



Township of Ocean Schools

Assistant Superintendent
Office of Teaching and Learning

SPARTAN MISSION:

Meeting the needs of all students with a proud tradition of academic excellence.

DEPARTMENT Mathematics COURSE Introduction to Computer Networking

Curriculum Development Timeline

School: Ocean Township High School

Course: Intro to Computer Networking

Department: Mathematics

Board Approval	Supervisor	Notes
August 2013	Janet Bluefield	Born Date
August 2019	Nichole Kerney	Review
August 2022	Gerard Marrone	Alignment to Standards

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DEPARTMENT Mathematics COURSE Introduction to Computer Networking

Township of Ocean Pacing Guide			
Week	Marking Period 1	Week	Marking Period 3
1	Introduction to Networks	11	Routing
2	Introduction to Networks	12	Network Security
3	Network Hardware and Software	13	Network Security
4	Network Hardware and Software	14	Advanced Networking
5	Cabling and Topology	15	Advanced Networking
Week	Marking Period 2	Week	Marking Period 4
6	Cabling and Topology	16	Wireless Networking
7	Modern and Basic Ethernet Theory	17	Wireless Networking
8	TCP/IP and Installing the Physical Network	18	Network Management
9	TCP/IP and Installing the Physical Network	19	Home/Office Network Design Practical
10	Routing	20	N+ Certification Practice

Core Instructional & Supplemental Materials including various levels of Texts

CompTIA N+ Certification All-in-One Exam Guide, Ninth Edition (Exams 220-901 & 220-902) by Mike Myers
 CompTIA official site <https://certification.comptia.org/>
 Professor Messer full video training course for N+ certification
<https://www.youtube.com/user/professormesser>
 Code.org
 Youtube.com

Time Frame	2 Weeks (10 blocks)
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Topic
Introduction to Networks
Alignment to Standards
9.4.12.CI.2: Identify career pathways that highlight personal talents, skills and abilities. 9.4.12.TL.1: Assess digital tools based on features such as accessibility options, capacities and utility for accomplishing a specific task 9.2.12.CAP.5: Assess and modify a personal plan to support current interests and postsecondary plans. 9.4.12.CT.3: Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why solutions may work better than others (e.g., political, economic, cultural). 9.4.12.CT.1: Identify problem-solving strategies used in the development of an innovative product or practice.
Learning Objectives and Activities
SWBAT answer the following questions: • What is a network technician and how do I become one? • What is the general history of networking? • What is the OSI Model and how does it help me model and understand basic networking? SWBAT demonstrate understanding of the following: • The definition of a proper Network Technician and how a person becomes one. • The history of networking computers from the early 1970's until present day. • An in-depth explanation of the OSI Seven Layer Model and how it works in action. Learning Activities: • The students will do research and engage in an online discussion on the different jobs and positions available to the computer literate. • Through research and discussion students will understand the definition of a Network Administrator and what it is to be a professional Network Administrator in society. • After a visual inspection of the hardware we will be using in networking, the students will discover the appropriate physical tools and an understanding of the different tool kits needed to perform the various tasks ahead.(hands-on activity) • A narrated pictorial on the background on how far society has come in Networking. • A general understanding of the layering system of information and how transportation occurs between these various layers. This is done through physical example followed by theory. • Comprehensive benchmark survey to assess skill set and determines aptitude and

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potential group placement.

- A research activity to identify the oldest piece of networking technology.
- General exercise on safety setup with electric devices to gauge power constraints of the lab.
- An interactive exploration of the OSI layer system as we build a theoretical network cake

Assessments

Formative:

- Research and Debate
- Matching Game with networking hardware & tools
- Visual observation
- Line up in order of oldest tech game

Summative:

- Quiz on tools and their uses in networking
- Test on the basics of the OSI Model

Alternative:

- Draw the OSI cake

Interdisciplinary Connections

Career Readiness, Life Literacies, and Key Skills

9.3.ST.4: Understand the nature and scope of the Science, Technology, Engineering & Mathematics Career Cluster and the role of STEM in society and the economy.

Technology Integration

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

- 9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.

