞ Review Ethics Agreement and have it signed by parent/guardian and student

Intro to Security Concepts
☞ Identify the key goals and frameworks of Cybersecurity
☞ Identify the CIA Triad as the characteristics of information

☞ Identify the states of information as stored, transmission and processing
☞ Activity: CIA Triad Scenarios worksheet – students practice their understanding of the

CIA triad by selecting the appropriate characteristic for each scenario
☞ Activity: CIA Triad Card Game – divide students in pairs or

teams. For 9 scenarios they will decide which CIA triad characteristic and which Data State applies. Fun to do as a competition.
1 Day

methods of authentication
☞ Apply best practices for creating a safe password

☞ Lab: Testing Password Strength students' work in pairs to create a password according to criteria and then test it.

☞ Activity: Creating a Safe Password - students should follow the steps to create the

password and then create a colorful poster.
1 Day

Authentication ☞ Identify primary

Password Attacks
☞ Identify primary methods of authentication
☞ Define password attacks using database information
☞ Activity: Have You Been Pwned - apply

the Have I Been Pwned tool to check whether an email address has appeared in any data breaches and use this information to increase personal online security.
1 Day

Authentication &

<p>Password Hashing</p>	<ul style="list-style-type: none"> 📖 Recognize authentication vocabulary terms 📖 Understand methods of secure password storage 📖 Define hash as a method of one way encryption 	<ul style="list-style-type: none"> 📖 Activity: Hashing & Salts with CyberChef: Students work with a partner to prove that adding a salt to a password will protect against Rainbow Attacks. Students will use the CyberChef app which is available through a browser 📖 NIST Password Guidelines worksheet – read short articles on the updated recommendations for safe 	<p>1 Day</p>
-------------------------	---	---	--------------

Midland Park Public Schools

<p>Methods of Authentication</p>	<ul style="list-style-type: none"> 📖 Demonstrate an understanding of various methods of authentication 	<p>passwords. Complete worksheet questions.</p>	<p>for each asset. Write a short summary explaining the reasons for</p>
<p>Malicious Code Part 1</p>	<ul style="list-style-type: none"> 📖 Make a convincing argument as to what methods of authentication would best accomplish their assigned goal 	<ul style="list-style-type: none"> 📖 Identify the types of malicious software that exist and how they can be layered to increase the security threat. 📖 Examine how malware has a negative impact on a computer system and also on a person. 	<p>selection.</p> <ul style="list-style-type: none"> 📖 Compile information into a document that takes the form of Client Recommendation Report. <p>Project: Historic Malware Research</p> <p>Each student will be assigned a historic malware. Go online to research the provided</p>
<p>Malicious Code Part 2</p> <ul style="list-style-type: none"> 📖 Define alternatives to passwords for authentication 	<ul style="list-style-type: none"> 📖 Identify the types of malicious software that exist and how they can be layered to increase the security threat. 📖 Examine how malware has a negative impact on a computer system and also on a person. 	<ul style="list-style-type: none"> 📖 Summarize the best practices for protecting against malicious software Project: Which Authentication? - 📖 Students work in groups of 2 -4 📖 Groups are given a list of physical and digital assets and a list of authentication methods. 📖 Task is to make best selection of authentication method 	<p>questions and create a summary document that can be used as notes to present to class.</p> <ul style="list-style-type: none"> 📖 Presentations on Historic Malware: Students present in small groups in speed rotation 📖 Activity: Rapper or Malware Game : Students will work

together to decide if something is a rapper or malware based on the clues
3 Days

4 Days 2 Day

Virtualization 📄 Identify the characteristics of virtualization software
📄 Apply steps to open and configure

Virtual Machines
📄 Confirm access to online course
VMs
📄 Lab: Online Virtual Machine Access - This lab is used to

confirm that all students can successfully access the course VMs in the NetLab environment.
2 Day

<p>Command Line Interface – Linux</p>	<p>📄 Identify the four types of Operating systems and their primary uses 📄 Recognize the reasons for using a system in Command Line Interface</p>	<p>📄 Activity: Terminus-Terminus is a text-based game to practice Linux commands.</p>	<p>4 Days</p>
---------------------------------------	---	---	---------------

Midland Park Public Schools
📄 Kahoot Game Review of Linux terms

📄 Identify the basic CLI commands for file access and manipulation for Linux

Teacher Notes: This curriculum all comes from the Garden State Cybersecurity Curriculum. Make sure to check links for anything that would need to be white listed before lessons.
Additional Resources:

