

FBLA: NETWORKING CONCEPTS

Competency: General Network Terminology and Concepts	
Tasks	
1.	Demonstrate knowledge of the purposes, benefits, and risks for installing a network.
2.	Identify types of networks (e.g., LAN, WAN, MAN) and their features and applications.
3.	Interpret basic networking terminology and concepts.
4.	Identify various network operating systems (i.e., Novell, Linux, Apple, Mac).
5.	Identify the relationship between computer networks and other communications networks (i.e., telephone system).
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 disadvantages of peer-to-peer and client/server networks.
8.	Identify services delivered by a server, such as application server, communication server, domain/directory server, fax server, file and print server, mail server, and Web server.
9.	Identify applications and server services, including printer, DNS, DHCP and Internet services.
10.	Know the functions of common help-desk tools and resources such as incident tracking, knowledge database, and staffing.
11.	Describe the role of the ISP.
12.	Define and explain the function of DNS, DHCP, WINS and host files.
13.	Differentiate between various current protocols (e.g., AppleTalk, TCP/IP, IPX/SPX, NETBEUI, DHCP).
14.	Explain current network standards and pseudo-standards (e.g., IEEE, RFCs, ISO).
15.	Describe the role of the NIC (Network Interface Card) including explanation of the MAC (Media Access Control) address and its uses.
16.	Define terms related to network media (e.g., shielding, crosstalk, attenuation).
17.	Identify standard high-speed networks (e.g., broadband, ISDN, SMDs, ATM, FDDI).
18.	Identify names, purposes, and characteristics of network connectors (e.g. RJ45 and RJ11, ST/SC/LC, MT-RJ, USB).
19.	Identify tools, diagnostic procedures, and troubleshooting techniques for networks.

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Competency: Network Operating System Concepts	
Tasks	
1.	Identify the general characteristics and functions of network operating systems (i.e., window NT, LINUX, UNIX, etc.).
2.	Lists and describe the function of the system files for major operating systems.
3.	Navigate the desktop operating system environment by using system utilities, system administrative tools, file-structure tools, and hardware-management tools.
4.	Identify tools, diagnostic procedures, and troubleshooting techniques for operating systems.
5.	Properly setup protocols, clients, and adapters on a network operating system.
6.	Identify major considerations faced when installing a network operating system.
Competency: Network Security	
Tasks	
1.	Identify security requirements and the need for data protection.
2.	Develop, document, and implement a network security plan (install, configure, upgrade and optimize security).
3.	Perform preventative maintenance for computer and network security.
4.	Demonstrate understanding of physical and logical security issues and solutions.
5.	Understand the security procedures and policies necessary to maintain, monitor, and support a network.
6.	Know common potential risks and entrance points, including internal and external risks and the tools used to neutralize them (e.g. firewalls, monitoring, antivirus, spyware, and spam protection).
7.	Know common techniques for disaster prevention and recovery (backup and restore).
8.	Explain principles of basic network security (e.g., IP spoofing, packet sniffing, password compromise, encryption).
9.	Describe the importance and demonstrate forms of network security (e.g., password strategies, user accounts).
10.	Explore the characteristics, uses, and benefits of software firewalls and hardware firewalls.
11.	Illustrate what fundamental legal issues involved with security management.
12.	Identify various security, video, building utility monitoring systems and how they link to the network.
13.	Describe and implement various forms of malware protection for servers, including antivirus software; spam, adware, and spyware filtering; and patch management.

