

# Orange Public Schools



## Curriculum Guide

### Computer TIA A+

### Grades 10-12

#### Computer TIA A+ Teacher

Ederson Jean

Revisions edited 2019-2020 by Jahmel K. Drakeford

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# **The Orange Board of Education**

## **Vision and Mission Statement**

### **Vision**

*"The Orange Public School District commits to provide a safe and caring environment where each student is expected to grow and succeed. We pledge to prepare all students with equitable opportunities for college and career readiness, leading to lifelong learning and responsible citizenship in a competitive global community."*

### **Mission**

*The Orange Public School District in collaboration with all stakeholders is responsible for promoting the academic, social, emotional and personal success of all students. With a commitment to academic excellence, the district provides teachers, families, and administrators the tools needed for all students to reach their full potential. The district serves all students in our schools, acknowledging their unique backgrounds, cultural perspectives and learning styles. The district recognizes that curiosity, discipline, integrity, responsibility and respect are necessary for success. The Orange Public School District cultivates a community of 21st century learners where students take ownership of the learning process, achieve high standards of excellence, and focus on academics.*

## Computer TIA A+

Content Area:	Cisco: Computer TIA A+	Grade(s)	10-12
Unit Plan Title:	Personal Computer Hardware		
Career Ready Practices			
CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.			
Overview/Rationale			
<b>I. OVERVIEW</b>  This course covers the fundamentals of computer hardware and software and advanced concepts such as security, networking, and the responsibilities of an IT professional. Students who complete this course will be able to describe the internal components of a computer, assemble a computer system, install an operating system, and troubleshoot using system tools and diagnostic software. Students will also be able to connect to the Internet and share resources in a networked environment. New topics in this version include mobile devices such as tablets and smartphones and client side virtualization. Expanded topics include the Microsoft Windows 7 operating system, security, networking, and troubleshooting.  Hands-on lab activities are an essential element of the course. The Virtual Laptop and Virtual Desktop are standalone tools designed to supplement classroom learning and provide an interactive "hands-on" experience in learning environments with limited physical equipment.			

Cisco Packet Tracer activities are designed for use with Packet Tracer 5.3. The use of Packet Tracer will support alignment with the new CompTIA A+ certification objectives.

In addition, students gain confidence with the components of desktop and laptop computers by learning the proper procedures for hardware and software installations, upgrades, and troubleshooting.

By the end of the course, students will be able to complete the following objectives:

- Define information technology (IT) and describe the components of a personal computer.
- Describe how to protect people, equipment, and environments from accidents, damage, and contamination.
- Perform a step-by-step assembly of a desktop computer.
- Explain the purpose of preventive maintenance and identify the elements of the troubleshooting process.
- Install and navigate an operating system.
- Configure computers to connect to an existing network.
- Upgrade or replace components of a laptop based on customer needs.
- Describe the features and characteristics of mobile devices.
- Install and share a printer.
- Implement basic physical and software security principles.
- Apply good communication skills and professional behavior while working with customers.
- Perform preventive maintenance and advanced troubleshooting.
- Assess customer needs, analyze possible configurations, and provide solutions or recommendations for hardware, operating systems, networking, and security.

## **II. RATIONALE**

We live in an increasingly connected world, creating a global economy and a growing need for technical skills. Computer Repair and Design provides a comprehensive overview of computer fundamentals. It is intended for students who may want to pursue a career in IT and gain practical knowledge of how a computer works. Computer Repair and Design will help students prepare for entry-level IT positions in various environments. It will also help students develop greater skills and confidence in working with desktop and laptop computers.

This course provides an excellent introduction to the IT industry and interactive exposure to personal computers, hardware, and operating systems. Students participate in hands-on activities and lab-based learning to become familiar with various hardware and software components and discover best practices in maintenance and safety.

## Standard(s) NJSL

### 9.3 Career and Technical Education Standards

- 9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals.
- 9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors.
- 9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information.
- 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.
- 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-PRG.1 Analyze customer software needs and requirements.
- 9.3.IT-PRG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.
- 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.

#### Technology Standard(s)

- 8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.
- 8.1.2.A.2 Create a document using a word processing application.

#### Interdisciplinary Standard(s)

##### RST WHST

- CCSS.ELA-LITERACY.W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.
- CCSS.ELA-LITERACY.W.K.3 Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.
- CCSS.ELA-LITERACY.W.1.1 Write opinion pieces in which they introduce the topic or name the book they are writing about, state an opinion, supply a reason for the opinion, and provide some sense of closure.

- CCSS.ELA-LITERACY.W.1.2 Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.
- WHST.11-12.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- WHST.11-12.5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
- WHST.11-12.10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

#### Essential Question(s)

- What are the IT industry certifications?
- Why is it important to know the different names and functions of the components inside a personal computer?
- How will these skills benefit me in future?
- What is the purpose of safe working conditions and procedures?
- How will knowing safe work procedures benefit me in the future?
- What are the tools and software necessary for proper use with personal computer components and what is their purpose?
- What are the steps to successfully assembling a desktop computer?
- Why are these skills important to know?
- How will these skills benefit me in future?
- What is the purpose of preventive maintenance?
- Why is it important to work in a step by step of the troubleshooting process?
- How will these skills benefit me in future?