Differentiation/Modification Strategies

Students with Disabilities
English Language Learners

Gifted and Talented

Students
Students at Risk

504Students

<ul style="list-style-type: none"> • Allow errors • Rephrase questions, directions, and explanations • Allow extended time to answer questions and permit drawing as an explanation • Accept participation on any level, even one word • Consult with Case Managers and follow IEP accommodations/modifications 	<ul style="list-style-type: none"> • Assign a buddy, same language or English speaking • Allow errors in speaking • Rephrase questions, directions, and explanations • Allow extended time to answer questions • Accept participation at any level, even one word 	<ul style="list-style-type: none"> • Provide extension activities • Build on students' intrinsic motivation • Consult with parents to accommodate students' interests in completing tasks at their level of engagement 	<ul style="list-style-type: none"> • Provide extended time to complete tasks • Consult with Guidance Counselors and follow I&RS procedures/action plans • Consult with other members of the 7th grade team for specific behavior interventions • Provide rewards as necessary 	<ul style="list-style-type: none"> • Allow errors • Rephrase questions, directions, and explanations • Allow extended time to answer questions and permit drawing as an explanation • Accept participation on any level, even one word • Consult with Case Managers and follow IEP accommodations/modifications • Assign a buddy, same language or English speaking
--	--	---	---	---

Midland Park Public Schools

Unit 2 - Overview

[Redacted text]

Unit 2 - Standards

[Redacted text]

9.2.12.CAP.2 Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.

9.2.12.CAP.8 Determine job entrance criteria (e.g., education credentials, math/writing/reading comprehension tests, and drug tests) used by employers in various industry sectors.

9.4.12.CT.1 Identify problem-solving strategies used in the development of an innovative product or practice

(e.g., 1.1.12acc.C1b, 2.2.12.PF.3).

9.4.12.CT.2 Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).

9.4.12.DC.3 Evaluate the social and economic implications of privacy in the context of safety, law, or ethics (e.g., 6.3.12.HistoryCA.1).

9.4.12.DC.4 Explain the privacy concerns related to the collection of data (e.g., cookies) and generation of data through automated processes that may not be evident to users (e.g., 8.1.12.NI.3)

9.4.12.DC.6 Select information to post online that positively impacts personal image and future college and career opportunities.

9.4.12.DC.8 Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection.

9.4.12.IML.9 Analyze the decisions creators make to reveal explicit and implicit messages within information and media (e.g., 1.5.12acc.C2a, 7.1.IL.IPRET.4).

9.4.12.TL.1 Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).

LGBTQ and Disabilities NJSA 18A:35- 4.35

Amistad Law NJSA 18A:35- 4.43

Holocaust Law NJSA 18A:35- 28

AAPI Law

NJSA 18A:25- 4.44

Explore LGBTQ owned cyber security companies, including but not limited to Social Driver, PBJ Marketing and Concentric Design.

Students will learn about how bias plays a part in cyber security and what can be done about it.

including but not limited to AGB Investigative Services, Lumu, and Silver Shield Security

Explore Jewish owned cyber security companies, including but not limited to SentinelOne, Check Point Software Technologies, and Touch.io

Explore Asian-American and Pacific Islander owned cyber security companies, including but not limited to Antiy Labs, CYFIRMA, i-Sprint and ThreatBook

Explore African-American owned cyber security companies,

[Redacted text]

Science HS ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal need and wants.
----------------------	---

Science
HS-ETS1-3

Science
HS-ETS1-4 History
6.1.12.SE.14.a
Midland Park Public Schools

Evaluate a solution to a complex real-world problem based

NJSLSA.SL1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

NJSLSA.SL2 Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address a question or solve a problem.

on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. Explore the various ways women, racial and ethnic minorities, the LGBTQ community, and individuals with disabilities have contributed to the American economy, politics and society

RST.11-12.9 Synthesize information from a range of sources (e.g. texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Self-Awareness ■ Examining prejudices and biases
■ Having a growth mindset

Self
Management Social
Awareness Relationship Skills

organizations/systems on behavior ■
Communicating effectively
■ Practicing teamwork and collaborative
problem-solving

Responsible Decision
Making
■ Exhibiting self-discipline and self-motivation
■ Using planning and organizational skills
■ Taking others' perspectives
■ Understanding the influences of

■ Showing leadership in groups
■ Demonstrating curiosity and
open-mindedness
■ Recognizing how critical thinking skills are
useful both inside & outside of school

Unit Essential Question(s):

- What is social engineering and how is it used? ■ What is phishing?
- Why are humans a risk to digital security?

- engineering is and how it is used
- Students will gain knowledge on how phishing is used
- Students will have a better understanding how humans risk digital security

Unit Enduring Understandings:

- Students will understand what social

Evidence of Learning

Formative Assessments:

- Do Now
- Teacher observations
- Questioning
- Quizzes
- Practice Programs
- Entry tickets
- Exit tickets
- Online games
- Discussions
- Homework

Summative/Benchmark Assessment(s):

- Projects
- Tests
- Chapter Review / Quizzes
- Chapter Assignments
- Labs
- Final Project

Midland Park Public Schools

Alternative Assessments:

- Portfolio
- Projects
- Online tests / assignments

Resources/Materials:

Garden State Cyber Security Curriculum

Key Vocabulary:

Social Engineering, Hacking, Baiting, Shoulder surfing, Reverse Social Engineering, Hoaxes, Mitigate

Piggybacking, Dumpster diving, Vishing, Pretexting, Scareware, Phishing, Spear-phishing, Whaling, BEC-Business Email Compromise, Smishing, OSINT,

