

# Technology Devices Maintenance

## APPLY PROBLEM-SOLVING AND CRITICAL THINKING TO MAINTAINING TECHNOLOGY DEVICES 1.0

- 1.1 Assess the technology environment (e.g., software, devices, operating systems, and device compatibility) 1.1

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- 1.2 Identify common project management concepts and limitations (e.g., project management triangle, goals, Gantt charts, and user needs) 1.2

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- 1.3 Determine priorities in establishing and maintaining computers/electronic devices (i.e., user needs, workflow, data security, etc.) 1.3

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- 1.4 Apply problem-solving processes to computers and electronic devices (i.e., define problem, identify cause, research problem, select and test solution, prevent the problem, etc.) 1.4

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- 1.5 Document the results and update the problem-solving process 1.5

## MAINTAIN A SAFE AND ENVIRONMENTALLY CONSCIOUS TECHNOLOGY WORKPLACE 2.0

- 2.1 Identify and apply personal responsibility for a safe and healthy environment (i.e., conforming to industry standards, recycling protocols for toxic/non-toxic materials, avoid/eliminate electrical hazards, etc.) 2.1

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- 2.2 Use job-specific tools, materials, and equipment used to maintain technology 2.2

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- 2.3 Identify ergonomics and repetitive strain injuries experienced in technology maintenance occupations 2.3

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- 2.4 Explain various safety measures and procedures including electrostatic discharge and how inadequate measures can damage equipment 2.4

## ADDRESS SECURITY ISSUES RELATED TO TECHNOLOGY DEVICES 3.0

- 3.1 Identify security issues related to the technology environment (i.e., computer hardware and software, data, mobile devices, networks, etc.) 3.1

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- 3.2 Identify and apply or create and update policies to maintain data integrity and security 3.2

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- 3.3 Explain the importance of physical security of computer hardware and electronic devices 3.3

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- 3.5 Identify methods to protect and prevent security threats 3.5

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**3.4** Explain user-related threats (i.e., ransomware, phishing, viruses, email attachments, social engineering, spoofing, identify theft, spamming, etc.) **3.5**  
Identify methods to protect and prevent security threats **3.4**

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**3.6** Explain external threats (i.e., denial of service, hacking/cracking, intrusion, etc.) **3.6**

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**EXPLORE LEGAL AND ETHICAL ISSUES RELATED TO INFORMATION TECHNOLOGY** **4.0**

**4.1** Identify issues specific to intellectual property rights including copyright, software licensing, patents, software piracy, and software duplication **4.1**

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**4.2** Identify issues and trends affecting data and information privacy **4.2**

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**4.3** Differentiate between ethical and unethical uses of technology (i.e., black hat/white hat hacking, industry-specific restrictions, etc.) **4.3**

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**4.4** Identify workplace issues created by improper use of technology (i.e., cyberbullying, discrimination, social posts, trolling, privacy, etc.) **4.4**

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**EXPLORE RAMIFICATIONS OF TECHNOLOGY DEVELOPMENT** **5.0**

**5.1** Explore challenges regarding the evolution of technology and their impact on our lives (i.e., automation, shift in occupations, data compatibility, security, privacy, consumer history, etc.) **5.1**

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**5.2** Explore future trends in technology with positive and negative implications **5.2**

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**5.3** Explore methods for keeping up with technology changes (i.e., forums, newsletters, Google alerts, technology announcements, etc.) **5.3**

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**INSTALL, CONFIGURE, UPGRADE, AND MAINTAIN TECHNOLOGY**

**6.1** Identify the purpose and characteristics of common system components (i.e., storage devices, power supply, removable media, expansion cards, memory, etc.) **6.1**

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**6.2** Identify the purpose and characteristics of mobile device components (i.e., power supply, removable media, screens, batteries, speakers, ports, etc.) **6.2**

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**6.3** Demonstrate basic procedures for adding and removing common system components and recognizing associated cable connections **6.3**

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**6.4** Distinguish the names, purposes, and performance characteristics of common peripheral ports **6.4**

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**6.5** Demonstrate proper procedures for installing and configuring common peripheral devices **6.5**

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**6.6** Identify issues that must be considered when upgrading technology components [i.e., safety (electrical), data integrity, compatibility, user privacy, etc.] **6.6**

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**6.7** Follow procedures for preventive maintenance of computers and peripherals (i.e., physical cleaning, defragmenting drives, data backup, security updates, etc.) 6.7

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**6.8** Determine the cost-benefit of replacement or repair of hardware/software 6.8

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**ASSESS  
MOTHERBOARDS,  
PROCESSORS, AND  
MEMORY**

**7.1** Identify CPU chip types, manufacturers, and associated sockets 7.1

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**7.2** Distinguish differences between surface mount technology (SMT) and socketed components 7.2

