

Student Name _____

PA State ID # (10- _____)

Unit/Standard Number	<u>High School Graduation Years 2019, 2020 and 2021</u>			
	Year 1	Year 2	Year 3	
The School District of Philadelphia Office of Career and Technical Education Computer System Networking and Telecommunications Performance Assessment Log (PAL) CIP 11.0901 - Computer Systems Networking	Key N = Not Exposed to Task 1 = Knowledge (Exposed to Task) 2 = Guidance (Accomplishes Task w/ Instruct 3 = Mastery (Accomplishes Task w/o Instruct			
	Secondary Competency Task List			
100	PERSONAL AND ENVIRONMENTAL SAFETY			
101	List common causes of accidents and injuries in a computer facility.			
102	Wear personal protective equipment.			
103	List and identify safety hazard symbols.			
104	Review Safety Data Sheets (SDS) and explain their requirements in handling hazardous materials.			
105	Describe types of fire extinguishers and explain which types to use for extinguishing various fires.			
106	Use safe procedures to follow when lifting and carrying heavy objects.			
107	Describe the importance of safety as it relates to environmental issues.			
108	Identify potential hazards when working with power supplies.			
109	Identify proper disposal procedures for batteries and display devices.			
110	Identify proper disposal procedures for chemical solvents and pressurized cans.			
111	Prevent Electro Static Discharge conditions.			
112	Describe the meaning and importance of the Energy Star Rating System.			
113	Configure a computer's power management settings to maximize energy efficiency.			
114	Maintain safe work area to avoid common accidents and injuries.			
200	COMPUTER HARDWARE			
201	Categorize storage devices and backup media.			
202	Categorize the different types of computer cases.			
203	Explain motherboard components, types and features.			
204	Categorize power supplies types and characteristics.			
205	Explain the purpose and characteristics of CPUs and their features.			
206	Explain cooling methods and devices.			
207	Compare and contrast memory types, characteristics and their purpose.			

208	Distinguish between the different display devices and their characteristics.			
209	Summarize the function and types of adapter cards.			
210	Install and configure peripherals and input devices.			
211	Configure and optimize portable devices such as: laptops, tablets, and smart devices.			
212	Install and configure printers.			
213	Install configure and maintain personal computer components.			
214	Detect problems, troubleshoot, and repair/replace desk top and laptop computer components.			
215	Diagnose and repair common printer issues.			
300	TROUBLESHOOTING, REPAIR AND MAINTENANCE			
301	Apply industry standard troubleshooting methods.			
302	Identify common hardware and operating system symptoms and their causes.			
303	Use troubleshooting methods and tools for printers.			
304	Identify common laptop issues and determine the appropriate basic troubleshooting method.			
305	Integrate common preventative maintenance techniques.			
306	RESERVED			
400	OPERATING SYSTEMS AND SOFTWARE			
401	Identify different operating systems by their features.			
402	Use various user interfaces.			
403	Install and configure an operating system.			
404	Explain boot sequences, methods and startup utilities for various operating systems.			
405	Select the appropriate commands and options to troubleshoot and resolve problems.			
406	Differentiate between various operating system directory structures.			
407	Use system utilities/tools and evaluate the results.			
408	Troubleshoot common OS and software issues.			
409	Manage local users, groups and institute local security policies.			
410	Install and configure a network and workstation operating system.			
500	NETWORK TECHNOLOGIES			
501	Explain the function of common networking protocols, such as FTP, TCP/IP suite, DHCP, DNS, etc.			
502	Identify commonly used TCP and UDP default ports, including TCP ports: FTP – 20, 21, SSH – 22, TELNET – 23, HTTP – 80, etc.			
503	Identify the following address formats, including IPv6, IPv4, MAC addressing.			
504	Evaluate the proper use of addressing technologies and addressing schemes, including: subnetting: classful vs. classless, NAT, PAT, SNAT, public vs. private, DHCP, addressing schemes: unicast, multicast, broadcast, etc.			
505	Identify common IPv4 and IPv6 routing protocols, including link state, distance vector, and hybrid protocols.			