Suggested Pacing Guide

Student Learning Objective(s) Suggested
Tasks/Activities: Day(s) to Complete

Lesson

Name/Topic

Social Engineering
 ■ Define the steps used in typical digital attacks
 ■ Define social engineering as the human risk in organization security ■
 Identify techniques for

social engineering and an attack” on it.
 how to mitigate against these techniques
 ■ Activity: Sort the 7 Steps of Hacking - Divide students into groups of 2 or 3. Distribute to each group a set of 7 slips of paper, each slip has one of the “7 Steps of primary tool social engineering
 ■ Identify the special types and characteristics of phishing
 ■ Activity: Phishing IQ Test o Students each take Google Phishing Quiz website

enters their credentials into the fake site, the SET tool captures those credentials and displays them behind the scenes (all done using a virtual machine with no access to the actual internet)
 2 Day

(<https://phishingquiz.withgoogle.com/>)

o Students go to the Cornell Phishbowl

(www.it.cornell.edu/security/phishbowl.cfm) to see current examples of phishing email.

1 Day

Phishing ■ Define phishing as a

OSINT	■ Investigate open source online tools (OSINT) used to perform reconnaissance	■ Activity: OSINT Report on Tony Stark o Students will practice using OSINT tools. o They will complete a report on the target,	1 Day
-------	---	---	-------

Midland Park Public Schools

Tony Stark by looking at mock online info

Phishing Myself Project

Mitigating the Human Risk

- Investigate open source online tools (OSINT) used to perform reconnaissance
- Define ways in which humans present a risk to digital systems
- Examine use of policies, procedures and security awareness as mitigation tools.

Activity: Phishing Myself – Students will use OSINT online search tools to perform research about themselves (aka the target) to determine what information about them is publicly available online.

Activity – Students will read SANS Clean Desk Policy and then practice finding security mistakes in their own investigation.

3 Days 1 Day

Teacher Notes: This curriculum all comes from the Garden State Cybersecurity Curriculum. Make sure to check links for anything that would need to be white listed before lessons.

Additional Resources:

Differentiation/Modification Strategies

Students with Disabilities Learners Students 504Students
 English Language Gifted and Talented Students at Risk

<ul style="list-style-type: none"> Allow errors Rephrase questions, directions, and explanations Allow extended time to answer questions and permit drawing as an explanation Accept participation on any level, even one word Consult with Case Managers and follow IEP accommodations/modifications 	<ul style="list-style-type: none"> Assign a buddy, same language or English speaking Allow errors in speaking Rephrase questions, directions, and explanations Allow extended time to answer questions Accept participation at any level, even one word 	<ul style="list-style-type: none"> Provide extension activities Build on students' intrinsic motivation Consult with parents to accommodate students' interests in completing tasks at their level of engagement 	<ul style="list-style-type: none"> Provide extended time to complete tasks Consult with Guidance Counselors and follow I&RS procedures/action plans Consult with other members of the 7th grade team for specific behavior interventions Provide rewards as necessary 	<ul style="list-style-type: none"> Allow errors Rephrase questions, directions, and explanations Allow extended time to answer questions and permit drawing as an explanation Accept participation on any level, even one word Consult with Case Managers and follow IEP accommodations/modifications Assign a buddy, same language or English speaking
--	--	---	---	---



Unit 3 - Standards

8.1.12.NI.4 Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.

9.2.12.CAP.2 Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.
9.2.12.CAP.8 Determine job entrance criteria (e.g., education credentials, math/writing/reading comprehension tests, and drug tests) used by employers in various industry sectors.

9.4.12.CT.1 Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).

9.4.12.CT.2 Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).

9.4.12.DC.3 Evaluate the social and economic implications of privacy in the context of safety, law, or ethics (e.g., 6.3.12.HistoryCA.1).

9.4.12.DC.4 Explain the privacy concerns related to the collection of data (e.g., cookies) and generation of data through automated processes that may not be evident to users (e.g., 8.1.12.NI.3)

9.4.12.DC.8 Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection.

9.4.12.IML.9 Analyze the decisions creators make to reveal explicit and implicit messages within information and media (e.g., 1.5.12acc.C2a, 7.1.IL.IPRET.4).

9.4.12.TL.1 Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).

LGBTQ and Disabilities NJSA 18A:35- 4.35

Amistad Law NJSA 18A:35- 4.43

Holocaust Law NJSA 18A:35- 28

AAPI Law

NJSA 18A:25- 4.44

Explore LGBTQ owned cyber security companies, including but not limited to Social Driver, PBJ Marketing and Concentric Design.

Students will learn about how bias plays a part in cyber security and what can be done about it.

Explore African-American owned cyber security companies,

including but not limited to AGB Investigative Services, Lumu, and Silver Shield Security

Explore Jewish owned cyber security companies, including but not limited to SentinelOne, Check Point Software Technologies, and Touch.io

Explore Asian-American and Pacific Islander owned cyber security companies, including but not limited to Antiy Labs, CYFIRMA, i-Sprint and ThreatBook

Science HS
ETS1-1

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal need and wants.

