

Networking/IT Essentials

9-12, Career & Technical Education

Developed By: Mr. Vance Campbell & Mr. Vincent Vicchiariello **Effective Date:** Fall 2023 Scope and Sequence

Month	Unit	Activities
September	Unit 1:Personal Computers	 Lab - Safety Part 1: Personal Safety Part 2: Electrical Safety Part 3: Fire Safety Part 4: Compliance with Government Regulations
October	Unit 1: Personal Computers	 Lab - Build Part 1: Power supply Part 2: hard Drive Part 3: Video Card Part 4: Wire Management
November	 Unit 2: Networking Concepts Preventive Maintenance & Troubleshooting 	 Simulation build Packet Tracer Update web browser and research VPN's
December	• Unit 2: Networking Concepts	Simulation build Packet Tracer
January	 Unit 2: Networking Concepts Applied Networking 	Simulation build Packet Tracer
February	• Unit 3: Laptops & Other Mobile Devices	 Simulation build Packet Tracer Wire Simulation Add printers in Simulator Build Virtual machines in Packet Tracer
March	• Unit 3: Laptops & Other Mobile Devices	 Lab - Boot Methods Part 1: Research Boot Methods Part 2: Access BIOS / UEFI Part 3: Use a bootable USB media
April	• Unit 3: Laptops & Other Mobile Devices	Configure windows in a virtual boxUpdate phones and mobile device Personal
May	• Unit 4: Security	Create slideshow on security
June	• Unit 4: Security	• Research careers in the IT field

Unit 1

Personal Computers

Summary and Rationale

This unit introduces students to Personal Computer (PC) hardware with hands-on and career-oriented e-learning opportunities with an emphasis on practical experience to help Networking Academy students develop fundamental computer skills and essential career skills.

Recommended Pacing

10 weeks

Standards

9.3 Career and Technical Education (Link)

Career Cluster: Information Technology (IT)

9.3.IT.1	Demonstrate effective professional communication skills and practices that enable positive customer relationships.
9.3.IT.2	Use product or service design processes and guidelines to produce a quality information technology (IT) product or service.
9.3.IT.4	Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors.
9.3.IT.5	Explain the implications of IT on business development.
9.3.IT.6	Describe trends in emerging and evolving computer technologies and their influence on IT practices.
9.3.IT.7	Perform standard computer backup and restore procedures to protect IT information.
9.3.IT.9	Describe quality assurance practices and methods employed in producing and providing quality IT products and services.
9.3.IT.12	Demonstrate knowledge of the hardware components associated with information systems.
9.3.IT.13	Compare key functions and applications of software and determine maintenance strategies for computer systems.
Pathway: Info	ormation Support & Services (IT-SUP)

9.3.IT-SUP.1	Provide technology support to maintain service.		
9.3.IT-SUP.2	Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.		
9.3.IT-SUP.3	Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.		
9.3.IT-SUP.4	Perform installation, configuration and	maintenance of operating systems.	
NJSLS: Comp	outer Science & Design Thinking (2020)) (Link)	
Computing Sy	stems		
8.1.12.CS.1	Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.		
8.1.12.CS.2	Model interactions between application software, system software, and hardware.		
Engineering Design			
8.2.12.ED.1	Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers.		
NJSLS: Caree	r Readiness, Life Literacies, & Key Sl	xills (2020) (Link)	
Creativity and Innovation			
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).		
Critical Thinking and Problem-solving			
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).		
Digital Citizenship			
9.4.12.DC.8	Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection.		
Instructional Focus			
Enduring Understandings: Essential Questions:		Essential Questions:	

- Personal Computer Hardware
- What components are included within PCs
- Installations

• How do I select the appropriate computer components to build, repair, or upgrade personal computers?

Evidence of Learning (Assessments)

- Students will be evaluated by hands-on lab activities and virtual learning tools, which are integrated into the curriculum. The Virtual Laptop and Virtual Desktop are stand-alone tools that enable students to virtually disassemble and reassemble desktop and laptop computers. Both tools are designed to supplement classroom learning and provide an interactive "hands-on" experience in environments with limited physical equipment.
- Interactive formative and summative assessments
- Immediate feedback supports instructor and student evaluation of acquired knowledge and skills.
- Troubleshooting a simulated network.

