

# 2023-24 Competitive Events Guidelines

## Computer Problem Solving



Computer Problem Solving provides members with the opportunity to demonstrate knowledge about operating systems, networks and hardware. This competitive event consists of an objective test. This event aims to inspire members to learn about computer problem solving.

### Event Overview

**Division:** High School

**Event Type:** Individual

**Event Category:** Objective Test, 100-multiple choice questions (breakdown of question by competencies below)

**Objective Test Time:** 50 minutes

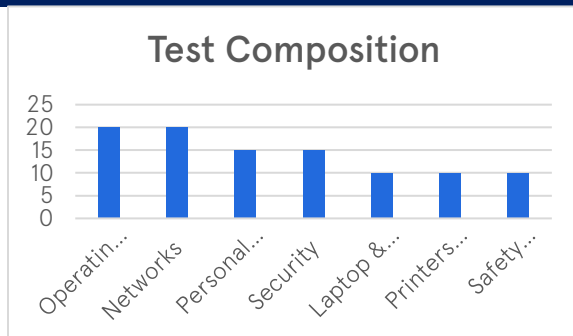
**NACE Connections:** Career & Self-Development

**Equipment Competitor Must Provide:** Pencil

**Equipment FBLA Provides:** One piece of scratch paper per competitor

### Objective Test Competencies

- Operating systems
- Networks
- Personal computer components
- Security
- Safety and environmental issues
- Laptop and portable devices
- Printers and scanners



### District/Region/Section

Check with your District/Region/Section leadership for District/Region/Section-specific competition information.

### State

Check with your State Leader for state-specific competition information.

### National

#### Policy and Procedures Manual

- Competitors should be familiar with the Competitive Events Policy & Procedures Manual, found on the Competitive Events page on [www.fbla.org](http://www.fbla.org).

#### Eligibility

- FBLA membership dues are paid by 11:59 pm Eastern Time on March 1 of the current program year.
- Members may compete in an event at the National Leadership Conference (NLC) more than once if they have not previously placed in the top 10 of that event at the NLC. If a member places in the top 10 of an event at the NLC, they are no longer eligible to compete in that event.

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- Members must be registered for the NLC and pay the national conference registration fee in order to participate in competitive events.
- Members must stay in an official FBLA hotel to be eligible to compete.
- Each state may submit four entries per event.
- Each member can only compete in one individual/team event and one chapter event (American Enterprise Project, Community Service Project, Local Chapter Annual Business Report, Partnership with Business Project).
- Picture identification (physical or digital driver's license, passport, state-issued identification, or school-issued identification) is required when checking in for competitive events.
- If competitors are late for an objective test, they will be allowed to compete until such time that results are finalized, or the accommodation would impact the fairness and integrity of the event. Competitive event schedules cannot be changed. Competitive events start in the morning before the Opening Session of the NLC.

### *Recognition*

- The number of competitors will determine the number of winners. The maximum number of winners for each competitive event is 10.

### *Event Administration*

- This event is an objective test administered online at the NLC.
- No reference or study materials may be brought to the testing site.
- No calculators may be brought into the testing site; online calculators will be provided through the testing software.

### *Tie Breaker*

- Ties are broken by comparing the correct number of answers to 10 pre-determined questions on the test. If a tie remains, answers to 20 pre-determined questions on the test will be reviewed to determine the winner. If a tie remains, the competitor who completed the test in a shorter amount of time will place higher.

### *Americans with Disabilities Act (ADA)*

- FBLA meets the criteria specified in the Americans with Disabilities Act for all competitors with accommodations submitted through the conference registration system by the registration deadline.

### *Penalty Points*

- Competitors may be disqualified if they violate the Competitive Event Guidelines or the Honor Code.
- Five points are deducted if competitors do not follow the Dress Code or are late to the testing site.

### *Electronic Devices*

- All electronic devices such as cell phones and smart watches must be turned off before competition begins.