Science
HS-ETS1-3



Science
HS-ETS1-4 History
6.1.12.SE.14.a
Midland Park Public Schools

Evaluate a solution to a complex real-world problem based

on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.





Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. Explore the various ways women, racial and ethnic minorities, the LGBTQ community, and individuals with disabilities have contributed to the American economy, politics and society






- NJSLSA.SL1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
- NJSLSA.SL2 Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address a question or solve a problem.
- RST.11-12.9 Synthesize information from a range of sources (e.g. texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Self-Awareness  Examining prejudices and biases
 Having a growth mindset




Self
Management Social
Awareness Relationship Skills

Responsible Decision
Making



-  Exhibiting self-discipline and self-motivation
-  Using planning and organizational skills
-  Taking others' perspectives
-  Understanding the influences of

- organizations/systems on behavior 
- Communicating effectively
-  Practicing teamwork and collaborative problem-solving
-  Showing leadership in groups
-  Demonstrating curiosity and open-mindedness
-  Recognizing how critical thinking skills are useful both inside & outside of school

Unit Essential Question(s):

-  What part of a systems infrastructure is vulnerability?
-  How can we keep systems from vulnerabilities?
-  How is new technology vulnerability?

Unit Enduring Understandings:

-  How to keep systems safe from vulnerability
-  How new technology can be kept safe

Evidence of Learning

Formative Assessments:

- Do Now
- Teacher observations
- Questioning
- Quizzes
- Practice Programs
- Entry tickets
- Exit tickets
- Online games
- Discussions
- Homework

Summative/Benchmark Assessment(s):

- Projects
- Tests
- Chapter Review / Quizzes
- Chapter Assignments
- Labs
- Final Project

Alternative Assessments:

- Portfolio

Midland Park Public Schools

- Projects
- Online tests / assignments

Resources/Materials:

Garden State Cyber Security Curriculum

Key Vocabulary:

Policy, Devices, Attack Vectors, Mitigate, Procedure, Benchmarks, Vulnerability assessment, Patch / Update, Hotfix, Critical, Security, Service Pack, Real-Time

protection, Additional settings, Scan, Ransomware protection, Firewall, User Access Control, Services, Least Privilege Principle, Backup, Redundancy, System image **Suggested Pacing Guide**

Lesson

Name/Topic

Student Learning Objective(s) Suggested Tasks/Activities: Day(s) to Complete

<p>System Vulnerabilities</p>	<ul style="list-style-type: none"> Identify commonly seen types of vulnerabilities 	<p>system.</p>	<p>directions</p>
<p>System Hardening Part I</p>	<ul style="list-style-type: none"> Examine how the Common Vulnerability and Exposure database can be used as a research tool. 	<ul style="list-style-type: none"> Apply host-based defensive tools to secure user access and backups Mitigate risk of third-party applications 	<p><u>o Presentation of posters</u></p> <ul style="list-style-type: none"> Lab: CIS-CAT Vulnerability Scan o Use the CIS-CAT assessment tool to scan the Windows 10 system to determine the effect of the hardening steps
<p>System Hardening Part II</p>	<ul style="list-style-type: none"> Identify host-based defensive tools to harden and restrict access Apply a vulnerability assessment tool and use results to secure a 	<ul style="list-style-type: none"> Activity: Product Analysis with CVE Poster - group project Teams will research and analyze data and create a poster based on the 	<ul style="list-style-type: none"> Activity: Securing the System Bingo o Activity to check student's knowledge on securing systems based on instruction to this
<ul style="list-style-type: none"> Define vulnerabilities 			

point and prior knowledge. Follow the Bingo directions sheet.
 📄 Lab: Applying System Hardening in a Cyber Competition

o This activity will provide reinforcement of hardening concepts
 o Students will work in pairs to resolve all the vulnerabilities on the Cyber Patriot Demo

with a 100% score report

3 Days 2 Days 2 Days

IOS and Threat Modeling	<ul style="list-style-type: none"> 📄 Understand Threat Modeling to determine what risk you are willing to take and what effort you are willing to put in to secure IOT devices 	<ul style="list-style-type: none"> 📄 Activity: IOT Device Threat Models – Students apply Threat Modeling questions to a personal IOT device 📄 Activity: IOT Spoons Game – using the Spoons Game format, 	2 Days
-------------------------	---	---	--------

Midland Park Public Schools

📄 Examine vulnerabilities of home Internet of Things (IOT) – RING, NEST, thermostats, Alexa/Echo.

match an IOT device card with its corresponding cards for usefulness and two possible hacks.

students are challenges to

Teacher Notes: This curriculum all comes from the Garden State Cybersecurity Curriculum. Make sure to check links for anything that would need to be white listed before lessons.