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Competency: Equipment for Network Access (Wi-Fi, wireless)	
Tasks	
1.	Explain different functions of network communications equipment (e.g., modems, DSL/CSU, NIC, bridges, switches, routers, hubs.)
2.	Discuss various types of network adapters.
3.	Install and configure necessary hardware and software for a basic network installation, including the creation of a shared resource.
4.	Explain the uses of current and emerging specialized server hardware, including RAID, blades, SMP, storage devices ultra SCSI, and hot-swappable technologies.
5.	Identify the types of wireless network media (e.g., Wi-Fi, WiMax, GSM).
6.	Differentiate between broadband and baseband.
7.	Describe types of modems (e.g., analog, cable, DSL) and standards.
8.	Identify uses of virtual machines.
Competency: OSI Model Functionality	
Tasks	
1.	Demonstrate knowledge and identify the properties of the open system interconnection (OSI) standard.
2.	Describe the evolution of OSI from its inception to the present and into the future.
3.	Describe the primary function of each layer of the OSI model and the way each relates to networking activities.
4.	Describe devices in a network environment and their place in the OSI model.
5.	Describe the network processes that use protocols and map these to the appropriate OSI levels.
6.	Identify the OSI layers at which the following network components operate: Hubs, Switches, bridges, routers, NICs and WAPs.

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Competency: Network Topologies & Connectivity	
Tasks	
1.	Explain network topologies (e.g., star, bus, ring, broadband, baseband).
2.	List advantages and disadvantages and distinguish between the topologies and protocols of local area networks and those of wide area networks.
3.	Compare and contrast wireless networking to wired networking.
4.	Explain advantages and disadvantages of wireless technologies.
5.	Explore the concept of broadband and various incarnations, including DSL, cable, and high-speed wireless (e.g. satellite, Wi-Fi, WiMax, GSM).
6.	Identify components and features of the IEEE (Institute of Electrical and Electronics Engineers) 802 Networking Specifications.
7.	Demonstrate knowledge of the principles and operation of fiber optics, analog and digital circuits.
8.	Identify the principles and operation of wire (coaxial, fiber optics, etc.) and wireless systems and install.
9.	Identify different types of network cabling such as CAT5, Coax, fiber, and select the appropriate type of connectors for each.
10.	Install and configure network cards (physical address).
11.	Identify names, purposes, and characteristics (e.g. definition, speed and connections) of technologies for establishing connectivity.
12.	Demonstrate the use of connectivity methods (cable modem, DSL, T1, dial-up, Wi-Fi) and peripheral equipment (e.g., portable storage devices, printers, cable modem and wireless technologies).
13.	Specify the general characteristics (e.g., carrier speed, frequency, transmission type and topology) of the following wireless technologies: 802.11, 802.11x, infrared, and Bluetooth.
14.	Identify factors which affect the range and speed of wireless service (e.g., interference, antenna type and environmental factors).
15.	Test, validate, and troubleshoot IP connectivity using TCP/IP utilities.
16.	Demonstrate use of remote access (VPN, teleconferencing, etc.)

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References:

Career Cluster for Information Technology. 2008. National Association of State Directors of Career Technical Education Consortium. Washington, DC

Business Education Standards. National Business Education Association. Reston, VA.

Information Technology Fundamentals and Computer Network Software Operations / Competency Lists. 2009-2010. Virginia Department of Education. Richmond, VA

Network Administration. 1998. Career and Technical Education. Missouri Department of Elementary and Secondary Education. Jefferson City, MO.

Computer Operating Systems and Information Technology Foundations. 2005. Career and Technical Education, Tennessee Department of Education. Nashville, TN.

Networking 1 and 2 Course Student Profiles. 2008. South Carolina Career and Technology, South Carolina Department of Education. Columbia, SC.

Information Support Services and Networking Strands. 2007. Massachusetts VTEC Frameworks. Office for Career/Vocational Technical Education, Massachusetts Department of Elementary and Secondary Education, Malden, MA.

IT Technical Support and Networking Course, Student Performance Standards. 2010. Florida Department of Education, Tallahassee, FL.

Information Technology Essentials, Georgia Standards. 2009. Career Technical and Agriculture Education, Georgia Department of Education. Atlanta, GA.

Information Technology Industry Sector Curriculum Standards. 2005. Career and Workforce Innovations Unit, California Department of Education, Sacramento, CA.

Internet and Computing Core Certification Standards. 2008. Certiport, Inc. American Fork, UT.

Computer Networking Fundamentals Job Ready Assessment. 2009. NOCTI. Big Rapids, MI.