



# 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.*

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## **Curriculum Development Timeline**

**School:** Ocean Township High School

**Course:** Intro to Computer Networking

**Department:** Mathematics

| <b>Board Approval</b> | <b>Supervisor</b> | <b>Notes</b> |
|-----------------------|-------------------|--------------|
| August 2013           | Janet Bluefield   | Born Date    |
| August 2019           | Nichole Kerney    | Review       |



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| 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            |

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### 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)**

### Topic

Introduction to Networks

### Essential 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?

### Enduring Understandings

- 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.

### Alignment to Standards

8.1.12.A.1: Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.  
8.1.12.E.1: Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.

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### Learning Activities & Key Concepts and Skills

- 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 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

### 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.

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### 21st Century Skills

CTE.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.

### Interdisciplinary Connections

SOC.6.2.12.C.6.d: Determine how the availability of scientific, technological, and medical advances impacts the quality of life in different countries. This is evident through the lecture on the history of networking and its impacts.

### Technology Integration

8.1 Educational Technology- 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.

- 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.
- Students will use Google Classroom to participate in an online classroom discussion utilizing pre-learned etiquette about blended learning platforms.

|  |                            |
|--|----------------------------|
| Time Frame   | <b>2 weeks (10 blocks)</b> |
| <b>Topic</b>   |                            |
| Network Hardware and Software  |                            |
| <b>Essential Questions</b>   |                            |
| <ul style="list-style-type: none"> <li>• How and where do reality and theory intersect in Network Theory?</li> <li>• What is a modern network?</li> <li>• What software and hardware are necessary in modern networking?</li> <li>• Are there essential hardware, software and 3<sup>rd</sup> party requirements to setting up a network?</li> </ul> |                            |
| <b>Enduring Understandings</b>   |                            |

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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.

### Alignment to Standards

8.1.12.A.3: Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.

8.1.12.E.1: Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.

8.2.12.A.2: Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.

8.2.12.C.4: Explain and identify interdependent systems and their functions.

### Learning Activities & Key Concepts and Skills

- 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

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- 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

## Career Education

CRP2: Apply appropriate academic and technical skills.  
CRP7: Employ valid and reliable research strategies.

## 21st Century Skills

## Interdisciplinary Connections

## Technology Integration

8.1 Educational Technology: 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.

- 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.
- Students will use Google Draw to extend learning and apply skills to new content.
- Students will use network routers, switches, ethernet cables, and testing equipment.

Time Frame

**2 weeks (10 blocks)**

Topic

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### Cabling and Topology

#### Essential 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?

#### Enduring Understandings

- 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.

#### Alignment to Standards

8.1.12.A.3: Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.  
8.1.12.B.2: Apply previous content knowledge by creating and piloting a digital learning game or tutorial.  
8.2.12.C.2: Analyze a product and how it has changed or might change over time to meet human needs and wants.  
8.2.2.D.2: Discover how a product works by taking it apart, sketching how parts fit, and putting it back together.

#### Learning Activities & Key Concepts and Skills

- 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

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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

## Career Education

CRP6: Demonstrate creativity and innovation.

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

## 21st Century Skills

## Interdisciplinary Connections

## Technology Integration

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8.1 Educational Technology- 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.

- 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.
- Students will use network crimp & punch set to create ethernet cables, cat5 to 6 cable with and without rigid insulator for medium, polarity testing equipment for verifying cables.
- Students will use Google Draw to extend learning and apply skills to new content.

Time Frame

**1 weeks (5 blocks)**

Topic

Modern and Basic Ethernet Theory

Essential Questions

- What is and why Ethernet?
- How do I identify data under 10 baseT?
- What are the constraints (length and bandwidth) of Ethernet?
- How many different types of Ethernet are there?

Enduring Understandings

- 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.

Alignment to Standards

8.1.12.B.2: Apply previous content knowledge by creating and piloting a digital learning game or tutorial.

8.2.2.B.1: Identify how technology impacts or improves life.

8.2.12.D.3: Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.

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### Learning Activities & Key Concepts and Skills

- 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.

### Career Education

CRP2: Apply appropriate academic and technical skills.  
CRP4: Communicate clearly and effectively with reason.

### 21st Century Skills

CTE.9.3.ST- ET.1: Use STEM concepts and processes to solve problems involving design and/or production.  
CTE.9.3.ST- ET.2: Display and communicate STEM information.