Additional Resources:

Differentiation/Modification Strategies

Students with Disabilities Learners English Language

Gifted and Talented

Students Students at Risk

504Students

<ul style="list-style-type: none"> • Allow errors • Rephrase questions, directions, and explanations • Allow extended time to answer questions and permit drawing as an explanation • Accept participation on any level, even one word • Consult with Case Managers and follow IEP 	<ul style="list-style-type: none"> • Assign a buddy, same language or English speaking • Allow errors in speaking • Rephrase questions, directions, and explanations • Allow extended time to answer questions • Accept participation at any level, even one word 	<ul style="list-style-type: none"> • Provide extension activities • Build on students' intrinsic motivation • Consult with parents to accommodate students' interests in completing tasks at their level of engagement 	<ul style="list-style-type: none"> • Provide extended time to complete tasks • Consult with Guidance Counselors and follow I&RS procedures/action plans • Consult with other members of the 7th grade team for specific behavior interventions • Provide rewards as necessary 	<ul style="list-style-type: none"> • Allow errors • Rephrase questions, directions, and explanations • Allow extended time to answer questions and permit drawing as an explanation • Accept participation on any level, even one word • Consult with Case Managers and follow IEP
---	--	---	---	---

accommodations/ modifications				accommodations/ modifications • Assign a buddy, same language or English speaking
----------------------------------	--	--	--	---

Midland Park Public Schools

Unit 4 - Overview

[Redacted]

Unit 4 - Standards

[Redacted]

8.1.12.NI.3 Explain how the needs of users and the sensitivity of data determine the level of security implemented

8.1.12.CS.1 Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.

[Redacted]

9.2.12.CAP.2 Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.

9.2.12.CAP.8 Determine job entrance criteria (e.g., education credentials, math/writing/reading comprehension tests, and drug tests) used by employers in various industry sectors.

9.4.12.CT.1 Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).

9.4.12.CT.2 Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).

9.4.12.DC.3 Evaluate the social and economic implications of privacy in the context of safety, law, or ethics (e.g., 6.3.12.HistoryCA.1).

9.4.12.DC.4 Explain the privacy concerns related to the collection of data (e.g., cookies) and generation of data through automated processes that may not be evident to users (e.g., 8.1.12.NI.3)

9.4.12.DC.8 Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection.

9.4.12.IML.9 Analyze the decisions creators make to reveal explicit and implicit messages within information and media (e.g., 1.5.12acc.C2a, 7.1.IL.IPRET.4).

9.4.12.TL.1 Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).

[Redacted]

LGBTQ and Disabilities NJSA 18A:35- 4.35
Amistad Law NJSA 18A:35- 4.43
Holocaust Law NJSA 18A:35- 28

AAPI Law
NJSA 18A:25- 4.44
Explore LGBTQ owned cyber security companies, including

but not limited to Social Driver, PBJ Marketing and Concentric Design.
 Students will learn about how bias plays a part in cyber security and what can be done about it.

Explore Jewish owned cyber security companies, including but not limited to SentinelOne, Check Point Software Technologies, and Touch.io

Explore African-American owned cyber security companies, including but not limited to AGB Investigative Services, Lumu, and Silver Shield Security

Explore Asian-American and Pacific Islander owned cyber security companies, including but not limited to Antiy Labs, CYFIRMA, i-Sprint and ThreatBook



Math – MP7	Look for and make use of structure.
------------	-------------------------------------

Science HS ETS1-1
 Science
 HS-ETS1-3

account for societal need and wants.
 Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Science
 HS-ETS1-4 History
 6.1.12.SE.14.a
 Midland Park Public Schools

Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. Explore the various ways women, racial and ethnic minorities, the LGBTQ community, and individuals with disabilities have contributed to the American economy, politics and society

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that



- NJSLSA.SL1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
- NJSLSA.SL2 Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address a question or solve a problem.
- RST.11-12.9 Synthesize information from a range of sources (e.g. texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.



Self-Awareness Examining prejudices and biases
 Having a growth mindset

Self
 Management Social
 Awareness Relationship Skills

organizations/systems on behavior
 Communicating effectively
 Practicing teamwork and collaborative problem-solving
 Showing leadership in groups
 Demonstrating curiosity and open-mindedness
 Recognizing how critical thinking skills are useful both inside & outside of school

Responsible Decision Making
 Exhibiting self-discipline and self-motivation
 Using planning and organizational skills
 Taking others' perspectives
 Understanding the influences of

Unit Essential Question(s):
 What is binary and hexadecimal number systems? What is cryptography?
 What are basic cryptography skills?
 Unit Enduring Understandings:
 Students will understand binary and hexadecimal

number systems and how they are used in coding
 Students will learn what cryptography is and how it is used with encryption
 Students will understand steganography, hashing, scripting, and symmetric encryption

Evidence of Learning

Formative Assessments:

- Do Now
- Teacher observations
- Questioning
- Quizzes
- Practice Programs
- Entry tickets
- Exit tickets
- Online games
- Discussions
- Homework

Summative/Benchmark Assessment(s):

- Projects
- Tests
- Chapter Review / Quizzes
- Chapter Assignments
- Labs

Midland Park Public Schools

- Final Project

Alternative Assessments:

- Portfolio
- Projects
- Online tests / assignments

Resources/Materials:

Garden State Cyber Security Curriculum

Key Vocabulary:

Transistors, Moore's Law, Bit, Byte, Binary Number System, Machine language, Computer language, Compiler, ASCII, Decimal, Hexadecimal, Encoding, Hashing, Obfuscation, Exfiltration, Cryptography, Algorithm (aka Cipher), Plaintext, Ciphertext, Cryptanalysis, Substitution, Monoalphabetic ciphers, Transposition, Shift cipher, Key, Frequency

Bits, Bytes and Binary

Understand that computer language is based on electrical signals called binary code.