#### Enduring Understandings

- Identify the parts of a personal computer
- Understand why the computer components are essential for a personal computer to function
- Determine how the Cisco IT Essentials program is able to help at home, in a business, and/or their future careers in the IT industry
- Explain the purpose of safe working conditions and procedures.
- Identify tools and software used with personal computer component and their purposes
- Explain the purpose of safe working conditions and procedures.
- Implement proper tool use.
- Disassemble and assemble a computer.
- Install the power supply, attach the components to the motherboard and install the motherboard.
- Install drives in external bays and install adapter cards.
- Connect all internal cables and re-attach the side panels and connect external cables to the computer.
- Boot computer for the first time.
- Explain the purpose of preventive maintenance.
- Identify the steps of the troubleshooting process.
- Implement proper tool use.

In this unit plan, the following 21<sup>st</sup> Century themes and skills are addressed.

Check all that apply. 21 <sup>st</sup> Century Themes			Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill. 21 <sup>st</sup> Century Skills		
	X	Global Awareness		E, A	Creativity and Innovation
	X	Environmental Literacy		E, T, A	Critical Thinking and Problem Solving
		Health Literacy		E, A	Communication

		Civic Literacy	E, T, A	Collaboration
	X	Financial, Economic, Business, and Entrepreneurial Literacy		
Student Learning Targets/Objectives				
<p>Students will ....</p> <ul style="list-style-type: none"> <li>● Select the appropriate computer components to build, repair, or upgrade personal computers.</li> <li>● Explain how personal computer components work together.</li> <li>● Explain the Features and Functions of components.</li> <li>● Disassemble a PC.</li> <li>● Install components to build, repair, or upgrade personal computers.</li> <li>● Build a computer</li> <li>● Install and configure components to upgrade a computer.</li> <li>● Explain how to verify BIOS and UEFI settings.</li> <li>● Electrical Power Explain electrical power.</li> <li>● Explain computer functionality.</li> <li>● Select components to upgrade a computer to meet requirements</li> <li>● Explain the necessary procedures to protect the environment</li> <li>● Perform Troubleshooting on personal computers.</li> <li>● Explain why preventive maintenance must be performed on personal computers.Process</li> <li>● Troubleshoot problems with PC and Peripheral devices</li> </ul>				
Assessments				

- Pre and Formative: Daily —do now/warm-up responses. Ability to demonstrate proficiency in key unit concepts in class discussions. Student Portfolio of key work products. Shared responses to Essential Questions. Interim quizzes. Written and reading-based homework.
- Summative: End of unit written exam
- Authentic: Hands-on Lab:
  - Computer Disassembly Hands-on Lab: Install the Power Supply
  - Optional Virtual Desktop Activity
  - Hands-on Lab: Install the Motherboard
  - Optional Virtual Desktop Activity
  - Optional Virtual Desktop Activity
  - Hands-on Lab: Install the Drives
  - Optional Virtual Desktop Activity
  - Hands-on Lab: Install Adapter Cards
  - Optional Virtual Desktop Activity
  - Hands-on Lab: Install Internal Cables
  - Optional Virtual Desktop Activity
  - Hands-on Lab: Complete the Computer Assembly
  - Optional Virtual Desktop Activity
  - Hands-on Lab: Boot the Computer

#### Teaching and Learning Actions

##### Instructional Strategies

Academic vocabulary and language; Accountable talk; Adapting to learning styles/multiple intelligences; Analysis of student work; Cues, questions, activating prior knowledge; Current events; Direct instruction; Discovery/Inquiry-based learning; Document-based questions; Effective questioning; Field experience, field trip, or field study; Flexible/strategic grouping; Formative assessment process; Guest speakers; Hands-on learning; Identifying similarities and differences; Integration of content areas; Lecture; Learning centers; Mastery learning; Modeling; Music and songs; Nonlinguistic representations; Note booking/journaling; Peer teaching/collaboration; Project-based learning; Realia; Reinforcing effort and providing recognition; Role play/simulations/drama; Student goal setting; Student self-assessment; Summarizing and note taking; Targeted feedback; Word wall

## MTSS

### Special education students::

- Adhere to all modifications and health concerns stated in each IEP.
- Give students a MENU options, allowing students to pick assignments from different levels based on difficulty.
- Use the NEWSELA software, which can revise the reading Lexile level to meet students at current reading level.
- Accommodating Instructional Strategies Reading Aloud, Graphic Organizers, Reading Study Guides, one-on-one instruction, class website (Google Classroom), Handouts, Definition List, Syllabus, Large Print, Outlines
- Utilize Snap-n-Read and Co-Writer

### English Language Learners (ELL) students:

- Use the Britannica launch pack software; give students the option to change the language of the article to the student's native language for most articles.
- Snap and Read Google extension addition. Will read to the student in the language selected.
- Vocabulary Spelling City word banks
- Use visuals whenever possible to support classroom instruction and classroom activities.
- Teacher modeling and written instructions for every assignment