Objectives (SLO)

 Students will know: Personal Computers (PC) Personal Computer (PC) components Computer disassembly Personal Computer (PC) assembly Assemble the computer Advanced computer Boot the computer Electrical power Advanced computer Computer configuration Protecting the environment Preventive maintenance and troubleshooting Preventive maintenance Troubleshooting process 	 Students will be able to: Explain how personal computer components work together. Explain the Features and Functions of components. Disassemble a PC Install components to build, repair, or upgrade personal computers. Build a computer. Hardware install and configure components to upgrade a computer. Explain how to verify BIOS and UEFI settings. Explain electrical power. Explain computer functionality. Select components to upgrade a computer to meet requirements. Explain the necessary procedures to protect the
 Protecting the environment Preventive maintenance and troubleshooting Preventive maintenance Troubleshooting process 	 Explain electrical power. Explain computer functionality. Select components to upgrade a computer to meet requirements. Explain the necessary procedures to protect the environment. Perform troubleshooting on personal computers. Explain why preventive maintenance must be performed on personal computers. Troubleshoot problems with PC and peripheral devices.

Suggested Resources/Technology Tools

- Phillips screwdriver
- Flathead screwdriver
- Hex Socket Drivers (various sizes)
- Electrostatic discharge (ESD) wrist strap and cord
- Electrostatic discharge (ESD) mat with a ground cord
- Safety glasses
- Lint-free cloth
- Electronics cleaning solution
- Flashlight
- Thermal compound
- Multimeter
- Compressed air service canister (optional due to globally varying classroom health and safety laws)
- Power supply tester

- Wire cutters
- RJ-45 Crimpers
- Cable strippers
- Modular cable tester
- Internet connection for Internet searches and driver downloads
- Printer or integrated printer/scanner/copier
- Wireless router with WPA2
- Ethernet cable and RJ-45 connectors for building and testing cables
- Various USB flash drives for moving files between computers in the lab
- Smartphones and tablets (suggested but not necessary)
- Spare parts and hardware both working and broken for parts replacement and/or troubleshooting labs

Tier 1 Modifications and Accommodations

Including special education students, Multilingual Language Learners (MLLs), students at risk of school failure, gifted and talented students, and students with 504 plans

Special Education/IEP/504 - Modifications and accommodations must be aligned to the stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to visual arts practice include, but are not limited to:

- Follow individual IEP/504 plans for specific modifications.
- Preferential seating
- Extended/Additional time for assessments
- Behavior management support
- Assignments/resources in electronic and physical format
- Break down assignments with oral directions, written directions, and visuals.
- Provide frequent reminders to stay on task and reinforce on-task behavior
- Work on organizational skills
- Provide visual supports
- Partnering/Grouping of students
- Re-teaching and review
- Multi-media approach to accommodate various learning styles
- Decrease/Modify number of project requirements
- Teacher/Aide/Para assistance
- Demonstrations of techniques on an individual level
- Show slide presentations to encourage exploration of project ideas

MLL - Teachers identify the modifications that they will use in the unit as related to the needs of their student population. Examples specific to visual arts practice include, but are not limited to:

- Allow the use of Google Translate where appropriate.
- Provide alternate ways for the student to respond (verbal/pictographic answers instead of written)
- Substitute a hands-on activity or use of different media in projects for a written activity
- Prepare and distribute advance notes
- Provide model sentence frames and sentence starters for both oral responses and written responses
- Provide additional time to complete assessments and assignments
- Model and use gestures to aid in understanding
- Model tasks by giving one or two examples before releasing students to work independently
- Present instructions both verbally and visually
- Simplify written and verbal instructions
- Speak clearly and naturally, and try to enunciate words, especially their ending sounds.
- Provide Visual, Graphic, Interactive, and/or Sensory Supports

- Simplify the language, format, and directions of the assessment
- Allow for alternate seating for proximity to peer helper or teacher as necessary
- When showing videos, use Closed Captioning.
- Support use of student's primary language by translating key words in directions, or key vocabulary terms or giving students opportunities to communicate in their primary language (written or orally).

Gifted and Talented/Enrichment - Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples specific to visual arts practice include, but are not limited to:

- Complex, in-depth research assignments
- Independent study where applicable
- Provide a variety of individualized work centers or student choice
- Lead demonstrations for class
- Individual presentation

- □ Act as a responsible and contributing citizen and employee.
- □ Apply appropriate academic and technical skills.
- □ Attend to personal health and financial well being.
- □ Communicate clearly and effectively and with reason.
- □ Consider the environmental, social and economic impacts of decisions.
- Demonstrate creativity and innovation.
- **u** Employ valid and reliable research strategies.
- □ Utilize critical thinking to make sense of problems and persevere in solving them.
- □ Model integrity, ethical leadership, and effective management.
- □ Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity.
- □ Work productively in teams while using cultural global competence.