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### Interdisciplinary Connections

### Technology Integration

8.1 Educational Technology- 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.

- 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.
- Students will access ookla.com web based software program to further investigate lesson concepts.

|   |                            |
|---|----------------------------|
| Time Frame  | <b>2 weeks (10 blocks)</b> |
| <b>Topic</b>  |                            |
| TCP/IP and Installing the Physical Network  |                            |
| <b>Essential Questions</b>  |                            |
| <ul style="list-style-type: none"> <li>• What is TCP/IP?</li> <li>• How do I set up a conceptual network?</li> <li>• What is an IP address and why is it necessary?</li> <li>• Where on my computer do I find the Physical Network settings?</li> <li>• Could the modern internet exist without TCP/IP?</li> </ul>  |                            |
| <b>Enduring Understandings</b>  |                            |
| <ul style="list-style-type: none"> <li>• TCP/IP is a networking protocol that computers must subscribe to in order to connect with each other.</li> <li>• An IP address is a number that is used for identifying your network locations.</li> <li>• The location of the setting for changing network parameters on OSX, Windows OS, and Linux.</li> </ul> |                            |






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### Alignment to Standards

8.1.12.B.2: Apply previous content knowledge by creating and piloting a digital learning game or tutorial.

### Learning Activities & Key Concepts and Skills

- 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

### Career Education

CRP2: Apply appropriate academic and technical skills.

### 21st Century Skills

### Interdisciplinary Connections

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### Technology Integration

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- 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.
- Students will be using Windows and Linux operating systems to enhance understanding of this unit.

|            |                            |
|------------|----------------------------|
| Time Frame | <b>2 weeks (10 blocks)</b> |
|------------|----------------------------|

### Topic

### Routing

### Essential 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?

### Enduring Understandings

- 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.

### Alignments to Standards

8.1.12.A.3: Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.

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8.1.12.E.1: Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.

### Learning Activities & Key Concepts and Skills

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

### Career Education

CRP4: Communicate clearly and effectively with reason.

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

### 21st Century Skills

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

### Interdisciplinary Connections

### Technology Integration

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- 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.
- Students will use real routers, cables and computers to piggyback onto the schools network connection to achieve an internet connection of their own.

|            |                            |
|------------|----------------------------|
| Time Frame | <b>2 weeks (10 blocks)</b> |
|------------|----------------------------|

### Topic

Network Security

### Essential Questions

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

### Enduring Understandings

- 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.

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### Alignment to Standards

8.1.12.C.1: Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.

8.1.12.E.1: Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.

### Learning Activities & Key Concepts and Skills

- 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)
- 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

### Career Education

CRP4: Communicate clearly and effectively with reason.

CRP7: Employ valid and reliable research strategies.

### 21st Century Skills

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|  |
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|  |
| <b>Interdisciplinary Connections</b>   |
| 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.  |
| <b>Technology Integration</b>  |
| 8.1 Educational Technology- 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. <ul style="list-style-type: none"><li>• 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.</li><li>• Students will use all the technology that makes up a modern TCP/IP network.</li></ul> |

|  |                            |
|--|----------------------------|
| Time Frame   | <b>2 weeks (10 blocks)</b> |
| <b>Topic</b>   |                            |
| Advanced Networking  |                            |
| <b>Essential Questions</b>   |                            |
| <ul style="list-style-type: none"><li>• What is client server?</li><li>• What is a peer to peer network?</li><li>• What is VOIP?</li><li>• What is a VPN and how do I set one up?</li><li>• Will we ever run out of IP addresses?</li></ul>                  |                            |
| <b>Enduring Understandings</b>   |                            |
| <ul style="list-style-type: none"><li>• Client server is a way to describe the ability to house computer resources/information away from the networked local personal computer.</li><li>• Peer to peer is a network connection between two people.</li></ul> |                            |

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- 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.

### Alignment to Standards

8.1.12.A.3: Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.  
8.1.12.E.1: Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.

### Learning Activities & Key Concepts and Skills

- 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.
- 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

### Career Education

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

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### 21st Century Skills

### Interdisciplinary Connections

### Technology Integration

8.1 Educational Technology- 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.

- 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.
- Students will use all the technology that makes up a modern TCP/IP network.

Time Frame

**2 weeks (10 blocks)**

### Topic

### Wireless Networking

### Essential 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?

### Enduring Understandings

- 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.

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- The different standards describe different wave patterns and data transfer speeds. Securing a wireless network is the same as securing a wired network.
- 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.

### Alignment to Standards

8.1.12.A.3: Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.

8.1.12.C.1: Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.

8.1.12.E.1: Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.