### At risk of failure students:

- Give students a MENU options allowing students to pick activities based on interest that address the objectives and standards of the unit.
- Modified Instructional Strategies, Reading alouds, Graphic Organizers, Reading Study Guides, small learning group instruction, class website (Google Classroom), Syllabus, inclusion of more visuals and Films, Field Trips, Google Expeditions, Peer Support, one on one instruction
- Constant parental contact along with mandatory tutoring appointments.
- Academic Contracts

### Gifted and talented students:

- Modified instructional strategies Socratic Seminar, Group Discussion, Think-Pair-Share, Individual Assignments graded on a more rigorous rubric, Multimedia Projects, working with more primary source documents and completing Case Studies.
- Student led classroom instruction also Project Based Learning.

Students with a 504:

Adhere to all modifications and health concerns stated in 504 plan.  
Then assess the academics of the student to implement the necessary  
modifications as described in this document

## Activities

D

### Chapter 1: Activities

#### **1.1.1.4 Worksheet – Ohm’s Law**

- Worksheet is new to the curriculum.
- Review the Ohm’s law example provided in page 1.1.1.3 with students to check for understanding before assigning Worksheet – Ohm’s Law.
  - Consider assigning the worksheet as homework.

#### **1.2.1.11 Worksheet – Research Computer Components**

- Conduct Internet research to pre-screen online resources for use in completing the worksheet and create a list for students.
- Prior to completing the assignment, ask students to create a graphic organizer that helps them recognize what makes components compatible.

#### **1.3.1.6 Worksheet – Build a Specialized Computer System**

- Worksheet is new to the curriculum.
- Conduct Internet research to pre-screen online resources for use in completing the worksheet and create a list for students.
- Ask students to complete the worksheets in groups and present their findings to class.

### Chapter 2: Activities

#### **2.2.2.3 - Worksheet - Diagnostic Software**

#### **2.2.4.4 – Lab- Using a Multimeter and a Power Supply Tester**

- Lab is new to the curriculum.
- Emphasize safety when measuring electrical quantities.

#### **2.2.4.5 – Lab – Testing UTP Cables Using a Loopback Plug and a Cable Meter**

- Lab is new to the curriculum.

#### **2.2.4.7 – Lab- Computer Disassembly**

- Emphasize the importance of taking notes and being organized during disassembly. Have all students document the disassembly process. Allow students to take pictures during disassembly.
- Provide students with a framework for organization during disassembly. Ensure students have antistatic bags for components and containers for screws.
- Have students work in pairs or groups dependent on equipment available.
- **Chapter 2 Quiz**

### **Chapter 3 Activities**

What activities are associated with this chapter?

#### **3.1.1.3 Lab – Install the Power Supply**

- Review the safety procedures detailed in Chapter 2 prior to completing this lab.
- Emphasize that students should not open the power supply under any circumstances.

#### **3.1.2.4 Lab – Install the Motherboard**

- If you do not wish to have your students install the components in this lab, due to the expense and fragility of these components, review the steps with a classroom demonstration.

#### **3.1.3.4 Lab – Install the Drives**

- Make sure that students install the drives right side up so that the media can be inserted into the drive with the label facing up.

#### **3.1.4.5 Lab – Install Adapter Cards**

- Prior to performing the lab, ask students to identify the different types of expansion slots.

#### **3.1.5.3 Lab – Install Internal Cables**

- Make sure that students are correctly aligning connectors before inserting them by modeling the process before completion of the lab.

#### **3.1.5.5 Lab – Install Front Panel Cables**

- Lab is new to the curriculum.
- Have students install the front panel connectors from multiple cases if possible.
- Make sure that students are correctly aligning connectors before inserting them by modeling the process before completion of the lab.

#### **3.1.5.8 Lab – Complete the Computer Assembly**

- Make sure that students are correctly aligning connectors before inserting them by modeling the process before completion of the lab.

#### **3.2.2.5 Lab – Boot the Computer**

- Lab has been updated to reflect the new course structure.

Ask students to verify that all components have been installed correctly prior to booting the computer.

#### **3.3.1.6 Lab – BIOS File Search**

- Make sure that students know the correct

key combination for entering Setup upon booting the computer.

### **3.3.3.2 Worksheet – Upgrade Hardware**

- Conduct Internet research to pre-screen online resources for use in completing the worksheet and create a list for students.
- Prior to completing the assignment, ask students to create a graphic organizer that helps them recognize what makes components compatible.

### **3.2.2.5 Lab – Boot the Computer**

- Lab has been updated to reflect the new course structure.
- Ask students to verify that all components have been installed correctly prior to booting the computer.

### **3.3.1.6 Lab – BIOS File Search**

- Make sure that students know the correct key combination for entering Setup upon booting the computer.

### **3.3.3.2 Worksheet – Upgrade Hardware**

- Conduct Internet research to pre-screen online resources for use in completing the worksheet and create a list for students.
- Prior to completing the assignment, ask students to create a graphic organizer that helps them recognize what makes components compatible.