Unit 2

Networking Concepts

Summary and Rationale

Networking is the building block for effective communication. Communication is the universal currency that knits us together and drives our day to day operations. There are several reasons why networking is essential to a business, institution, or individual. These benefits include: Cut back on costs, Boost storage capacity and volume, Optimize convenience and flexibility, Streamline communication. Drawbacks of computer networking and Unsecured network.

Recommended Pacing

12 Weeks

Standards

9.3 Career and Technical Education (Link)

Career Cluster: Information Technology (IT)

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9.3.IT.6	Describe trends in emerging and evolving computer technologies and their influence on IT practices.
9.3.IT.7	Perform standard computer backup and restore procedures to protect IT information.
9.3.IT.8	Recognize and analyze potential IT security threats to develop and maintain security requirements.
9.3.IT.9	Describe quality assurance practices and methods employed in producing and providing quality IT products and services.
9.3.IT.12	Demonstrate knowledge of the hardware components associated with information systems.
9.3.IT.13	Compare key functions and applications of software and determine maintenance strategies for computer systems.

Career Cluster: Network Systems (IT-NET)		
9.3.IT-NET.1	Analyze customer or organizational network system needs and requirements.	
9.3.IT-NET.2	Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).	
9.3.IT-NET.3	Design a network system using technologies, tools and standards	
9.3.IT-NET.4	Perform network system installation and configuration.	
Pathway: Info	rmation Support & Services (IT-SUP)	
9.3.IT-SUP.1	Provide technology support to maintain service.	
9.3.IT-SUP.2	Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.	
9.3.IT-SUP.3	Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.	
9.3.IT-SUP.4	Perform installation, configuration and maintenance of operating systems.	
9.3.IT-SUP.5	Demonstrate the use of networking concepts to develop a network.	
9.3.IT-SUP.6	Evaluate the effectiveness of an information system.	
9.3.IT-SUP.7	Employ system installation and maintenance skills to setup and maintain an information system.	
NJSLS: Computer Science & Design Thinking (2020) (Link)		
Computing Sy	stems	
8.1.12.CS.1	Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.	
8.1.12.CS.2	Model interactions between application software, system software, and hardware.	
Networks and	Networks and the Internet	
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.2	Evaluate security measures to address various common security threats.	
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.NI.4	Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.		
Engineering D	esign		
8.2.12.ED.1	Use research to design and create a pro- modifications based on input from pote	oduct or system that addresses a problem and make ential consumers.	
NJSLS: Caree	r Readiness, Life Literacies, & Key S	kills (2020) (Link)	
Creativity and	Innovation		
9.4.12.CI.1	Demonstrate the ability to reflect, anal	yze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).	
Critical Think	ing and Problem-solving		
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).		
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Digital Citizen	ship		
9.4.12.DC.8	9.4.12.DC.8 Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection.		
	Instru	ctional Focus	
Enduring Understandings:		Essential Questions:	
Networking Concepts		• How do computers communicate on a network?	
Evidence of Learning (Assessments)			
 Explaining how computers communicate on a network by creating a slideshow and building a success simulation. Interactive formative and summative assessments Use of PC Hardware and Software curriculums, which are supported by an advanced online delivery system that presents assessment tasks, automatically scores and records results, and provides feedback to aid in learning. Multiple-choice assessments Troubleshooting a simulated network 			

Students will know:

- Network Components and Types
- Networking Protocols, Standards, and
- Services
- Network Devices
- Network Cables
- Applied Networking
- Device to Network Connection
- Basic Troubleshooting Process for Networks
- Laptops and Other Mobile Devices
- Characteristics of Laptops and Other Mobile Devices.
- Laptop Configuration
- Laptop Hardware and Component Installation and Configuration
- Other Mobile Device Hardware Overview
- Network Connectivity and Email
- Preventive Maintenance for Laptops and Other Mobile Devices.
- Basic Troubleshooting Process for Laptops and other Mobile Devices
- Printers
- Common Printer Features
- Printer Type Comparison
- Installing and Configuring
- Sharing Printers
- Maintaining and Troubleshooting

Students will be able to:

- Explain the components and types of computer networks.
 - Explain networking protocols, standards, and services.
 - Explain the purpose of devices on a network.
 - Build a network cable.
 - Troubleshoot problems and solutions related to networks.
 - Explain how to troubleshoot Laptops and other Mobile Devices.
 - Explain the features and functions of laptops and other mobile devices.
 - Explain how to configure laptop power settings and wireless settings.
 - Explain how to remove and install laptop components.
 - Explain the purpose and characteristics of other mobile devices.
 - Explain how to configure network connectivity and email on mobile devices.
 - Use common preventive maintenance techniques for Laptops and other Mobile Devices.
 - Explain how to troubleshoot Laptops and other Mobile Devices.
 - Install a printer to meet requirements.
 - Explain the purpose and characteristics of different types of printers.
 - Compare Different Types of Printers
 - Printers Install a printer in packet tracer
 - Configure printer sharing.
 - Printers Explain how to improve printer availability.