Apply binary math to explore how electrical

bits are translated into human language.

Activity: Binary Numbers Magic Trick- Demonstrate the trick to the whole class, see if anyone figures it out on their own. Then divide into 4 groups, take 1

person from each group and teach them the trick. They each get a pack of Binary Numbers cards, return to their group and do the trick until the group members figure it out

Worksheet:

analysis, Polyalphabetic cipher, OTP = One-Time Pad, Steganography, Binwalk, Paths – Absolute, Paths – Relative, Sudo, Shell, Script, Confidentiality, Encryption, Integrity, Non-Repudiation, Hashing, Symmetric Key Encryption

Suggested Pacing Guide

Lesson

Name/Topic

Student Learning Objective(s) Suggested Tasks/Activities: Day(s) to Complete

Converting Binary Numbers to Decimal Numbers

Online

Binary game

<http://games.penjee.com/binary>

numbers-game/

3 Days

make up the hexadecimal number system (base16).

📖 Explore the uses for hexadecimal numbers in computing.

📖 Activity - Students use the ASCII chart to spell their name in hexadecimal digits.

1 Day

Hex 📖 Recognize the digits that

Encoding	<p>📖 Define Encoding and the uses in computing</p> <p>📖 Establish the difference between encoding and encryption</p>	<p>📖 Lab: Decoding with CTF Challenges – A Capture the Flag is a type of cybersecurity competition. Puzzles cover topics like Python, Cryptography, Linux, Binary and Networks.</p> <p>📖 Extension Lesson – The parachute for the Mars Rover</p>	2 Days
----------	--	--	--------

Midland Park Public Schools

landing had a secret message encoded into the fabric using binary. Students will learn about this and then encode their own message into a parachute.

Cryptography Basic Concepts

breaking 3 ciphers - Caesar, text-based Steganography and Column Transposition. PicoCTF and CyberStart America competitions.
 📖 Activity: Terminus Lab Part 2 – To continue the game from where they left off (In Unit 1), students must be careful to follow the instructions at the beginning of Part 2 3 Days

📖 Lab: Vigenere Try It – This activity can be done as a paper or virtual exercise. However, the students achieve better understanding of the Vigenere method by using the paper version as it requires them to walk through the steps. Some students may benefit from trying the virtual option first and then applying it on paper. It is a good practice in understanding how to encrypt AND decrypt with Vigenere.
 📖 Lab: Scavenger Hunt - Students will be asked to solve a mystery by decrypting a series of clues located throughout the school. 3 Days 3 Days

📖 Lab: Steganography CTF Most Capture the Flag competitions will include challenges that include steganography or hiding flags in files. Students will apply five steganography tools to solve challenges from previous

Steganography

- 📖 Define steganography as an alternative method of encryption that does not rely on a key
- 📖 Examine and apply steganography methods to hide or extract information.

Advanced Linux Command Line Interface

- 📖 Examine cryptography vocabulary terms and methods of encryption
- 📖 Identify cryptographic algorithms and define how they can be used to help improve security

- 📖 Review the basic CLI commands for file access and manipulation for Linux (covered in Unit 1.3)
- 📖 Apply advanced Linux CLI commands
- 📖 Lab: Breaking Ciphers - students work in small groups to try

Scripting	<ul style="list-style-type: none"> 📖 Define CLI commands useful for investigation 📖 Define concepts of shells and scripting 📖 Apply knowledge of CLI commands to write basic scripts 📖 Analyze the cybersecurity impact of scripts 	<ul style="list-style-type: none"> 📖 Lab: Scripting in Linux – this will provide practical application of terminal commands AND will demonstrate for students how scripts can be working in the background of any program without their knowledge. 	2 Days
-----------	--	---	--------

Privacy vs Security Debate
 ■ Evaluate student mastery of concepts covered in

Cryptography Unit
 ■ Use news resources to analyze controversies, select and evaluate evidence, construct and refute arguments
 ■ Project: Privacy vs Security Debate - students will read and evaluate news

information about the 2016 dispute between Apple and the FBI concerning access to evidence on an iPhone.
 4 Days

Teacher Notes: This curriculum all comes from the Garden State Cybersecurity Curriculum. Make sure to check links for anything that would need to be white listed before lessons.