## **Chapter 4: Activities**

What activities are associated with this chapter?

- There are no labs in this chapter.
- **Chapter 4 Quiz**

D

## Experiences

Field Trips  
Guest Speakers  
Internships  
Job Shadowing

## Resources

- [WWW.Cisco.netacad.net](http://WWW.Cisco.netacad.net)
- IT Essentials Course  
Booklet, Version 5 By  
Cisco Networking  
Academy Published Mar  
25, 2013 by Cisco Press.
- IT Essentials Lab Manual,  
5th Edition By Cisco  
Networking Academy  
Published Mar 19, 2013 by  
Cisco Press.
- IT Essentials, 5th Edition
- By Cisco Networking Academy
- Published Jul 16, 2013 by Cisco Press. Part of the Companion Guide series. Copyright 2014

## Lab PC Repair Tools

The computer toolkit should include the following tools:

- Phillips screwdriver
- Flathead screwdriver
- Hex socket drivers (various sizes)
- Needle-nose pliers
- 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 (optional)
- Compressed air service canister (optional due to varying classroom health and safety laws)
- Power supply tester (optional)
- Wire cutters
- Crimpers (RJ-45)
- Cable strippers
- Cable testers
- Network loopback plugs (optional)

## Additional Required Lab Equipment

- The ITE lab topologies require the following equipment and accessories:
- 1 Internet connection for Internet searches and driver downloads (this could be the instructor's workstation)
- 1 printer or integrated printer/scanner/copier for the class to share

Suggested Time Frame:

10 Weeks

D- Indicates differentiation at the Lesson Level.

NJASCD, 12 Centre Drive Monroe Township, NJ 08831 [njascd.org](http://njascd.org)

## Computer TIA A+

Content Area:	Cisco: Computer TIA A+	Grade(s)	10-12
Unit Plan Title:	Networks		
Career Ready Practices			
CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.			
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## **II. RATIONALE**

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- 9.3.IT-PRG.4 Demonstrate the effective use of software development tools to develop software applications.

#### Technology Standard(s)

- 8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.
- 8.1.2.A.2 Create a document using a word processing application.

#### Interdisciplinary Standard(s)

##### RST WHST

- CCSS.ELA-LITERACY.W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.
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- CCSS.ELA-LITERACY.W.1.1 Write opinion pieces in which they introduce the topic or name the book they are writing about, state an opinion, supply a reason for the opinion, and provide some sense of closure.

- CCSS.ELA-LITERACY.W.1.2 Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.
- WHST.11-12.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- WHST.11-12.5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
- WHST.11-12.10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

#### Essential Question(s)

- What is the purpose of an operating system?
- Based on a customer's needs, how does one decide on which operating system to use?
- Why is it important to have GUI operating systems?
- What are the procedures for installing an operating system?
- How will these skills benefit me in future?
- What is a computer network?
- What are the benefits of a computer network?
- What are the different types of computer networks?
- What are important networking concepts, standards and technologies
- What are the physical components of a network?
- What are the LAN topologies and architectures?
- What are important maintenance and troubleshooting techniques for a network?
- When is it necessary to upgrade a network?
- Why are these skills important to know?

- How will these skills benefit me in future?

## Enduring Understandings

- Identify the parts of a personal computer
- Understand why the computer components are essential for a personal computer to function
- Determine how the Cisco IT Essentials program is able to help at home, in a business, and/or their future careers in the IT industry
- Explain the purpose of safe working conditions and procedures.
- Identify tools and software used with personal computer component and their purposes
- Explain the purpose of safe working conditions and procedures.
- Implement proper tool use.
- Disassemble and assemble a computer.
- Install the power supply, attach the components to the motherboard and install the motherboard.
- Install drives in external bays and install adapter cards.
- Connect all internal cables and re-attach the side panels and connect external cables to the computer.
- Boot computer for the first time.
- Explain the purpose of preventive maintenance.
- Identify the steps of the troubleshooting process.
- Implement proper tool use.
- Explain the purpose of an operating system.
- Install, troubleshoot, and repair operating systems.
- Explain the purpose of operating systems and GUI
- Environments.
- Identify and apply common preventive maintenance techniques for operating systems.
- Troubleshoot operating systems.
- Explain the principles of networking.
- Describe types of networks
- Describe basic networking concepts and technologies
- Describe the physical components of a network
- Describe LAN topologies
- Identify Ethernet standards

- Explain OSI and TCP/IP data model?

In this unit plan, the following 21<sup>st</sup> Century themes and skills are addressed.

Check all that apply.  
21<sup>st</sup> Century Themes

Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.

21<sup>st</sup> Century Skills

X

Global Awareness

E, A

Creativity and Innovation

X

Environmental Literacy

E, T, A

Critical Thinking and  
Problem Solving

Health Literacy

E, A

Communication

		Civic Literacy	E, T, A	Collaboration
	X	Financial, Economic, Business, and Entrepreneurial Literacy		

### Student Learning Targets/Objectives

Students will ....