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### Study Guide: Competencies and Tasks

#### A. Operating Systems

1. Compare and contrast the functionality of various operating systems.
2. Explain what an operating system is, describe its purpose, and site examples of different operating systems including DOS, Windows, and Macintosh.
3. Identify the fundamentals of using operating systems (e.g., Mac, Windows, and Linux) and describe operating system revision levels including GUI system requirements, application, and hardware compatibility.
4. Identify names, purposes, and characteristics of the primary operating system components including registry virtual memory and file system.
5. Install, configure, optimize, and upgrade operating systems using appropriate procedures and utilities.
6. Describe features of operating system interfaces.
7. Use command-line functions and utilities to manage operating systems, including proper syntax.
8. Identify concepts and procedures for creating, viewing, and managing disks, directories, and files on operating systems.
9. Demonstrate proficiency with file management and structure (e.g., folder creation, format, file creation, backup, copy, rename, delete, move, open, and save).
10. Demonstrate file management skills and perform basic software configuration operations (e.g., install new software, compress and expand files as needed, and download files as appropriate).
11. Identify the names, locations, purposes, and characteristics of operating system files.
12. Demonstrate the ability to recover operating systems (e.g., boot methods, recovery console, ASR, and ERD).
13. Recognize and resolve common operational problems, such as blue screen, system lock-up, input/output device, and application install.
14. Recognize, explain, and resolve common error messages and codes.
15. Identify the names, locations, purposes, and characteristics of operating system utilities.
16. Use disk management tools (e.g., DEFAG, NTBACKUP, CHKDSK, and format), system management tools (e.g., device and task manager and MSCONFIG>EXE) and file management tools (e.g., Windows Explorer and ATTRIB.EXE) to enhance optimization of operating system.
17. Demonstrate the ability to perform preventive maintenance on operating systems including software and Windows updates (e.g., service packs), scheduled backups/restore, and restore points.
18. Document computer system malfunction and software malfunction.

#### B. Networks

1. Define networking and describe the purpose, benefits, and risks of a network.
2. Identify the types (e.g., LAN, WAN, and MAN), features, advantages, and disadvantages of different networks.

3. Identify names, purposes, and characteristics of basic network protocols and terminologies.
  4. Identify names, purposes, and characteristics of technologies for establishing connectivity.
  5. Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, and network boards).
  6. Understand the differences between various network environments (e.g., peer-to-peer, client-server, thin client, n-tier, internetworks, intranets, and extranets).
  7. Analyze the advantages and the disadvantages of the client/server model.
  8. Identify and analyze the seven layers at which decisions must be made according to the OSI standard.
  9. Install, configure, optimize, and upgrade networks.
  10. Describe standard topologies, such as bus, star, ring, and broadband.
  11. Demonstrate knowledge of IP addressing schemes.
  12. Identify the types of wireless network media and the uses, advantages, and disadvantages of each.
  13. Install, identify, and obtain wired and wireless connection.
  14. Identify tools, diagnostic procedures, and troubleshooting techniques for basic network issues.
  15. Configure protocols such as TCP/IP (e.g., gateway, subnet mask, DNS, WINS, and static and automatic address assignment) and IPX/SPX (e.g., NWLink).
  16. Perform preventive maintenance of networks including securing and protecting network cabling.
  17. Install and configure e-mail applications.
  18. Differentiate areas of responsibilities between the telecommunications providers' responsibilities and their clients' responsibilities.
- C. Personal Computer Components
1. Identify how hardware components interact and work with software to perform computing tasks.
  2. Install, configure, optimize, and upgrade personal computer components.
  3. Identify tools, diagnostic procedures, and troubleshooting techniques for computer components.
  4. Describe the characteristics and functions of CPUs, motherboards, random access memory (RAM), expansion connections, hard drives, and CD-ROM drives.
  5. Explain the functions and characteristics of system expansion devices (e.g., graphics cards, sound cards, and modems).
  6. Recognize and isolate issues with peripherals, multimedia, specialty input devices, internal and external storage, memory utilization, and CPUs.
  7. Identify the steps used to troubleshoot components (e.g., installation, appropriate components, error codes, connections, compatibility, functionality, settings, and drivers).
  8. Identify and apply common preventative maintenance techniques for personal computer components.