Additional Resources:

Differentiation/Modification Strategies

Students with Disabilities Learners Gifted and Talented Students at Risk 504 Students

<ul style="list-style-type: none"> • Allow errors • Rephrase questions, directions, and explanations • Allow extended time to answer questions and permit drawing as an explanation • Accept participation on any level, even one word • Consult with Case Managers and follow IEP accommodations/modifications 	<ul style="list-style-type: none"> • Assign a buddy, same language or English speaking • Allow errors in speaking • Rephrase questions, directions, and explanations • Allow extended time to answer questions • Accept participation at any level, even one word 	<ul style="list-style-type: none"> • Provide extension activities • Build on students' intrinsic motivation • Consult with parents to accommodate students' interests in completing tasks at their level of engagement 	<ul style="list-style-type: none"> • Provide extended time to complete tasks • Consult with Guidance Counselors and follow I&RS procedures/action plans • Consult with other members of the 7th grade team for specific behavior interventions • Provide rewards as necessary 	<ul style="list-style-type: none"> • Allow errors • Rephrase questions, directions, and explanations • Allow extended time to answer questions and permit drawing as an explanation • Accept participation on any level, even one word • Consult with Case Managers and follow IEP accommodations/modifications • Assign a buddy, same language or English speaking
--	--	---	---	---



Unit 5 - Standards

8.1.12.CS.1 Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.

8.1.12.NI.1

Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.

8.1.12.NI.4 Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.

9.2.12.CAP.2 Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.

9.2.12.CAP.8 Determine job entrance criteria (e.g., education credentials, math/writing/reading comprehension tests, and drug tests) used by employers in various industry sectors.

9.4.12.CT.1 Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).

9.4.12.CT.2 Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).

9.4.12.DC.3 Evaluate the social and economic implications of privacy in the context of safety, law, or ethics (e.g., 6.3.12.HistoryCA.1).

9.4.12.DC.4 Explain the privacy concerns related to the collection of data (e.g., cookies) and generation of data through automated processes that may not be evident to users (e.g., 8.1.12.NI.3)

9.4.12.DC.8 Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection.

9.4.12.IML.9 Analyze the decisions creators make to reveal explicit and implicit messages within information and media (e.g., 1.5.12acc.C2a, 7.1.IL.IPRET.4).

9.4.12.TL.1 Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).

LGBTQ and Disabilities NJSA 18A:35- 4.35

Amistad Law NJSA 18A:35- 4.43

Holocaust Law NJSA 18A:35- 28

AAPI Law

NJSA 18A:25- 4.44

Explore LGBTQ owned cyber security companies, including but not limited to Social Driver, PBJ Marketing and Concentric Design.

Students will learn about how bias plays a part in cyber security and what can be done about it.

including but not limited to AGB Investigative Services, Lumu, and Silver Shield Security

Explore Jewish owned cyber security companies, including but not limited to SentinelOne, Check Point Software Technologies, and Touch.io

Explore Asian-American and Pacific Islander owned cyber security companies, including but not limited to Antiy Labs, CYFIRMA, i-Sprint and ThreatBook

Explore African-American owned cyber security companies,

Math - MP1

Make sense of problems and persevere in solving them

[Redacted]
[Redacted]

Science HS ETS1-1
Science
HS-ETS1-3

on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Science
HS-ETS1-4 History
6.1.12.SE.14.a

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal need and wants.

Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. Explore the various ways women, racial and ethnic minorities, the LGBTQ community, and individuals with disabilities have contributed to the American economy, politics and society

Evaluate a solution to a complex real-world problem based

[Redacted]

NJSLSA.SL1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

NJSLSA.SL2 Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address a question or solve a problem.

RST.11-12.9 Synthesize information from a range of sources (e.g. texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

[Redacted]

Self-Awareness ■ Examining prejudices and biases
■ Having a growth mindset

Self
Management Social
Awareness Relationship Skills

organizations/systems on behavior ■
Communicating effectively
■ Practicing teamwork and collaborative problem-solving

Responsible Decision
Making
■ Exhibiting self-discipline and self-motivation
■ Using planning and organizational skills
■ Taking others' perspectives
■ Understanding the influences of

■ Showing leadership in groups
■ Demonstrating curiosity and open-mindedness
■ Recognizing how critical thinking skills are useful both inside & outside of school

Unit Essential Question(s):

- What are the components of a computer and how do they work together?
- What is a network and how does it work?

Unit Enduring Understandings:

- What are the components of a computer and how do they work together?
- What is a network and how does it work?