Additional resources and extension activities will be posted on Google Classroom in order to encourage students to reflect on their learning and expand on their knowledge.

- 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Students will use Google Classroom to collaborate, work towards solving authentic

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problems, or participate in an online classroom discussion utilizing pre-learned etiquette about blended learning platforms.

- 9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem.

Career Education

CRP2: Apply appropriate academic and technical skills.

CRP4: Communicate clearly and effectively with reason.

CRP10: Plan education and career paths aligned to personal goals.

Time Frame	2 Weeks (10 blocks)
Topic	
Network Hardware and Software	
Alignment to Standards	
9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem. 9.4.12.CT.3: Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why solutions may work better than others (e.g., political, economic, cultural). 9.4.12.CT.1: Identify problem-solving strategies used in the development of an innovative product or practice. 8.2.12.ED.4: Design a product or system that addresses a global problem and document decisions made based on research, constraints, trade-offs, and aesthetic and ethical considerations and share this information with an appropriate audience. 8.2.12.NT.1: Explain how different groups can contribute to the overall design of a product.	
Learning Objectives and Activities	
SWBAT answer the following questions: • How and where do reality and theory intersect in Network Theory? • What is a modern network? • What software and hardware are necessary in modern networking? • Are there essential hardware, software and 3rd party requirements to setting up a network? SWBAT demonstrate understanding of the following:	

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- A look at how the 7 layer OSI model is represented in reality.
- A basic understanding of the requirements that need to be present to network two devices together.
- A comprehensive definition of a modern network and the tools to draw and define a technical sketch of that model.

Learning Activities:

- A discovery opening do-now will illustrate how a network is a way to connect and share information between computers.
- By observation the student will catalog/list/shop for basic requirements needed in hardware and software operating systems to achieve a connection between two computers and describe it to others.
- Through online research the students will look at service providers and what requirements must be met to fill specific networking needs.
- Hands-on look at the system software and how we configure it to network with other computers.
- Lecture and discussion to define communication and drawing parameters in order to communicate.
- Examples and exercises will show a mathematical look at network theory and how we apply it to the modern computer network.
- An individual exercise on drawing a home network sketch to online drawing.
- A group exercise on basic debugging techniques to troubleshoot minor issues with networking setups.

Assessments

Formative:

- Catalog/Shop Project progress
- Visual Inspection of online research
- Network Drawing progress

Summative:

- Completed catalog/Shop Report
- Results of Service Provider online research evaluated
- Completed home network drawing

Alternative:

- Advanced users can design more elaborate network diagrams

Interdisciplinary Connections

CS&DT: 8.2.12.ED.3: Evaluate several models of the same type of product and make recommendations for a new design based on a cost benefit analysis.

Career Readiness, Life Literacies, and Key Skills

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Technology Integration

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- 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Students will use Google Classroom to collaborate, work towards solving authentic problems, or participate in an online classroom discussion utilizing pre-learned etiquette about blended learning platforms.

- 9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem.

Career Education

CRP2: Apply appropriate academic and technical skills.

CRP7: Employ valid and reliable research strategies.





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Time Frame	2 Weeks (10 blocks)
Topic	
Cabling & Topology	
Alignment to Standards	
9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem. 8.1.12.AP.9: Collaboratively document and present design decisions in the development of complex programs. 8.1.12.AP.6: Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs. 8.2.12.NT.2: Redesign an existing product to improve form or function. 8.2.12.ETW.4: Research historical tensions between environmental and economic considerations as driven by human needs and wants in the development of a technological product and present the competing viewpoints. 8.2.12.ED.5: Evaluate the effectiveness of a product or system based on factors that are related to its requirements, specifications, and constraints (e.g., safety, reliability, economic considerations, quality control, environmental concerns, manufacturability, maintenance and repair, ergonomics).	
Learning Objectives and Activities	
SWBAT answer the following questions: • What are the different wires/cables needed to network computers? • How do I identify the various connector ends of each cable and their pc component jack? • How do I create cables of my own? • What are the specifications and constraints of the different wire types and connector ends? • What is topology and how does it apply to networking theory? • How does my home network drawing fit into the theory of topology? SWBAT demonstrate understanding of the following: • The ability to research parameters, identify and build all cables needed in modern networking. • The knowledge and core concepts of network design & construction in respect to facility management, design, and layout. Learning Activities:	