506	Explain the purpose and properties of routing, including IGP vs. EGP, static vs. dynamic, next hop, interpret routing tables and how they pertain to path selection, explain convergence (steady state).			
507	Identify the characteristics of wireless communication standards, including 802.11 standards: speeds, distance, channels, frequency, authentication and encryption.			
508	Identify the basic elements of unified communication technology such as: VoIP, Video, Real Time Services, POS and UC devices			
509	Implement technologies that support cloud and virtualization such as: virtual hardware, SANs, IaaS, SaaS, and PaaS.			
600	NETWORK MEDIA AND TOPOLOGIES			
601	Categorize standard cable types and their properties including: UTP, STP, coaxial, fiber; plenum vs. non-plenum properties: transmission speeds, distance, duplex, noise immunity, frequency.			
602	Identify common connector types, including UTP, STP, coaxial, and fiber.			
603	Identify common physical network topologies.			
604	Differentiate and fabricate cables according to TIA/EIA 568A and 568B standards, including patch, crossover, and rollover cables.			
605	Categorize common WAN technology types and properties.			
606	Categorize common LAN technology types and ethernet properties: CSMA/CD, broadcast, collision, bonding, speed, distance.			
607	Explain common logical network topologies and their characteristics, including peer to peer and client/server.			
608	Install components of wiring distribution, including vertical and horizontal cross connects, verify installation and termination.			
700	NETWORK DEVICES			
701	Install, configure and differentiate between common network connectivity devices.			
702	Identify the functions of specialized network devices such as, multilayer switch, content switch, IDS/IPS, load balancer, multifunction network devices, DNS server, bandwidth shaper, proxy server, CSU/DSU.			
703	Explain the advanced features of a switch such as, PoE, spanning tree, VLAN, trunking, port mirroring, port authentication, etc.			
704	Install a basic wireless network, including client configuration, access point placement and installation.			
705	Configure appropriate encryption, configure channels and frequencies, set ESSID and beacon, verify installation.			
800	NETWORK MANAGEMENT			
801	Explain, compare and contrast the layers of the TCP/IP and OSI models.			
802	Prepare physical and logical network diagrams, baselines, policies, procedures, and configurations and regulations.			

803	Evaluate the network based on configuration management documentation; such as: wiring schematics; physical and logical network diagrams; baselines; policies, procedures, and configurations to network devices and infrastructure; wiring schematics; physical and logical network diagrams; and, configurations and job logs as needed.			
804	Conduct network monitoring to identify performance and connectivity issues such as, packet sniffers, connectivity software, load testing, throughput testers, system logs, history logs, event logs.			
805	Perform network optimization.			
900	NETWORK TOOLS AND TROUBLESHOOTING			
901	Select the appropriate command line/graphical tools and interpret the output to verify functionality such as, Traceroute, Ipconfig, Ifconfig, Ping, Arp ping, Arp, Nslookup, Hostname, Dig, Mtr, Route, Nbtstat, Netstat.			
902	Use network scanners such as, packet sniffers, intrusion detection software, Intrusion prevention software, port scanners.			
903	Select the appropriate hardware tools such as, cable testers, protocol analyzer, certifiers, TDR, OTDR, multimeter, toner probe, butt set, punch down tool, cable stripper, snips, voltage event recorder, temperature monitor.			
904	Implement network troubleshooting methodologies, including Information gathering – identify symptoms and problems, Identify the affected areas of the network.			
905	Describe and create an action plan and solution identifying potential effects, implement and test the solution, identify the results and effects of the solution, document the solution and the entire process.			
906	Troubleshoot common wired and wireless connectivity issues and select an appropriate solution to include physical and logical issues.			
907	Troubleshoot and resolve common WAN issues such as: loss of connectivity, DNS, Router configurations, and default gateways			
1000	SECURITY FUNDAMENTALS			
1001	Configure hardware and software security devices such as, network based firewall, host based firewall, DMZ, IDS, IPS, VPN concentrator.			
1002	Implement features of a network firewall such as, application layer vs. network layer, stateful vs. stateless, scanning services, content filtering, signature identification, zones.			
1003	Configure network access security such as, ACL: MAC filtering, IP filtering tunneling and encryption: SSL VPN, VPN, L2TP, PPTP and related others.			
1004	Differentiate the principals of user authentication such as, PKI, Kerberos, AAA: RADIUS, TACACS+, network access control: 802.1x, CHAP, MS-CHAP, EAP.			
1005	Evaluate issues that affect device security such as, physical security and network access.			
1006	Identify and mitigate common security threats.			
1007	Demonstrate security features including BIOS security, password management, locking workstations, and biometrics.			