Evidence of Learning

Formative Assessments:

- Do Now
- Teacher observations
- Questioning
- Quizzes
- Practice Programs
- Entry tickets
- Exit tickets
- Online games
- Discussions
- Homework

Summative/Benchmark Assessment(s):

- Projects
- Tests
- Chapter Review / Quizzes
- Chapter Assignments
- Labs

Midland Park Public Schools

- Final Project

Alternative Assessments:

- Portfolio
- Projects
- Online tests / assignments

Resources/Materials:

Garden State Cyber Security Curriculum

Key Vocabulary:

Processor (aka Central Processing Unit or CPU),
 Memory, Motherboard, Hard Drive, Graphics card,
 Network Interface Card, Input, Storage, Output, RAM =
 Random Access Memory, Machine
 Code, Compiler, Computer Language, POST,
 Firmware, Bootkit, Hosts, Media, Network Devices,
 Peripherals,
 Services, Interfaces, MAC address, IP Address,
 Address Resolution Protocol (ARP), Local Area
 Network (LAN), Wide Area Network (WAN), Hub,

Switch, Wireless Access Point, Reserved Addresses,
 Subnet Mask, DHCP, Network Address Translation,
 Networks, Protocol, Reliability,
 Network Packet Analyzer / Packet sniffer, Packet List,
 Packet Details, Packet Bytes, Pcap, Follow TCP
 Stream, Network Address Translation, Port Address
 Translation, Domain Name System, ifconfig, ping, ssh,
 netcat

Suggested Pacing Guide

Lesson

Name/Topic

Student Learning Objective(s) Suggested
 Tasks/Activities: Day(s) to Complete

Computer Components prior knowledge of PC components.

- 📖 Identify the 4 basic functions of a computer, Input, Storage, Processing and Output
- 📖 Understand how 3 key component process data – Motherboard, CPU and Memory

📖 Examine instances of the attacks on the key PC components difference between GPU and CPU


📖 Lab: Installing PC Components – on the Win7 VM, students use the Virtual Desktop program to apply the proper steps to install computer components.


📖 Activity: Network puzzles -



📖 Extension: What is


Network




- 📖 Identify student's



Connections  Define difference between LAN and WAN students complete the puzzles on their own and then review as a class using projector to show puzzle image.


 Identify characteristics of central connection devices


Network Naming  Explore the Wireshark tool used to capture and analyze network packets  Lab: ARP with Wireshark - learn how to use the Wireshark application for packet capture and network traffic analysis 3 Days


 Define how naming and identifiers are used in networking

<p>Communicating in a Network (Mobster Net)</p>	<ul style="list-style-type: none">  Understand analog method of message delivery as a single communication  Devise a delivery method for messages that are broken up into packets 	<ul style="list-style-type: none">  Activity: Mobster Net - The goal is that student groups will come up with a plan for reliable delivery of messages – i.e. "invent" TCP protocol based delivery of packets 	<p>2 Days</p>
---	---	---	---------------


Packet Delivery and Protocols  Establish difference between circuit switching and packet switching  Define protocols and TCP/IP suite


 Explain how protocols use ports / well-known port numbers

 Compare and contrast TCP and UDP transport protocols

 Examine how TCP

Midland Park Public Schools uses the 3-way handshake

 Perform network traffic analysis using the Wireshark Tool

 Lab: Wireshark Packet Analysis – Students will work on the Ubuntu VM to follow along as you present on the screen. They will learn how to use the Wireshark application for network traffic analysis 3 Days

troubleshoot and configure systems.

Pitch

- Social Engineering PSA Video
 - Using Benchmark Selections for OS Configuration
 - Making an Impact with Technology
 - Ethics
- 1 Day

End Projects ■ Projects that students can complete at the end of the course

■ Lab: CLI in Networking – using the course Ubuntu and Metasploitable VMs, students will practice using four terminal commands: ping, ifconfig, ssh and netcat.

Distribute worksheet for this lab.

■ Which Authentication Sales 2 Weeks

Network CLI ■ Review the basic CLI commands previously learned for both DOS and Linux

■ Apply network utility commands to

Teacher Notes: This curriculum all comes from the Garden State Cybersecurity Curriculum. Make sure to check links for anything that would need to be white listed before lessons.

Additional Resources:

Differentiation/Modification Strategies

Students with Disabilities
English Language Learners

Learners Gifted and Talented

Students at Risk

504 Students

<ul style="list-style-type: none"> • Allow errors • Rephrase questions, directions, and explanations • Allow extended time to answer questions and permit drawing as an explanation • Accept participation on any level, even one word • Consult with Case Managers and follow 	<ul style="list-style-type: none"> • Assign a buddy, same language or English speaking • Allow errors in speaking • Rephrase questions, directions, and explanations • Allow extended time to answer questions • Accept participation at any level, even one word 	<ul style="list-style-type: none"> • Provide extension activities • Build on students' intrinsic motivation • Consult with parents to accommodate students' interests in completing tasks at their level of engagement 	<ul style="list-style-type: none"> • Provide extended time to complete tasks • Consult with Guidance Counselors and follow I&RS procedures/action plans • Consult with other members of the 7th grade team for specific behavior interventions • Provide rewards as necessary 	<ul style="list-style-type: none"> • Allow errors • Rephrase questions, directions, and explanations • Allow extended time to answer questions and permit drawing as an explanation • Accept participation on any level, even one word • Consult with Case Managers and follow
---	--	---	---	---

Midland Park Public Schools

IEP accommodations/ modifications				IEP accommodations/ modifications • Assign a buddy, same language or English speaking
--------------------------------------	--	--	--	---