- Explain the purpose of an operating system.
- Describe characteristics of modern operating systems.
- Describe desktop and network operating systems.
- Determine applications, environments, and minimum hardware that are compatible with an OS and the customers' needs.
- Describe upgrading an operating system.
- Perform an operating system installation.
- Identify hard drive setup procedures.
- Prepare a hard drive for the installation of an operating system.
- Perform an operating system installation using default settings,
- Create computer user accounts.
- Complete the operating system installation.
- Describe custom installation options.
- Identify the boot sequence and registry files.
- Explore common tools and utilities of the Windows GUI.
- Manipulate items on a desktop.
- Use Windows tools to install, navigate, and uninstall an application
- Identify and describe administrative tools
- Explain control panel utilities common to all Microsoft operating systems.
- Explain control panel utilities unique to Windows 7, unique to Vista, and unique to XP.
- Use Command Line tools to install an OS.

- Explain client-side virtualization.
- Describe the purpose and requirements of virtual machines
- Describe the resource requirements of virtual machines.
- Describe the emulator requirements of virtual machines.
- Describe the hypervisor of virtual machines.
- Identify and apply common preventive maintenance techniques for operating systems.
- Create a preventive maintenance plan.
- Create a task that is performed automatically according to a schedule.
- Create a backup of the hard drive.
- Troubleshoot operating systems.
- Apply the six steps of the troubleshooting process to operating systems.
- Identify common problems and solutions for operating systems.
- Explain the principles of networking.
- Describe types of networks.
- Describe basic networking concepts and technologies.
- Describe the physical components of a network.
- Describe LAN topologies.
- Identify Ethernet standards.
- Explain OSI and TCP/IP data models
- Describe how to configure a NIC and connect to a network
- Identify the names, purposes, and characteristics of other technologies used to establish connectivity to the Internet
- Identify and apply common preventive maintenance techniques used for networks
- Troubleshoot a networks.

## Assessments

- Pre and Formative: Daily —do now/warm-up responses. Ability to demonstrate proficiency in key unit concepts in class discussions. Student Portfolio of key work products. Shared responses to Essential Questions. Interim quizzes. Written and reading-based homework.
- Summative: End of unit written exam
- Authentic: Hands-on Lab:
  - Optional Lab: Install Windows Vista
  - Lab: Create Accounts and Check For Updates in Windows XP
  - Optional Lab: Create Accounts and Check For Updates in Windows Vista
  - Lab: Managing System Files with Built-in Utilities in Windows XP

- Optional Lab: Managing System Files with Built-in Utilities in Windows Vista
- Lab: Run Commands in Windows XP
- Optional Lab: Run Commands in Windows Vista
- Lab: Managing Administrative Settings and Snap-ins in Windows XP
- Optional Lab: Managing Administrative Settings and Snap-ins in Windows Vista
- Lab: Install Third-Party Software in Windows XP
- Optional Lab: Install Third-Party Software in Windows Vista
- Lab: Restore Points in Windows XP
- Lab: Restore Points in Windows Vista
- Lab: Registry Backup and Recovery in Windows XP
- Lab: Managing Device Drivers with Device Manager in Windows XP
- Optional Lab: Managing Device Drivers with Device Manager in Windows Vista

#### Teaching and Learning Actions

##### Instructional Strategies

Academic vocabulary and language; Accountable talk; Adapting to learning styles/multiple intelligences; Analysis of student work; Cues, questions, activating prior knowledge; Current events; Direct instruction; Discovery/Inquiry-based learning; Document-based questions; Effective questioning; Field experience, field trip, or field study; Flexible/strategic grouping; Formative assessment process; Guest speakers; Hands-on learning; Identifying similarities and differences; Integration of content areas; Lecture; Learning centers; Mastery learning; Modeling; Music and songs; Nonlinguistic representations; Note booking/journaling; Peer teaching/collaboration; Project-based learning; Realia; Reinforcing effort and providing recognition; Role play/simulations/drama; Student goal setting; Student self-assessment; Summarizing and note taking; Targeted feedback; Word wall

## MTSS

### Special education students::

- Adhere to all modifications and health concerns stated in each IEP.
- Give students a MENU options, allowing students to pick assignments from different levels based on difficulty.
- Use the NEWSELA software, which can revise the reading Lexile level to meet students at current reading level.
- Accommodating Instructional Strategies Reading Aloud, Graphic Organizers, Reading Study Guides, one-on-one instruction, class website (Google Classroom), Handouts, Definition List, Syllabus, Large Print, Outlines
- Utilize Snap-n-Read and Co-Writer

### English Language Learners (ELL) students:

- Use the Britannica launch pack software; give students the option to change the language of the article to the student's native language for most articles.
- Snap and Read Google extension addition. Will read to the student in the language selected.
- Vocabulary Spelling City word banks
- Use visuals whenever possible to support classroom instruction and classroom activities.
- Teacher modeling and written instructions for every assignment

### At risk of failure students:

- Give students a MENU options allowing students to pick activities based on interest that address the objectives and standards of the unit.
- Modified Instructional Strategies, Reading alouds, Graphic Organizers, Reading Study Guides, small learning group instruction, class website (Google Classroom), Syllabus, inclusion of more visuals and Films, Field Trips, Google Expeditions, Peer Support, one on one instruction
- Constant parental contact along with mandatory tutoring appointments.
- Academic Contracts

### Gifted and talented students:

- Modified instructional strategies Socratic Seminar, Group Discussion, Think-Pair-Share, Individual Assignments graded on a more rigorous rubric, Multimedia Projects, working with more primary source documents and completing Case Studies.
- Student led classroom instruction also Project Based Learning.