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- Through examination students will dissect a few prebuilt network topologies to understand that ethernet cable is our modern network life line.
- Each student through hands-on experience will be able to identify, test and build all the different cables that go into networking computers.
- The students will expand on the skill set acquired in the previous unit to draw a full network diagram for a larger than home scenario or small business location.
- Hands on look at all of the wires ,beyond the scope of the course, that go into networking.
- Hands-on learn and grow activity building, testing and analyzing different Ethernet cables to check labeled specifications.
- Visual overview of all other connectors/cables and how to identify their power connection and proper placement.
- A research project on medium business/office networks, where the student will design their own.

Assessments

Formative:

- 5 min Q&A on problems, clarifications, and expectations
- Wire matching quiz
- Wire specification quiz
- Topology identification quiz
- Visual observation of project progress
- Exit reminder of deadlines and progress thoughts

Summative:

- Properly tested student created ethernet cable
- Small Network Layout Diagram
- Medium Network Layout Diagram

Interdisciplinary Connections

Career Readiness, Life Literacies, and Key Skills

Technology Integration

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

- 9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives

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on a real-world problem.

Additional resources and extension activities will be posted on Google Classroom in order to encourage students to reflect on their learning and expand on their knowledge.

- 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Students will use Google Classroom to collaborate, work towards solving authentic problems, or participate in an online classroom discussion utilizing pre-learned etiquette about blended learning platforms.

- 9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem.

Career Education

CRP6: Demonstrate creativity and innovation.

CRP8: Utilize critical thinking to make sense of problems and persevere in solving them

Time Frame	1 Week (5 blocks)
Topic	
Modern and Basic Ethernet Theory	
Alignment to Standards	
8.1.12.AP.9: Collaboratively document and present design decisions in the development of complex programs. 8.1.12.AP.6: Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs. 8.2.12.ETW.1: Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product. 8.1.12.CS.3: Compare the functions of application software, system software, and hardware.	
Learning Objectives and Activities	
SWBAT answer the following questions: • What is and why Ethernet? • How do I identify data under 10 baseT? • What are the constraints (length and bandwidth) of Ethernet?	

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- How many different types of Ethernet are there?

SWBAT demonstrate understanding of the following:

- Ethernet cables come in various data sizes.
- Each size has a specific bandwidth and length it can be run for effective data transfer.
- The data transferred is sent with a certain packet size and frequency.

Learning Activities:

- Through visual aids and lecture the students will realize that ethernet is our modern superhighway with very few restrictions.
- The learner will use a role play scenario to be able to assess his networking needs and select the proper cable for filling those needs in a pre chosen situation.
- Lecture and discussion on an overview of the history of networking cables to have the students build a speed chart.
- Students will use ookla.com to test bandwidth in various practical situations for a compare contrast chart.
- An individual exercise where each student selects a cable and creates a cartoon to describe its bandwidth.
- Hands on activity to demonstrate the speed/limitations of different Ethernet cables.
- Lecture and discussion to nail down the finer points of data transfer (ttl, packet size, and buffer)

Assessments

Formative:

- Daily game of "Can it work?"
- Quiz on cable speeds and length calculations
- Homework on testing different bandwidths

Summative:

- Role play solutions
- Bandwidth comparison chart
- Cartoon

Alternative:

- Advanced students can work with punch down cables and alternate ethernet connector ends.

Interdisciplinary Connections

Career Readiness, Life Literacies, and Key Skills

9.3.ST-ET.1: Use STEM concepts and processes to solve problems involving design

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and/or production.

9.3.ST-ET.2: Display and communicate STEM information

Technology Integration

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- 9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.

Additional resources and extension activities will be posted on Google Classroom in order to encourage students to reflect on their learning and expand on their knowledge.