Suggested Resources/Technology Tools

- Chromebook/Laptop
- Cisco Packet Tracer

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- Work on organizational skills
- Provide visual supports
- Partnering/Grouping of students

- Re-teaching and review
- Multi-media approach to accommodate various learning styles
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- Independent study where applicable
- Provide a variety of individualized work centers or student choice
- Lead demonstrations for class
- Individual presentation

- $\hfill\square$ Act as a responsible and contributing citizen and employee.
- □ Apply appropriate academic and technical skills.
- □ Attend to personal health and financial well being.
- □ Communicate clearly and effectively and with reason.
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- □ Use technology to enhance productivity.
- □ Work productively in teams while using cultural global competence.

Unit 3

Laptops & Other Mobile Devices

Summary and Rationale

Students who complete this unit will be able to differientate a laptop from other mobile devices. Students will also be able to connect devices to the Internet and share resources in a networked environment. In addition, students are able to understand the use for different devices and how they can be adapted to different situations.

Recommended Pacing

12 Weeks

Standards

9.3 Career and Technical Education (Link)

Career Cluster: Information Technology (IT)

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9.3.IT-NET.2	Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).	
9.3.IT-NET.3	Design a network system using technologies, tools and standards	
9.3.IT-NET.4	Perform network system installation and configuration.	
Pathway: Prog	gramming & Software Development (IT-PRG)	
9.3.IT-PRG.3	Analyze system and software requirements to ensure maximum operating efficiency.	
9.3.IT-PRG.4	Demonstrate the effective use of software development tools to develop software applications.	
9.3.IT-PRG.6	Program a computer application using the appropriate programming language.	
9.3.IT-PRG.7	Demonstrate software testing procedures to ensure quality products.	
Pathway: Information Support & Services (IT-SUP)		
9.3.IT-SUP.1	Provide technology support to maintain service.	
9.3.IT-SUP.2	Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.	
9.3.IT-SUP.3	Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.	
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Engineering D	lesign		
8.2.12.ED.1	Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers.		
Nature of Tec	hnology		
8.2.2.NT	Model and explain how a product works after taking it apart, identifying the relationship of each part, and putting it back together.		
8.2.2.NT.2:	Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.		
NJSLS: Caree	er Readiness, Life Literacies, & Key Sl	xills (2020) (Link)	
Creativity and Innovation			
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).		
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Digital Citizenship			
9.4.12.DC.8	Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection.		
Instructional Focus			
Enduring Understandings: Essential Questions:		Essential Questions:	

• Virtualization and cloud computing

Evidence of Learning (Assessments)

- Students will be evaluated by Hands-on lab activities and virtual learning tools are integrated into the curriculum.
- The Virtual Laptop and Virtual Desktop are stand-alone tools that enable students to virtually disassemble and reassemble desktop and laptop computers. Both tools are designed to supplement classroom learning and provide an interactive "hands-on" experience in environments with limited physical equipment.

Objectives (SLO) Students will know: Students will be able to: • Describe virtualization and cloud computing Virtualization • Explain Cloud and Virtualization. • Cloud Computing • • Windows Installation Compare and contrast cloud computing concepts • • Modern Operating Systems Install Windows operating systems Disk Management Explain operating system requirements. • • Installation and Boot Sequence Create a partition in Windows using the Disk • Windows Configuration Management Utility. • Install a Windows Operating System • Windows Desktop and File Explorer • Configure Windows using Control Panels Perform management and maintenance of Windows • operating systems System Administration Command- Line Tools Configure the Windows Desktop and File Explorer. • Windows Networking Configuring Windows with Control Panels. • Common Preventive Maintenance Use Windows tools and utilities to manage Windows • • Techniques for Operating Systems system. **Basic Troubleshooting Process for Windows** Use Microsoft Windows command line tools. • Operating System Configure a Windows computer to work on a network. Mobile, Linux, and OSX Operating Systems Use common preventive maintenance on a computer • • Mobile Operating Systems using Microsoft Windows tools. • Methods for Securing Mobile Devices Explain how to troubleshoot Microsoft Windows • • macOS Operating Systems operating system. • Explain how to configure, secure, and troubleshoot Basic Troubleshooting Process for Mobile, Linux, and macOS Operating Systems mobile, Mac, and Linux operating systems Explain the purpose and characteristics of mobile • operating systems. Explain methods for securing mobile devices. Explain the purpose and characteristics of macOS and Linux operating systems. Explain how to troubleshoot other operating systems. •