Students with a 504:

Adhere to all modifications and health concerns stated in 504 plan.  
Then assess the academics of the student to implement the necessary  
modifications as described in this document

**Chapter 5: Activities****What activities are associated with this chapter?****5.1.2.3 Worksheet - NOS Certifications and Jobs**

- Conduct Internet research to pre-screen online resources for use in completing the worksheet and create a list for students.
- Be prepared to provide struggling students with multiple examples of positions that require NOS certifications.

**5.1.4.4 Lab – Data Migration in Windows 7****5.1.4.5 Lab – Data Migration in Windows Vista****5.1.4.6 Lab – Data Migration in Windows XP**

- Lab is new to the curriculum.  
Make sure that students understand they will be transferring files to and from the same computer.

**5.2.1.5 Lab – Install Windows 7****5.2.1.6 Lab – Install Windows Vista****5.2.1.7 Lab – Install Windows XP**

- Be prepared to provide students with installation media— a USB flash drive or an installation DVD.
- The BIOS boot sequence should be set in accordance with the correct installation media.
- Provide students with any important information that they will need prior to completing the lab: Username and password, the product key, time zone, the computer's current location, etc.

**5.2.1.9 Lab – Check for updates in Windows 7****5.2.1.10 Lab – Check for updates in Windows Vista****5.2.1.11 Lab – Check for updates in Windows XP**

- Prior to checking for updates, the instructor should confirm that Windows was properly installed on all lab computers.

#### **5.2.2.3 Lab – Advanced Installation of Windows 7**

#### **5.2.2.4 Lab – Advanced Installation of Windows Vista**

#### **5.2.2.5 Lab – Advanced Installation of Windows XP**

- One 16GB partition on the hard drive needs to support Windows 7 (32-bit) or 20GB for Windows 7 (64-bit), Windows AIK, and install.wim.
- Students will also set up two other partitions (any size), and leave 1GB of unallocated hard drive space. Confirm there is enough disk space for each of the other partitions.
- Plan ahead to download Windows AIK. The download may require you to validate the OS. It is also over 1.7 GB in size. It should be downloaded prior to performing the lab

#### **5.2.3.4 Lab – Registry Backup and Recovery in Windows XP**

- Completion of the lab requires Windows XP.

#### **5.2.4.3 Lab – Create a Partition in Windows 7**

#### **5.2.4.4 Lab – Create a Partition in Windows Vista**

#### **5.2.4.5 Lab – Create a Partition in Windows XP**

- Confirm that students' computers have the unpartitioned space required for completing the lab.

#### **5.3.1.5 Lab – Task Manager (Managing Processes) in Windows 7**

#### **5.3.1.6 Lab – Task Manager (Managing Processes) in Windows Vista**

#### **5.3.1.7 Lab – Task Manager (Managing Processes) in Windows XP**

- Explain to students that they can complete the

lab using a browser other than Firefox.

#### **5.3.1.11 Lab – Install Third-Party Software in Windows 7**

#### **5.3.1.12 Lab – Install Third-Party Software in Windows Vista**

#### **5.3.1.13 Lab – Install Third-Party Software in Windows XP**

- Provide students with the link for the latest version of Packet Tracer.
- Explain to students that Packet Tracer will be used throughout later Chapters and that they should become familiar with the program. After they remove it, consider assigning the installment portion of the lab for homework and ask them to keep the program for later use.

#### **5.3.2.3 Lab – Create User Accounts in Windows 7**

#### **5.3.2.4 Lab – Create User Accounts in Windows Vista**

#### **5.3.2.5 Lab – Create User Accounts in Windows XP**

- Provide students with a username and password prior to performing the lab.

#### **5.3.2.7 Lab – Configure Browser Settings in Windows 7**

#### **5.3.2.8 Lab – Configure Browser Settings in Windows Vista**

#### **5.3.2.9 Lab – Configure Browser Settings in Windows XP**

- This lab contains configuration examples from Microsoft Internet Explorer version 9. You will need to make the changes necessary if you are using a different version or browser in your classroom. If you do not allow students to access the Internet directly, perform this lab as a demonstration for the class.

#### **5.3.2.16 Lab – Managing Virtual Memory Windows 7**

#### **5.3.2.17 Lab – Managing Virtual Memory Windows Vista**

#### **5.3.2.18 Lab – Managing Virtual Memory Windows XP**

- Confirm that students have set virtual memory for the two partitions used in the lab to be managed by the system.