- 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Students will use Google Classroom to collaborate, work towards solving authentic problems, or participate in an online classroom discussion utilizing pre-learned etiquette about blended learning platforms.

- 9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem.

Career Education

CRP2: Apply appropriate academic and technical skills.

CRP4: Communicate clearly and effectively with reason.

Time Frame	2 Weeks (10 blocks)
Topic	
TCP/IP and Installing the Physical Network	
Alignment to Standards	
8.1.12.AP.9: Collaboratively document and present design decisions in the development of complex programs.	
8.1.12.AP.6: Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.	

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Learning Objectives and Activities

SWBAT answer the following questions:

- What is TCP/IP?
- How do I set up a conceptual network?
- What is an IP address and why is it necessary?
- Where on my computer do I find the Physical Network settings?
- Could the modern internet exist without TCP/IP?

SWBAT demonstrate understanding of the following:

- TCP/IP is a networking protocol that computers must subscribe to in order to connect with each other.
- An IP address is a number that is used for identifying your network locations.
- The location of the setting for changing network parameters on OSX, Windows OS, and Linux.

Learning Activities:

- Through an interactive class wide drawn lesson the students will gain the ability to read an ipv4 address and know its full implications.
- Hands-on activity on how to network multiple computers manually using their system settings not dhcp.
- Though a discovery lesson the students will obtain the skill set and tools to test the system for statistics on the Physical Network.
- Lecture, define and discuss TCP/IP, DNS, DHCP and IP Addressing system.
- Guided example of a basic network and its addressing system under TCP/IP.
- Hands-on exploration of the three operating systems and how they set up their network information

Assessments

Formative:

- Ipv4 address system quiz
- Discovery lesson observation

Summative:

- Test on OSI and TCP/IP Models and all network theory up to this point.

Alternative:

- Web based ipv4 matching tetris game
- Advance ipv6 videos

Interdisciplinary Connections

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Career Readiness, Life Literacies, and Key Skills

Technology Integration

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- 9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem.

Career Education

CRP2: Apply appropriate academic and technical skills.

Time Frame	2 Weeks (10 blocks)
Topic	
Routing	
Alignment to Standards	
9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem. 9.4.12.CT.3: Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why solutions may work better than others (e.g., political, economic, cultural). 9.4.12.CT.1: Identify problem-solving strategies used in the development of an innovative	

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product or practice.

Learning Objectives and Activities

SWBAT answer the following questions:

- What is a router and how does it work?
- What is the difference between static and dynamic routing?
- How do we set up a router/bridge?
- How do we set up a proper home routing system?

SWBAT demonstrate understanding of the following:

- A router is a device that connects computers to form a modern network.
- A router uses the IP Addressing system to connect computers together enabling them to share data and resources.
- The difference between Static (fixed) and Dynamic (logically assigned) IP Addressing.
- Proper design and implementation of a real home network.

Learning Activities:

- Though hands-on set up the students will gain the ability to set up a personal computer so it can share information and see other shared information.
- Through a daily opener students will be able to identify the necessary components and set up to achieve networking.
- A review lecture will reinforce the idea of what ip addresses are and when to use them in a fixed or assigned manner.
- Though hands-on set up the students will gain the ability to select, configure, and install a router between at least two computer systems
- Lecture and discussion to define routers.
- Research project on various routers/service providers to compare and contrast.
- Hands-on group activity to set up a basic hardwired network and connection to the internet.
- Hands-on activity to choose and install/configure a router between two computers.

Assessments

Formative:

- Daily opener to troubleshoot set up mistakes
- Visual assessment on discovery projects
- "How Many computers do I need?" exit questions

Summative:

- Group hardwired internet ready static and dynamic network project
- Group hardwired static connection between two computers

Alternative:

- Reflection paper on how network play a role in your life

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- Youtube video collection on topic
- Research/discussion on fringe areas of this topic

Interdisciplinary Connections

Career Readiness, Life Literacies, and Key Skills

9.3.IT.12: Demonstrate knowledge of the hardware components associated with information systems.

Technology Integration

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- 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

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- 9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem.

Career Education

CRP4: Communicate clearly and effectively with reason.