Suggested Resources/Technology Tools

- Chromebook/Laptop
- Cisco Packet Tracer (newest version)

Tier 1 Modifications and Accommodations

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- Provide a variety of individualized work centers or student choice
- Lead demonstrations for class
- Individual presentation

- □ Act as a responsible and contributing citizen and employee.
- □ Apply appropriate academic and technical skills.
- □ Attend to personal health and financial well being.
- □ Communicate clearly and effectively and with reason.
- □ Consider the environmental, social and economic impacts of decisions.
- Demonstrate creativity and innovation.
- **□** Employ valid and reliable research strategies.
- **U**tilize critical thinking to make sense of problems and persevere in solving them.
- □ Model integrity, ethical leadership, and effective management.
- □ Plan education and career paths aligned to personal goals.
- □ Use technology to enhance productivity.
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Security

Summary and Rationale

The need for cyber security professionals is expected to have a 28% growth by 2026 according to the Bureau of Labor Statistics. This percentage is way higher than the national average, which means that the field will expand over the years. Students will gain knowledge in the field of security, while looking at various security threats. Students will also look into the various types of security systems, networks and types of technicians.

Recommended Pacing

10 Weeks

Standards

9.3 Career and Technical Education (Link)

Career Cluster: Information Technology

9.3.IT.1	Demonstrate effective professional communication skills and practices that enable positive customer relationships.
9.3.IT.2	Use product or service design processes and guidelines to produce a quality information technology (IT) product or service.
9.3.IT.4	Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors.
9.3.IT.5	Explain the implications of IT on business development.
9.3.IT.6	Describe trends in emerging and evolving computer technologies and their influence on IT practices.
9.3.IT.7	Perform standard computer backup and restore procedures to protect IT information.

9.3.IT.8	Recognize and analyze potential IT security threats to develop and maintain security requirements.	
9.3.IT.9	Describe quality assurance practices and methods employed in producing and providing quality IT products and services.	
9.3.IT.12	Demonstrate knowledge of the hardware components associated with information systems.	
9.3.IT.13	Compare key functions and applications of software and determine maintenance strategies for compute systems.	
Career Clu	ster: Network Systems (IT-NET)	
9.3.IT- NET.1	Analyze customer or organizational network system needs and requirements.	
9.3.IT- NET.2	Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, powe and security).	
9.3.IT- NET.3	Design a network system using technologies, tools and standards	
9.3.IT- NET.4	Perform network system installation and configuration.	
Pathway: F	Programming & Software Development (IT-PRG)	
9.3.IT- PRG.3	Analyze system and software requirements to ensure maximum operating efficiency.	
9.3.IT- PRG.4	Demonstrate the effective use of software development tools to develop software applications.	
9.3.IT- PRG.6	Program a computer application using the appropriate programming language.	
9.3.IT- PRG.7	Demonstrate software testing procedures to ensure quality products.	
Pathway: I	nformation Support & Services (IT-SUP)	
9.3.IT- SUP.1		
0.2 IT	Provide technology support to maintain service.	
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9.3.IT- SUP.2 9.3.IT- SUP.3 9.3.IT- SUP.4	Provide technology support to maintain service. Manage operating systems and software applications, including maintenance of upgrades, patches and service packs. Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems. Perform installation, configuration and maintenance of operating systems.	

9.3.IT- SUP.6	Evaluate the effectiveness of an information system.			
9.3.IT- SUP.7	Employ system installation and maintenance skills to setup and maintain an information system.			
NJSLS: Computer Science & Design Thinking (2020) (Link)				
Computing Systems				
8.1.12.CS.1	Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.			
8.1.12.CS.2	Model interactions between application software, system software, and hardware.			
Networks and the Internet				
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.2	Evaluate security measures to address various common security threats.			
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.NI.4	Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.			
Engineering Design				
8.2.12.ED.1	Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers.			
8.2.12.ED.6	Analyze the effects of changing resources when designing a specific product or system (e.g., materials, energy, tools, capital, labor).			
Nature of Technology				
8.2.2.NT	Model and explain how a product works after taking it apart, identifying the relationship of each part, and putting it back together.			
8.2.2.NT.2:	Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.			
NJSLS: Career Readiness, Life Literacies, & Key Skills (2020) (Link)				
Creativity and Innovation				
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).			