9. Identify issues that must be considered when purchasing or upgrading a computer.
  10. Demonstrate the use of connectivity devices and peripheral equipment (e.g., portable storage devices, printers, cable modem, and wireless technologies).
  11. Identify the various types of computer storage devices and compare the advantages and disadvantages of certain storage devices.
  12. Identify and demonstrate resolutions to simple hardware and software problems as they occur (e.g., frozen screen, disk error, and printing problems).
- D. Security
1. Identify the purposes and characteristics of access control and permissions, auditing, and event logging.
  2. Identify names, purposes, and characteristics of hardware and software security issues including wireless, data and physical security.
  3. Define the various virus types and describe the common symptoms caused by viruses and their potential effects.
  4. Implement virus protection and removal procedures for a stand-alone computer or a network.
  5. Describe importance and process of incidence reporting.
  6. Install, configure, upgrade, and optimize software, wireless, and data security.
  7. Recognize social engineering and address social engineering situations.
  8. Implement security preventive maintenance techniques such as installing service packs and patches and training users about malicious software prevention technologies.
  9. Define concepts such as phishing, viruses, e-mail attachments, social engineering, spoofing, identity theft, and spamming.
  10. Explain concepts such as denial of service, hacking/cracking, intrusion, and intellectual property.
  11. Implement procedures used to recover information from failures and security breaches (e.g., malware and viral infection).
  12. Assess security threats and develop plan to address.
- E. Laptop and Portable Devices
1. Identify names, purposes, and characteristics of laptop-specific devices.
  2. Identify and distinguish between mobile and desktop motherboards and processors including throttling, power management, and Wi-Fi.
  3. Identify appropriate applications for laptop-specific communications such as Bluetooth, infrared, cellular Wan, and Ethernet.
  4. Identify appropriate laptop-specific power and electrical input devices and determine how amperage and voltage can affect performance.
  5. Identify the major components of the LCD including inverter, screen, and video card.
  6. Install, configure, optimize, and upgrade laptops and portable devices.
  7. Remove laptop-specific hardware such as peripherals, hot-swappable, and non-hot swappable devices.
  8. Describe how video sharing affects memory upgrades.
  9. Use tools, diagnostic procedures, and troubleshooting techniques for laptops and portable devices.

10. Identify and apply common preventive maintenance techniques for laptops and portable devices, cooling devices, hardware and video, cleaning materials, operating environments including temperature and air quality, storage, transportation and shipping.
- F. Printers and Scanners
1. Identify differences between types of printers and scanners including laser, ink dispersion, thermal, solid ink, impact printers, and scanners.
  2. Identify names, purposes, and characteristics of printer and scanner components (e.g., memory, driver, and firmware) and consumables (e.g., toner, ink cartridge, and paper).
  3. Identify the names, purposes, and characteristics of interfaces used by printers and scanners including port and cable types.
  4. Install and configure printers/scanners.
  5. Install and configure printer upgrades including memory and firmware.
  6. Optimize scanner performance including resolution, file format, and default settings.
  7. Optimize printer performance for example, printer settings such as tray switching, print spool settings, device calibration, media types, and paper orientation.
  8. Isolate and resolve identified printer/scanner problems including defining the cause, applying the fix, and verifying functionality.
  9. Identify appropriate tools used for troubleshooting and repairing printer/scanner problems.
  10. Perform scheduled maintenance according to vendor guidelines (e.g., install maintenance kits and reset page counts).
  11. Use recommended supplies and a suitable environment.
- G. Safety and Environmental Issues
1. Explain how information technology affects the natural environment (e.g., disposal of equipment, energy use, and use of natural resources).
  2. Identify potential hazards and implement proper safety procedures including ESD precautions and procedures, safe work environment, and equipment handling.
  3. Identify potential hazards and proper safety procedures including power supply, display devices, and environment (e.g., trip, liquid, situational, atmospheric hazards, and high-voltage and moving equipment).
  4. Identify proper disposal procedures for batteries, display devices, chemical solvents, and cans.
  5. Describe methods to handle environmental and human (e.g., electrical, chemical, and physical) accidents including incident reporting.
  6. Determine safe working practices to avoid or eliminate electrical hazards.
  7. Use Material Safety Data Sheets (MSDS) or equivalent documentation.
  8. Use appropriate repair tools.
  9. Describe ergonomic issues related to input technologies and demonstrate proper safety techniques.