#### **5.3.2.20 Lab – Managing Device Drivers with Device Manager in Windows 7**

#### **5.3.2.21 Lab – Managing Device Drivers with Device Manager in Windows Vista**

#### **5.3.2.22 Lab – Managing Device Drivers with Device Manager in Windows XP**

- The students will be accessing sensitive settings during this lab. Stress the importance of following instructions.
- Consider performing the lab as a demonstration, asking students to follow you step-by-step.

#### **5.3.2.24 Lab – Regional and Language Options in Windows 7**

#### **5.3.2.25 Lab – Regional and Language Options in Windows Vista**

#### **5.3.2.26 Lab – Regional and Language Options in Windows XP**

#### **5.3.3.5 Lab – Monitor and Manage System Resources in Windows 7**

#### **5.3.3.6 Lab – Monitor and Manage System Resources in Windows Vista**

#### **5.3.3.7 Lab – Monitor and Manage System Resources in Windows XP**

- Provide students with antivirus or antispyware software to download and install prior to performing the lab. Windows Defender will not work otherwise.

#### **5.3.4.2 Lab – Hard Drive Maintenance in Windows 7**

#### **5.3.4.3 Lab – Hard Drive Maintenance in Windows Vista**

#### **5.3.4.4 Lab – Hard Drive Maintenance in Windows XP**

- Review the purpose of CHKDSK with students prior to performing the lab.

#### **5.3.4.6 Lab – Managing System Files with Built-in Utilities in Windows 7**

#### **5.3.4.7 Lab – Managing System Files with Built-in Utilities in Windows Vista**

#### **5.3.4.8 Lab – Managing System Files with Built-in Utilities in Windows XP**

- The students will be accessing sensitive settings during this lab. Stress the importance of following instructions.
- Consider performing the lab as a demonstration, asking students to follow you step-by-step.

#### **5.3.5.2 Lab – Remote Desktop and Remote Assistance in Windows**

#### **5.3.5.3 Lab – Remote Desktop and Remote Assistance in Windows Vista**

#### **5.3.5.4 Lab – Remote Desktop and Remote Assistance in Windows XP**

- Confirm that computers are configured properly before beginning the lab. Instructions are included in the lab.

#### **5.3.7.2 Lab – Working with CLI Commands in Windows**

- Lab is new to the curriculum.
- Review the purpose of the CLI Commands on page 5.3.7.1 prior to performing the lab.

#### **5.3.7.4 Lab – Run Line Utilities in Windows 7**

#### **5.3.7.5 Lab – Run Line Utilities in Windows Vista**

#### **5.3.7.6 Lab – Run Line Utilities in Windows XP**

- The students will be accessing sensitive settings during this lab. Stress the importance of following instructions.
- Consider performing the lab as a demonstration, asking students to follow you step-by-step.

#### **5.4.1.4 Lab – Install Virtual PC**

- Prior to assigning the lab, perform the required downloads and test all software on lab computers to make sure that Windows XP Mode is supported and works properly.

#### **5.5.1.2 Lab – Managing the Startup Folder in Windows 7**

#### **5.5.1.3 Lab – Managing the Startup Folder in Windows Vista**

#### **5.5.1.4 Lab – Managing the Startup Folder in Windows XP**

- Ask students to confirm that they have removed FreeCell from the Startup Folder.

#### **5.5.1.7 Lab – Schedule a Task Using the GUI and the at command in Windows 7**

#### **5.5.1.8 Lab – Schedule a Task Using the GUI and the at command in Windows Vista**

#### **5.5.1.9 Lab – Schedule a Task Using the GUI and the at command in Windows XP**

- Ask students to create a list of other tasks that they would schedule using their personal computers.
- After completing this lab for the first time, consider assigning it for homework.

#### **5.5.1.11 Lab – Use the System Restore Tool in Windows 7**

#### **5.5.1.12 Lab – Use the System Restore Tool in Windows Vista**

#### **5.5.1.13 Lab – Use the System Restore Tool in Windows XP**

- Consider repeating this lab with students the next time that software needs to be downloaded for class use.

### **Chapter 6: Activities**

#### **6.3.2.7 Lab – Configure a NIC to use DHCP in Windows 7**

#### **6.3.2.8 Lab – Configure a NIC to use DHCP in Windows Vista**

#### **6.3.2.9 Lab – Configure a NIC to use DHCP in Windows XP**

- Students need to know the pathway to the “Internet Protocol Version 4 (TCP/IPv4) Properties” in all versions of Windows.
- Students should practice implementing both DHCP and Static IP address assignment often.

#### **6.3.2.10 Packet Tracer – Adding Computers to an Existing Network**

- Introduce Packet Tracer and its features to students prior to completing this activity.
- Depending on your students, direct instruction may be needed the first time students complete this lab.
- Packet Tracer provides a wonderful classroom tool but it is not a replacement for working with the actual equipment.

#### **6.3.3.4 Worksheet – Protocol Definitions and Default Ports**

- Port numbers need to be committed to memory.
- Students should be given multiple opportunities to review the port numbers throughout the remainder of the course.