CRP12: Work productively in teams while using cultural global competence.

Time Frame	2 Weeks (10 blocks)
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Topic

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Network Security

Alignment to Standards

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

9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving.

9.4.12.CT.3: Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why solutions may work better than others (e.g., political, economic, cultural).

Learning Objectives and Activities

SWBAT answer the following questions:

- How do we secure a modern network?
- What is encryption and authentication?
- What are the modern security standards deployed at this time?

SWBAT demonstrate understanding of the following:

- Security protocols/rights/privileges are necessary when networking/sharing between computers.
- A modern network has many different ways to secure/protect itself.
- Passwords creation and network security are very similar.
- The standards that are considered fully protected while networking.
- The proper order of operations for dealing with security breaches.

Learning Activities:

- Fun secret code game will illustrate the concept of encryption and its various uses will be understood on how it applies to network security.
- Hands-on teacher led example exercise will give the students the ability to secure any network on a variety of levels.
- Discovery(trial & error) worksheet will use the internet research to define what security protocol works for the proper situation.
- Lecture and discuss on the history of encryption and how it is important over time. Use this new information to define all the modern security protocols used at this time.
- Encryption research assignment.
- Hands-on activity to set up a secure network.

Assessments

Formative:

- Secret code decryption of the day(escape room style)

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- Visual progress of discovery lesson and projects
- Network protocols quiz

Summative:

- Encryption research assignment
- Group set up of a secure network

Alternative:

- Student hacking session on student networks

Interdisciplinary Connections

ELA: WHST.9-10.1.B: Develop claim(s) and counterclaims using sound reasoning, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns. With regard to the research and reflection.

Career Readiness, Life Literacies, and Key Skills

Technology Integration

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- 9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem.

Career Education

CRP4: Communicate clearly and effectively with reason.

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DEPARTMENT Mathematics COURSE Introduction to Computer Networking

CRP7: Employ valid and reliable research strategies.

Time Frame	2 Weeks (10 blocks)
Topic	
Advanced Networking	
Alignment to Standards	
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Learning Objectives and Activities	
SWBAT answer the following questions: • What is client server? • What is a peer to peer network? • What is VOIP? • What is a VPN and how do I set one up? • Will we ever run out of IP addresses? SWBAT demonstrate understanding of the following: • Client server is a way to describe the ability to house computer resources/information away from the networked local personal computer. • Peer to peer is a network connection between two people. • VPN is a virtual private network and is a secure connection between computers over the public internet. • VOIP is voice over IP and is used for internet phone. • IPV6 is the next generation of IP addressing. Learning Activities: • Hands-on guided activity to set-up and join a peer to peer network. • Fill in the blanks mad lib activity to get an understanding on the underbelly of voip. • Hands-on guided activity to set up and use a vpn on any operating system. • Lecture, discuss all concepts in theory before engaging in hands on portion of activity.	

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DEPARTMENT Mathematics COURSE Introduction to Computer Networking

- Hands-on activity worksheet led activity to set up a peer to peer and vpn network between a computer and a designated remote on multiple operating systems.
- Discussion and guided example to display common problems with p2p and vpn.
- Extra: (advanced) Design a use for a p2p network

Assessments

Formative:

- Dail network Mad Lib word request to complete VOIP understanding
- Visual progress of hands-on activities
- Networking vocabulary quiz

Summative:

- Completed Google Docs questionnaire for hands-on activities
- Completed network requirements

Alternative:

- Design a use for a p2p network
- Famous Technical Advancement Research Paper

Interdisciplinary Connections

Career Readiness, Life Literacies, and Key Skills

Technology Integration

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

- 9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.

Additional resources and extension activities will be posted on Google Classroom in order to encourage students to reflect on their learning and expand on their knowledge.

- 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Students will use Google Classroom to collaborate, work towards solving authentic problems, or participate in an online classroom discussion utilizing pre-learned etiquette about blended learning platforms.

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- 9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem.

Career Education

CRP8: Utilize critical thinking to make sense of problems and persevere in solving them.