1008	Demonstrate basic forensic concepts such as: incident response, chain of custody, evidence preservation, and documentation			
1100	COMMUNICATON AND PROFESSIONALISM			
1101	Demonstrate the use of effective communication with customers such as: proper etiquette, active listening, cultural sensitivity.			
1102	Demonstrate techniques to solve customer problems.			
1103	Implement and adhere to acceptable use policies.			
1104	Demonstrate how to maintain customer confidentiality.			

PA Academic Standards for Career Education and Work

<p><i>The Career Education and Work (CEW) Standards were developed by the Pennsylvania Department of Education and complement all disciplines and other academic standards. These skills outline certain skills that students need to obtain prior to high school graduation if they are to succeed in the workplace. Although they are not required under each CIP Code's Program of Study Task List, the School District of Philadelphia requires that all CTE students are taught and master these essential skills.</i></p>				
<p>Click on the following links for more information on the CEW Standards:</p>				
<p>PA Dept. of Education CEW Website</p>				
<p>CEW Standards</p>				
Career Awareness and Preparation				
4000	Relate careers to individual interests, abilities, and aptitudes.			
4001	Analyze career options based on personal interests, abilities, aptitudes, achievements and goals.			
4002	Analyze how the changing roles of individuals in the workplace relate to new opportunities within career choices.			
4003	Evaluate school-based opportunities for career awareness/preparation, such as, but not limited to career days, community service, internships, and job shadowing.			
4004	Justify the selection of a career.			
4005	Analyze the relationship between career choices and career preparation opportunities, such as, but not limited to college degrees, certificates/licensures, entrepreneurship, and industry and military training.			
4006	Assess the implementation of the individualized career plan through the ongoing development of the career portfolio.			
4007	Review personal high school plan against current personal career goals and select postsecondary opportunities based upon personal career interests.			

	Career Acquisition (Getting a Job)			
4008	Apply effective speaking and listening skills used in a job interview.			
4009	Apply research skills in searching for a job utilizing various job search resources (e.g. CareerLinks, O-Net, Professional Organizations).			
4010	Develop and assemble, for career portfolio placement, career acquisition documents, such as, but not limited to job application, letter of introduction, postsecondary education/training applications, request for letter of recommendation and resume.			
4011	Analyze, revise, and apply an individualized career portfolio to chosen career path.			
4012	Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to commitment, communication, dependability, health/safety, and scheduling/time management.			
	Career Retention and Advancement			
4013	Evaluate personal attitudes and work habits that support career retention and advancement.			
4014	Evaluate team member roles to describe and illustrate active listening techniques such as clarifying, encouraging, and summarizing.			
4015	Evaluate conflict resolution skills as they relate to the workplace such as constructive criticism, group dynamics, managing/leadership, negotiation and problem solving.			
4016	Develop a personal budget based on career choice, such as, but not limited to charitable contributions, fixed/variable expenses, gross and net pay, and savings.			
4017	Evaluate time management strategies and their application to both personal and work situations.			
4018	Evaluate strategies for career retention and advancement in response to the changing global workplace.			
4019	Evaluate the impact of lifelong learning on career retention and advancement.			
	Entrepreneurship			
4020	Analyze entrepreneurship as it relates to personal career goals and corporate opportunities.			
4021	Analyze entrepreneurship as it relates to personal character traits.			
4022	Develop a business plan for an entrepreneurial concept of personal interest and identify available resources, such as, but not limited to community-based organizations, financial institutions and venture capital.			

Signed:

CTE Instructor	Date
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