



TECHNOLOGY DEVICES MAINTENANCE

15.1202.00

TECHNICAL STANDARDS

An Industry Technical Standards Validation Committee developed and validated these standards on April 29, 2025. The Arizona Career and Technical Education Quality Commission, the validating authority for the Arizona Skills Standards Assessment System, reviewed these standards on July 13, 2025.

Note: Arizona's Professional Skills are taught as an integral part of the Technology Devices Maintenance program.

**The Technical Skills Assessment for Technology Devices Maintenance is available
SY2025-2026.**

Note: In this document i.e. explains or clarifies the content and e.g. provides examples of the content that must be taught.

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

- 1.1 Assess the technology environment or electronic surroundings in a small or large working group or organization, including IT systems, network configurations, and storage methods
- 1.2 Explain technology assessment (e.g., process used to determine strengths, weaknesses, and potential risks, and aligning technology with personal or business goals)
- 1.3 Communicate with clients to establish and maintain computers/electronic devices (e.g., hardware needs and maintenance, software needs and updates, and security needs and updates)
- 1.4 Apply problem-solving skills to solve problems with computers/electronic devices (i.e., reproduce the problem, define the problem, identify the cause, research the solution, select and test a solution, verify the results, etc.)
- 1.5 Document the results and update the problem-solving process as needed (i.e., ticketing systems, notations, communications, troubleshooting, etc.)

STANDARD 2.0 MAINTAIN A SAFE AND ENVIRONMENTALLY CONSCIOUS TECHNOLOGY WORKPLACE

- 2.1 Take personal responsibility for a safe and healthy work environment (i.e., conform to industry standards, recycle toxic/non-toxic materials, avoid/eliminate electrical hazards, etc.)
- 2.2 Use the appropriate tools, materials, and equipment to establish and maintain technology
- 2.3 Identify ergonomics and repetitive strain injuries experienced in technology maintenance occupations
- 2.4 Explain safety measures and procedures including electrostatic discharge and explain how inadequate measures can damage equipment (i.e., proper handling/disposing of lithium batteries, using proper lifting of heavy objects, etc.)

STANDARD 3.0 ADDRESS SECURITY ISSUES RELATED TO TECHNOLOGY DEVICES

- 3.1 Identify and apply security policies to maintain data integrity and security (i.e., computer lock out time, minimum password requirements, data encryption, etc.)
- 3.2 Explain the importance of physical security of computer hardware and electronic devices (i.e., biometrics, mantraps, 2-factor authentication, locked server rooms, etc.)
- 3.3 Explain user-related threats (i.e., ransomware, phishing, malware, etc.) and delivery mechanisms (i.e., email attachments, social engineering, spoofing, identify theft, spamming, malicious extensions, etc.)
- 3.4 Identify methods to protect and prevent security threats [i.e., signature based, sandboxing, behavior-based and automated behavioral analysis (ABA), human review, user instructions/training, etc.]
- 3.5 Explain external threats (i.e., denial of service, hacking/cracking, IDS/IPS, etc.)

STANDARD 4.0 EXPLORE LEGAL AND ETHICAL ISSUES RELATED TO INFORMATION TECHNOLOGY

- 4.1 Identify issues specific to intellectual property rights including copyright, software licensing, patents, and software piracy
- 4.2 Identify issues and trends affecting data and information privacy [e.g., Cybersecurity Maturity Model Certification (CMMC), Health Insurance Portability and Accountability Act (HIPAA), and Family Education Rights and Privacy Act (FERPA)]
- 4.3 Differentiate between ethical and unethical uses of technology [i.e., black hat/white hat hacking, industry-specific restrictions, responsible disclosure, Acceptable Use Policy (AUP), abuse of access, etc.]

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STANDARD 5.0 EXPLORE RAMIFICATIONS OF TECHNOLOGY DEVELOPMENT

- 5.1 Explore future trends in technology with positive and negative implications
- 5.2 Explore challenges regarding the evolution of technology and their impact on our lives (i.e., AI, immutable backups, automation, shift in occupations, data compatibility, security, privacy, consumer history, etc.)
- 5.3 Explore methods for keeping up with technology changes (i.e., forums, digital newsletters, trade mailing lists, technology announcements, certifications, continuing education, etc.)