Time Frame	2 Weeks (10 blocks)
Topic	
Wireless Networking	
Alignment to Standards	
9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem. 9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving. 9.4.12.CT.3: Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why solutions may work better than others (e.g., political, economic, cultural). 9.4.12.CT.1: Identify problem-solving strategies used in the development of an innovative product or practice.	
Learning Objectives and Activities	
SWBAT answer the following questions: - What is the history behind wireless technology? - What are the Wi-Fi Standards? - Is installing a Wi-Fi network any different from my wired network? - How do I set up a Wi-Fi network and secure it? - What is a MAC address? - Are there any other types of wireless communication? SWBAT demonstrate understanding of the following: - WIFI standards are set up to be a universal standard of communication protocols. - All wireless devices have a machine address to identify on a network. - The different standards describe different wave patterns and data transfer speeds. Securing a wireless network is the same a securing a wired network.	

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- Encryption and security protocols have a data/speed price in wireless security.
- Modern wireless communication can be done via cell, Bluetooth, Wi-Fi, and infrared.

Learning Activities:

- Students will set up various iterations of a basic home/business wireless network.
- A conceptual visual interactive overview of different wireless communication (cell, Wi-Fi, Bluetooth ,ir). Video montage
- Discovery lesson to illustrate many uses of a firewall and the mac address.
- Opening do now to theorize the future of network security and their problems.
- Lecture and discuss the various aspects/theories for home Wi-Fi network/PC security.
- Hands-on activity/demonstration on setting up a Wi-Fi router/network.
- Hands-on activity/demonstration of basic Wi-Fi network security.
- Lecture and discuss about basic Wi-Fi hacking and how to defend a pc/network from it.

Assessments

Formative:

- Daily do-now on the future of network security problems
- MAC Addy Quiz
- Visual inspection of hands-on activities

Summative:

- Wireless networking test

Interdisciplinary Connections

Career Readiness, Life Literacies, and Key Skills

Technology Integration

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- 9.4.8.TL.3: Select appropriate tools to organize and present information

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digitally.

Students will use Google Classroom to collaborate, work towards solving authentic problems, or participate in an online classroom discussion utilizing pre-learned etiquette about blended learning platforms.

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Career Education

CRP8: Utilize critical thinking to make sense of problems and persevere in solving them.

Time Frame	1 Week (5 blocks)
Topic	
Network Management	
Alignment to Standards	
9.4.12.DC.6: Select information to post online that positively impacts personal image and future college and career opportunities.	
Learning Objectives and Activities	
SWBAT answer the following questions: ● What are the expectations of a Network Administrator? ● How do I monitor the activity/performance of my network? ● What are some other theories on network configuration? ● What tools and software/hardware will I need to become a Network Administrator? SWBAT demonstrate understanding of the following: ● An understanding of all that is required of a network administrator. ● An awareness of all the software and hardware tools at the disposal of a network administrator. Learning Activities: ● Role play networking simulations will give students the ability to assess the need of a network and apply the correct software/hardware solution. ● Hands-on guided installation of network computer software/hardware.	

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- Matching software specifications to hardware specifications so it runs properly game.
- Class wide run, individual role play to be a network administrator with live interactions.
- Lecture and discuss all of the possible expectations of a network administrator.
- Guided/Hands-on explanation/installation of monitoring software/hardware.

Assessments

Formative:

- Matching game
- Homework
- Visual inspection of hands-on work
- Exit ticket

Summative:

- PC Administrator mid-sized assessment
- Completed computer installations/configurations

Interdisciplinary Connections

Career Readiness, Life Literacies, and Key Skills

9.3.ST.3: Describe and follow safety, health and environmental standards related to science, technology, engineering and mathematics (STEM) workplaces.

Technology Integration

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- 9.4.12.TL.4: Collaborate in online learning communities or social networks or

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virtual worlds to analyze and propose a resolution to a real-world problem.

Career Education

CRP1: Act as a responsible and contributing citizen and employee.