#### **6.4.2.4 Lab – Building Straight-Through and Crossover UTP Cables**

- Students will need ample time to complete this lab.
- Have students work in partners if connector supply is an issue.
- Always have students verify their work before crimping the connector.

#### **6.4.2.5 Packet Tracer – Cabling a Simple Network**

- After completing this activity, have students duplicate the instructions with real equipment.

#### **6.5.1.2 Packet Tracer – Physical Topologies**

- After completing this activity, have students build different physical topologies with actual equipment if possible.

#### **6.8.2.2 Worksheet – Internet Search for NIC Drivers**

- If students are installing a different wireless NIC in the following labs, have them search and detail the driver for their actual hardware.

#### **6.8.2.4 Lab – Install a Wireless NIC in Windows 7**

#### **6.8.2.5 Lab – Install a Wireless NIC in Windows Vista**

#### **6.8.2.6 Lab – Install a Wireless NIC in Windows XP**

**Revisit lab safety rules prior to installing hardware.**

#### **6.8.2.9 Packet Tracer – Install a Wireless NIC**

#### **6.8.3.5 Lab – Connect to a Router for the First Time**

- This lab is written for Windows 7. If using another version of Windows, provide students with modified instructions.
- Instruct students on resetting defaults to the router after completing a lab activity and

emphasis the importance of this step.

#### **6.8.3.6 Packet Tracer Connect to a Wireless Router and Configure Basic Settings**

- Completing this Packet Tracer will prepare students for the upcoming hands-on labs.
- Students should be proficient at implementing a small wireless network; therefore, ample practice time should be given in both Packet Tracer and lab settings.
- In all Packet Tracer labs, the Linksys WRT300n is used for configurations as a substitute for the Linksys E2500 Wireless Router.

#### **6.8.3.8 Lab – Configure Wireless Router In Windows 7**

#### **6.8.3.9 Lab – Configure Wireless Router In Windows Vista**

#### **6.8.3.10 Lab – Configure Wireless Router In Windows XP**

- This lab is written for Linksys E2500 Wireless Router, which is new to this course.
- In order to gain more practice with equipment, students can complete earlier version of this lab designed for the Linksys WRT300N after completing the new lab.

#### **6.8.3.11 Packet Tracer – Connecting Wireless PCs to a Linksys WRT300N**

This lab requires students to use the Linksys software to connect to the wireless router. Students may be unfamiliar with this interface and need assistance on Packet Tracer.

#### **6.8.3.14 Lab - Test the Wireless NIC in Windows 7**

**6.8.3.15 Lab - Test the Wireless NIC in Windows Vista**

**6.8.3.16 Lab - Test the Wireless NIC in Windows XP**

- Prior to completing this lab, review the following tools and concepts: loopback, ipconfig, ping, tracert, and lookup

**6.8.3.17 Packet Tracer – Test a Wireless Connection**

- Lab provides extra practice with tools utilized in the Test the Wireless NIC hands on labs.

**6.8.4.7 Lab – Share a Folder, Create a Homegroup and Map a Network Drive in Windows 7**

**6.8.4.8 Lab – Share a Folder and Map a Network Drive in Windows Vista**

**6.8.4.9 Lab – Share a Folder and Map a Network Drive in Windows XP**

- For all sharing labs, implement before teaching. Be aware of account permissions when attempting this lab.

**6.9.1.6 Worksheet – Answer Broadband Questions**

**6.9.1.8 Worksheet – ISP Connection Types**

- Prior to completing this worksheet, have students brainstorm and list the internet access options in your location.

**Chapter 6 Quiz**

D

Experiences

Field Trips  
Guest Speakers  
Internships  
Job Shadowing

## Resources

- [WWW.Cisco.netacad.net](http://WWW.Cisco.netacad.net)
- IT Essentials Course Booklet, Version 5 By Cisco Networking Academy Published Mar 25, 2013 by Cisco Press.
- IT Essentials Lab Manual, 5th Edition By Cisco Networking Academy Published Mar 19, 2013 by Cisco Press.
- IT Essentials, 5th Edition
- By Cisco Networking Academy
- Published Jul 16, 2013 by Cisco Press. Part of the Companion Guide series. Copyright 2014

## Lab PC Repair Tools

The computer toolkit should include the following tools:

- Phillips screwdriver
- Flathead screwdriver
- Hex socket drivers (various sizes)
- Needle-nose pliers
- 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 (optional)
- Compressed air service canister (optional due to varying classroom health and safety laws)
- Power supply tester (optional)
- Wire cutters
- Crimpers (RJ-45)
- Cable strippers
- Cable testers
- Network loopback plugs (optional)

## Additional Required Lab Equipment

- The ITE lab topologies require the following equipment and accessories:
- 1 Internet connection for Internet searches and driver downloads (this could be the instructor's workstation)
- 1 printer or integrated printer/scanner/copier for the class to share

Suggested Time Frame:

10 Weeks

D- Indicates differentiation at the Lesson Level.

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Computer TIA A+

































































































































































































































































































































































































































































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D- Indicates differentiation at the Lesson Level.

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D- Indicates differentiation at the Lesson Level.

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