### Learning Activities & Key Concepts and Skills

- 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

### Career Education

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

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### 21st Century Skills

### Interdisciplinary Connections

### Technology Integration

8.1 Educational Technology- 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.

- 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.
- Students will use all the technology that makes up a modern Wireless TCP/IP network.

Time Frame

**1 weeks (5 blocks)**

### Topic

Network Management

### Essential 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?

### Enduring Understandings

- 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.

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### Alignment to Standards

8.1.8.B.1: Synthesize and publish information about a local or global issue or event (ex. telecollaborative project, blog, school web).

8.1.12.D.4: Research and understand the positive and negative impact of one's digital footprint.

### Learning Activities & Key Concepts and Skills

- 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.
- 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

### Career Education

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

### 21st Century Skills

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

### Interdisciplinary Connections

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- 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.
- Students will use all the software monitoring technology that makes up a modern wired/wireless TCP/IP network.

|  |                          |
|--|--------------------------|
| Time Frame   | <b>1 week (5 blocks)</b> |
| Topic  |                          |
| Home/Office Network Design Practical   |                          |
| Essential Questions  |                          |
| Can I research, design, set-up, secure, and monitor my own wired/wireless network?   |                          |
| Enduring Understandings  |                          |
| The overall understanding of how to research, design, set-up, secure, and monitor a wired/wireless network.  |                          |
| Alignment to Standards   |                          |
| 8.2.8.E.1: Identify ways computers are used that have had an impact across the range of human activity and within different careers where they are used. |                          |
| 8.2.8.E.2: Demonstrate an understanding of the relationship between hardware and software.   |                          |
| Learning Activities & Key Concepts and Skills  |                          |

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- 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

#### **Summative:**

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

#### **Alternative:**

- Presentation project available for struggling students

### Career Education

CRP4: Communicate clearly and effectively with reason.

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

CRP6: Demonstrate creativity and innovation.

### 21st Century Skills

### Interdisciplinary Connections

### Technology Integration

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- Students will use all the technology that makes up a modern wired/wireless TCP/IP network.

|   |                          |
|---|--------------------------|
| Time Frame  | <b>1 week (5 blocks)</b> |
| <b>Topic</b>  |                          |
| N+ Certification Practice   |                          |
| <b>Essential Questions</b>  |                          |
| <ul style="list-style-type: none"><li>● What is N+ certification and why is it necessary?</li><li>● How do I become N+ certified?</li></ul>   |                          |
| <b>Enduring Understandings</b>  |                          |
| <ul style="list-style-type: none"><li>● The understanding of what it is to be network certified.</li><li>● Knowledge of what is on the N+ certification test.</li><li>● How a person prepares and signs up for the N+ examination.</li></ul>  |                          |
| <b>Alignment to Standards</b>   |                          |
| 8.1.12.E.1: Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.   |                          |
| <b>Learning Activities &amp; Key Concepts and Skills</b>  |                          |
| <ul style="list-style-type: none"><li>● The student will understand the set list of topics that are covered by the N+ certification assessment from online research and web based resources.</li><li>● Students will take all known sources of data and comprise a study strategy.</li><li>● Lecture and discuss what the N+ exam is and why it is needed in society.</li><li>● A review session on the important material that will be assessed by the exam.</li><li>● Students will play a hands-on game that tests their knowledge of modern technology.</li><li>● Students will take the N+ practice exam to gauge preparedness for the real thing.</li></ul> |                          |

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### Assessments

#### **Formative:**

- Daily growing list of N+ sources
- Classwork/Daily Activity and Homework
- Teacher Observation
- 5 minute discussion daily on sticky questions from research/practice

#### **Summative:**

- Written research/study strategy for N+ exam
- N+ certification practice test 1
- N+ certification practice test 2

#### **Benchmark:**

- Cumulative Course Benchmark

#### **Alternative:**

- Basic course study guide
- Cumulative Course Benchmark

### Career Education

CRP7: Employ valid and reliable research strategies.

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

### 21st Century Skills

### Interdisciplinary Connections

### Technology Integration

8.1 Educational Technology- 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.

- 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.
- Students will select the media platform which best suits their project needs.

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- Professor Messer online Youtube class for N+ certification.

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

### ***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

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- 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
- 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

## Common Misconceptions

Unit 5: Cabling and Topology : The creation of cables can be as much of an art form as acquired skill.

Unit 14: Advanced Networking : A large percentage of students get lost in the complexity, an alternate research assignment is provided.

Unit 19: Home/Office Network Design Practical : The overwhelming content in this course can be too much for some students in a general elective. Alternate project available.

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