Time Frame	1 Week (5 blocks)
Topic	
Home/Office Network Design Practical	
Alignment to Standards	
8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device. 8.1.12.CS.2: Model interactions between application software, system software, and hardware. 8.1.12.CS.3: Compare the functions of application software, system software, and hardware.	
Learning Objectives and Activities	
SWBAT answer the following questions: - Can I research, design, set-up, secure, and monitor my own wired/wireless network? SWBAT demonstrate understanding of the following: - The overall understanding of how to research, design, set-up, secure, and monitor a wired/wireless network. Learning Activities: - The student will be able to research, design, set-up, secure, and monitor their own wired/wireless network - Short activity to design a network of their choosing. - Research activity to shop and purchase hardware and software for this network. - Hands-on activity where the learner assembles and sets up their network.	
Assessments	
Formative: - Step-by-step guided check-in Q&A points - Visual progress of project	

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Summative:

- Completed project of Design/build/run/maintain a personal wired/wireless network with clients.

Alternative:

- Presentation project available for struggling students

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Career Education

CRP4: Communicate clearly and effectively with reason.

CRP5: Consider the environmental, social and economic impacts of decisions.

CRP6: Demonstrate creativity and innovation.

Time Frame

1 Week (5 blocks)

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Topic
N+ Certification Practice
Alignment to Standards
9.4.12.CT.3: Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why solutions may work better than others (e.g., political, economic, cultural). 9.4.12.CT.1: Identify problem-solving strategies used in the development of an innovative product or practice.
Learning Objectives and Activities
SWBAT answer the following questions: • What is N+ certification and why is it necessary? • How do I become N+ certified? SWBAT demonstrate understanding of the following: • The understanding of what is it to be network certified. • Knowledge of what is on the N+ certification test. • How a person prepares and signs up for the N+ examination. Learning Activities: • The student will understand the set list of topics that are covered by the N+ certification assessment from online research and web based resources. • Students will take all known sources of data and comprise a study strategy. • Lecture and discuss what the N+ exam is and why it is needed in society. • A review session on the important material that will be assessed by the exam. • Students will play a hands-on game that tests their knowledge of modern technology. • Students will take the N+ practice exam to gauge preparedness for the real thing.
Assessments
<u>Formative:</u> • Daily growing list of N+ sources • Classwork/Daily Activity and Homework • Teacher Observation • 5 minute discussion daily on sticky questions from research/practice <u>Summative:</u> • Written research/study strategy for N+ exam • N+ certification practice test 1 • N+ certification practice test 2

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Benchmark:

- Cumulative Course Benchmark

Alternative:

- Basic course study guide
- Cumulative Course Benchmark

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Career Education

CRP7: Employ valid and reliable research strategies.

CRP10: Plan education and career paths aligned to personal goals.

Modifications (ELL, Special Education, At Risk Students, Gifted & Talented, & 504 Plans)

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ELL:

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher models reading aloud daily
- Provide peer tutoring
- Use of Bilingual Dictionary
- Guided notes and/or scaffold outline for written assignments
- Provide students with English Learner leveled readers.

Supports for Students With IEPs:

- Allow extra time to complete assignments or tests
- Guided notes and/or scaffold outline for written assignments
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications

At-Risk Students:

- Guided notes and/or scaffold outline for written assignments
- Introduce key vocabulary before lesson
- Work in a small group
- Lesson taught again using a differentiated approach
- Allow answers to be given orally or dictated
- Use visuals / Anchor Charts
- Leveled texts according to ability

Gifted and Talented:

- Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles)
- Provide options, alternatives and choices to differentiate and broaden the curriculum
- Organize and offer flexible small group learning activities
- Provide whole group enrichment explorations
- Teach cognitive and methodological skills
- Use center, stations, or contracts
- Organize integrated problem-solving simulations
- Propose interest-based extension activities

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- Expose students to beyond level texts.

Supports for Students With 504 Plans:

- Follow all the 504 plan modifications
- Text to speech/audio recorded selections
- Amplification system as needed
- Leveled texts according to ability
- Fine motor skill stations embedded in rotation as needed
- Modified or constrained spelling word lists
- Provide anchor charts with high frequency words and phonemic patterns