STANDARD 6.0 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.)
- 6.2 Identify the purpose and characteristics of mobile device components (i.e., power supply, removable media, screens, batteries, speakers, ports, etc.)
- 6.3 Identify issues to be considered when upgrading technology components [i.e., safety (electrical), data integrity, compatibility, user privacy, power efficiency, etc.]
- 6.4 Demonstrate basic procedures for adding and removing common system components and recognizing associated cable connections (i.e., compatibility and serialization, architecture, etc.)
- 6.5 Distinguish the names, purposes, and performance characteristics of common peripheral ports
- 6.6 Demonstrate proper procedures for installing and configuring common peripheral devices
- 6.7 Follow procedures for preventive maintenance of computers and peripherals (i.e., physical cleaning, S.M.A.R.T. goals, data backup, security updates, etc.)
- 6.8 Determine the cost-benefit of repair or replacement of hardware/software

STANDARD 7.0 ASSESS INFORMATION SYSTEM COMPONENTS AND HARDWARE

- 7.1 Identify CPU chip types, architecture, manufacturers, water and air cooling, and associated sockets
- 7.2 Identify operational characteristics of RAM (e.g., speed, type, and size)
- 7.3 Identify the responsibility of the various components of the motherboard (i.e., integrated ports, expansion slots, chipsets, battery, etc.)
- 7.4 Identify basic compatibility guidelines of the motherboard, processors, and memory
- 7.5 Explain the role of BIOS/UEFI and CMOS in computer technology
- 7.6 Explain how environmental factors including heat, airborne particulates, humidity, vibration, and shocks can affect equipment
- 7.7 Explain the relationship of clock speeds and bus speeds and width (i.e., megahertz, gigahertz, etc.)
- 7.8 Explain the relationship of bits and bytes to common memory and storage capacities
- 7.9 Explain basic Ohm's law theory and common electrical terms (i.e., voltage, amperage, resistance, capacitance, etc.)
- 7.10 Identify power supply characteristics (e.g., wattage calculation, draw, efficiency ratings, and connectors)

STANDARD 8.0 INSTALL AND MAINTAIN PRINTERS AND SCANNERS

- 8.1 Compare and contrast printer technologies (e.g., laser, ink, 3D, thermal, and impact)
- 8.2 Explore connection options for printer and scanner technology (i.e., wired vs. wireless, cable types, local infrastructures, etc.)
- 8.3 Troubleshoot common printer problems (i.e., paper jam, connectivity, consumables, maintenance cycle, power, security protocols, etc.)

STANDARD 9.0 EXPLAIN BASIC NETWORKING

- 9.1 Differentiate common types of network cables, media and their characteristics (i.e., wire categories, copper versus fiber, wireless and wired, WIFI generations, WIFI frequency and channels, etc.)
- 9.2 Install and configure network cards and adapters
- 9.3 Differentiate common technologies available for establishing network connectivity (i.e., routers, wireless, modem, switches, repeaters, mesh networks, etc.)
- 9.4 Explain the different Open Systems Interconnection (OSI) model layers
- 9.5 Explain the different network authentication terms (i.e., WPA, RADIUS, SSID, SSL, passphrase, etc.)

STANDARD 10.0 COMPARE THE BASICS OF COMMON OPERATING SYSTEMS

- 10.1 Differentiate the characteristics, features, and applications of different operating systems (i.e., Windows, iOS, Android, Linux, MacOS, etc.)
- 10.2 Navigate major software functions by operating system (i.e., taskbar, menus, notification bars, hot keys, gestures, etc.)

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- 10.3 Use major operating system management tools (i.e., file management, administrative tools, command line, REGEDIT, Task Manager, system utilities, etc.)
- 10.4 Explain command-line functions and utilities used to manage the operating system including the proper syntax and switches (i.e., scripts, PowerShell, file attributes, commands for creating, viewing, and managing drives, directories, files, etc.)

STANDARD 11.0 INSTALL, CONFIGURE, AND UPDATE OPERATING SYSTEMS

- 11.1 Compare and contrast the differences between native and virtualized operating system environments
- 11.2 Install operating systems using default and customized installation options (i.e., PXE, answer file, attended vs. unattended installations, etc.)
- 11.3 Configure backups and restore data (i.e., network attached storage, software RAID, cloud storage, ZFS, File History, Window Server Backup, Time Machine, images, clones, 3-2-1 rule, etc.)
- 11.4 Identify common issues and resolutions encountered during installations and version upgrades (i.e., upgrade paths, procedures, etc.)
- 11.5 Perform operating system security and feature updates
- 11.6 Set up basic system boot sequences and boot methods including recovery options (i.e., boot order, secure boot, etc.)
- 11.7 Install and update device drivers
- 11.8 Optimize the operating system (i.e., deleting temporary files, custom startup settings, built-in optimization tools, uninstall unnecessary applications and services, etc.)
- 11.9 Explain the cross-platform migration process and limitations (i.e., computers, tablets, smartphones, etc.)

STANDARD 12.0 APPLY NETWORK TROUBLESHOOTING

- 12.1 Diagnose infrastructure issues and procedures for establishing internet connectivity (i.e., hardware problems, network equipment, etc.)
- 12.2 Identify relevant protocols (i.e., HTTP, HTTPS, FTP, SMTP, DNS, DHCP, POP, etc.)
- 12.3 Use network troubleshooting applications (i.e., IPCONFIG, PING, TRACERT, NSLOOKUP, DIG, NETSTAT, NBTSTAT, ARP, etc.)
- 12.4 Verify resolution of issue and implement preventative measures