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**7.3** Identify operational characteristics of RAM (e.g., speed, type, and size) 7.3

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**7.4** Identify the responsibility of the various components of the motherboard (i.e., integrated ports, expansion slots, chipsets, battery, etc.) 7.4

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**7.5** Identify basic compatibility guidelines of the motherboard, processors, and memory 7.5

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**7.6** Explain the role of BIOS and CMOS in computer technology 7.6

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**7.7** Explain how environmental factors including heat, airborne particulates, humidity, vibration, and shocks can affect equipment 7.7

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**7.8** Explain the relationship of hertz to processor and bus speeds 7.8

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**7.9** Explain the relationship of bits and bytes to common memory and storage capacities 7.9

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**7.10** Apply basic electronics theories (i.e., Ohm's Law, calculation of wattage, voltage, amperage, resistance, capacitance, etc.) 7.10

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**INSTALL AND MAINTAIN  
PRINTERS AND  
SCANNERS**

**8.1** Compare and contrast printer technologies including laser, ink dispersion, solid ink, thermal, impact, and dye sublimation 8.1

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**8.2** Explore connection options for each printer and scanner technology (i.e., wired vs wireless, server interface, cable types, local infrastructures, etc.) 8.2

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**8.3** Determine options to upgrade printers (i.e., memory, hard drives, NICS, FAX, etc.) 8.3

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**8.4** Troubleshoot common printer problems (i.e., paper jam, connectivity, consumables, power, security protocols, etc.) 8.4

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**EXPLAIN BASIC  
NETWORKING  
HARDWARE**

**9.1** Differentiate common types of network cables, topologies, and their characteristics 9.1

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**9.2** Install and configure network cards and adapters 9.2

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**9.3 Differentiate common technologies available for establishing network connectivity (i.e., routers, wireless, hubs, modem, switches, repeaters, mesh networks, etc.)** 9.3

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**9.4 Diagnose simple hardware problems in networking equipment (i.e., interpret error codes/messages, etc.)** 9.4

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**COMPARE THE BASICS OF COMMON OPERATING SYSTEMS**

**10.1 Differentiate the characteristics of common device operating systems (i.e., Windows, IOS, Android, Linux, MAC, etc.)** 10.1

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**10.2 Distinguish major software features and functions by device (i.e., taskbar, menus, notification bars, gestures, etc.)** 10.2

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**10.3 Navigate major operating system management tools (i.e., file management, administrative tools, command line, REGEDIT, Task Manager, system utilities, etc.)** 10.3

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**10.4 Explain command-line functions and utilities to manage the operating system including the proper syntax and switches (i.e., file attributes, commands for creating, viewing, and managing drives, directories, files, etc.)** 10.4

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**10.5 Identify common data redundancy options (i.e., network attached storage, RAID, cloud storage, etc.)** 10.5

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**INSTALL, CONFIGURE, AND UPDATE OPERATING SYSTEMS**

**11.1 Compare and contrast the differences between native and virtualized operating system environments** 11.1

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**11.2 Install operating systems using default and customized installation options** 11.2

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**11.3 Backup and restore user data (i.e., copy/paste, images, clones, etc.)** 11.3

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**11.4 Identify common symptoms and resolve problems encountered during installations and version upgrades** 11.4

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**11.5 Perform operating system updates** 11.5

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**11.6 Set up basic system boot sequences and boot methods including recovery options** 11.6

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**11.7 Install and add a device by installing and configuring device drivers and required software** 11.7

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**11.8 Optimize the operating system (i.e., deleting temporary files, user needs, custom startup settings, built-in optimization tools, etc.)** 11.8

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**11.9 Perform cross-platform migration retaining user data and settings (i.e., computers, tablets, smartphones, etc.)** 11.9

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**11.10** Interpret the meaning of common error codes and startup messages from the boot sequence and identify steps to correct problems [11.10](#)

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**11.11** Apply common diagnostic utilities and tools [11.11](#)

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**TROUBLESHOOT A NETWORK**

**12.1** Assess the networking capabilities of common operating systems (i.e., domain, workgroup, etc.) [12.1](#)

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**12.2** Determine best protocols and encryption levels (i.e., TCP/IP, NetBIOS, wireless encryption, etc.) [12.2](#)

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**12.3** Use network troubleshooting applications (i.e., IPCONFIG, PING, TRACERT, NSLOOKUP, DIG, NETSTAT, NBTSTAT, ARP, etc.) [12.3](#)

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**12.4** Define basic internet protocols and terminologies (i.e., HTTP, HTTPS, FTP, SMTP, DNS, DHCP, POP, etc.) [12.4](#)

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**12.5** Identify infrastructure and procedures for establishing internet connectivity

**12.6** Configure software/hardware firewall protection [12.5](#)

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