Critical Thinking and Problem-solving					
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).				
Digital Citizenship					
9.4.12.DC.8	Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection.				
Instructional Focus					
Enduring Understandings:		Essential Questions:			
• Security Threats to local and wide area networks		• What are the most imporant Security Threats, where do they come from and how we mitigate them			
Evidence of Learning (Assessments)					
 Configuring a network to mitigate and try to eliminate potential threats. Hands-on lab activities Virtual learning tools 					
Objectives (SLO)					
 Students will know: Security Security Threats Security Procedures Securing Windows Workstations Wireless Security Basic Troubleshooting Process for Security The IT Professional Communication Skills and the IT Professional Operational Procedures Ethical and Legal Considerations Call Center Technicians 		 Students will be able to: Implement basic host, data, and network security. Explain Security Threats. Explain Security Procedures. Configure basic security settings and policies for end devices. Configure wireless security. Explain the six steps of the troubleshooting process for security. Explain the roles and responsibilities of the IT Professional. Explain why strong communication skills are critical for IT work. Explain how to manage change and unplanned disruptions in a business environment. Explain appropriate behavior when faced with the legal and ethical issues that arise in the IT industry. Explain the call center environment and technician responsibilities. 			
	Suggested Resources/Technology Tools				

- Chromebook/Laptop
- Packet Tracer (newest version)

Tier 1 Modifications and Accommodations

Including special education students, Multilingual Language Learners (MLLs), students at risk of school failure, gifted and talented students, and students with 504 plans

Special Education/IEP/504 - Modifications and accommodations must be aligned to the stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to visual arts practice include, but are not limited to:

- Follow individual IEP/504 plans for specific modifications.
- Preferential seating
- Extended/Additional time for assessments
- Behavior management support
- Assignments/resources in electronic and physical format
- Break down assignments with oral directions, written directions, and visuals.
- Provide frequent reminders to stay on task and reinforce on-task behavior
- Work on organizational skills
- Provide visual supports
- Partnering/Grouping of students
- Re-teaching and review
- Multi-media approach to accommodate various learning styles
- Decrease/Modify number of project requirements
- Teacher/Aide/Para assistance
- Demonstrations of techniques on an individual level
- Show slide presentations to encourage exploration of project ideas

MLL - Teachers identify the modifications that they will use in the unit as related to the needs of their student population. Examples specific to visual arts practice include, but are not limited to:

- Allow the use of Google Translate where appropriate.
- Provide alternate ways for the student to respond (verbal/pictographic answers instead of written)
- Substitute a hands-on activity or use of different media in projects for a written activity
- Prepare and distribute advance notes
- Provide model sentence frames and sentence starters for both oral responses and written responses
- Provide additional time to complete assessments and assignments
- Model and use gestures to aid in understanding
- Model tasks by giving one or two examples before releasing students to work independently
- Present instructions both verbally and visually
- Simplify written and verbal instructions
- Speak clearly and naturally, and try to enunciate words, especially their ending sounds.
- Provide Visual, Graphic, Interactive, and/or Sensory Supports
- Simplify the language, format, and directions of the assessment
- Allow for alternate seating for proximity to peer helper or teacher as necessary
- When showing videos, use Closed Captioning.
- Support use of student's primary language by translating key words in directions, or key vocabulary terms or giving students opportunities to communicate in their primary language (written or orally).

Gifted and Talented/Enrichment - Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples specific to visual arts practice include, but are not limited to:

- Complex, in-depth research assignments
- Independent study where applicable
- Provide a variety of individualized work centers or student choice
- Lead demonstrations for class
- Individual presentation

- □ Act as a responsible and contributing citizen and employee.
- □ Apply appropriate academic and technical skills.
- Attend to personal health and financial well being.
- $\hfill\square$ Communicate clearly and effectively and with reason.
- □ Consider the environmental, social and economic impacts of decisions.
- Demonstrate creativity and innovation.
- **D** Employ valid and reliable research strategies.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- □ Model integrity, ethical leadership, and effective management.
- □ Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity.
- □ Work productively in teams while using cultural global competence.