Appendix K

INFORMATION TECHNOLOGY (IT)
YOUTH APPRENTICESHIP

GENERAL IT PATHWAY
IT ESSENTIALS
UNIT 3

Unit 3: ALL Pathways
IT Essentials

Competency
1. Apply applicable IT industry knowledge

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner:

- Demonstrates IT systems understanding based on ***current training and learning***
- Navigates the basic operating system
- Manages electronic files and folders

Learning Objectives

SYSTEMS, PRINCIPLES, CONCEPTS

- Define Information Technology (IT) and Information Systems (IS)
- Compare IT to IS
- Describe the life cycle of an information system
- Describe the various components of the IT industry
- Explain the importance of the IT industry in meeting human needs
- Explain how hardware and software communicate to accomplish tasks
- Describe elements and types of information processing
- Identify the elements of the information processing cycle (i.e., input, process, output, and storage)
- Compare internet based computing models (such in as cloud computing) to standard computing models

TERMS

- Discuss the different file extension codes and their meanings such as .exe, .ini, .doc, .jpg, .gif, .txt, .dll, etc.
- Define common terms and acronyms used in the IT industry such as:
- PC, monitor, CRT, LCD, port, peripherals, portable devices, PDA
- Hard drive, driver, interface, CPU, O/S, BIOS
- Memory, RAM
- Boot, format, configure, upgrade, file, partition

COMPONENTS

- Identify types of computing platforms and how they process information
- Explain the purpose of the following computer components and how they work together as a system:
- Motherboard/CPU
- Chipsets/BIOS and their drivers
- Memory modules (RIMM, Dimm, SDRAM, DDR, DDR2, etc)

- Hard drive technologies (IDE, EIDE, SATA, SCSI, etc)
- Video cards and slots (VGA, XVGA, VESA, SLI, etc)
- I/O ports (serial, parallel, USB, PS/2, Firewire, etc)
- Modem/NIC ports
- INPUT devices (keyboard, mouse, touchpad, cameras, scanners, midis, barcode scanners, etc)
- OUTPUT devices (printers, CRTs, LCD monitors, network devices)
- PDAs and Phones and how they connect to and share data with computers
- Power and power supplies

HISTORY & TRENDS

- Define the role of the binary and hexadecimal system in the development of information systems
- Report on historical evolution of IT in the US and globally
- Identify significant trends that impact IT locally and globally

ROLE & IMPACT

- Examine economic, social and technological changes to the IT industry
- Identify and discuss use of new technologies and communication systems and their impact on IT

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
2. Schedule appointments

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner:

- Schedules customer appointments
- Creates and maintains calendars/schedules
- Processes requests for appointments
- Verifies appointments
- Notifies customers of changes in schedule
- Manages scheduling conflicts
- Documents results of customer appointments

Learning Objectives

- Explain your organization's protocols and systems to fulfill service requirements
- Discuss how customer service is facilitated through scheduling appointments
- List items that internal and external customers consider important when scheduling appointments

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
3. Process customer requests

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner:

- Answers the phone or greet the customer professionally
- Projects a professional business image (e.g., appearance, voice, grammar, word usage, enunciation, nonverbal communication)
- Interacts with customers and colleagues in a professional manner (e.g., prompt, friendly, courteous, respectful, helpful, knowledgeable, understandable)
- Answers customer questions within the realm ***of current training & learning*** OR refer to worksite professional
- Handles equipment returns in accordance with customer service policy
- Compares equipment to order sheets to prepare for delivery to users
- ***Performs common technical requests***
- ***Assists to resolve customer requests***
- Ensures customer needs are met
- Follows through on commitments made to customers (e.g., special orders, delivery specifications, new items)
- Documents customer requests and resolution

Learning Objectives

- Describe your organization's IT services/offerings
- Identify the internal and external customers within your organization
- Discuss the process for documenting customer requests and their resolution or referral
- Explain the importance of documenting customer requests

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
4. Query, view, and extract data

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner:

- Accesses needed information using appropriate reference materials
- Enters data and edit fields and records
- Sorts and retrieves data from databases
- Queries to extract information from a file
- Queries to extract information from multiple files
- Creates reports from queries as needed
- Creates and use logical files

Learning Objectives

- Define basic database terms such as database, field, record, query, table
- Identify the appropriate database for a particular situation (e.g., flat, relational)
- Identify the variety of data types that are stored in database management systems (DMS)
- Explain the interrelationships between bytes, fields, records and databases

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
5. Perform common technical requests

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner:

- Obtains technical request
- Verifies appropriate authorization for request
- Ensures appropriate security and access protocols are observed
    - Sets up and edits user accounts such as for email, internet access, etc.
    - Enters and updates specific account data
- Documents request and action taken as required

Learning Objectives

- Outline the computer systems at your facility and how they work together
- List common technical requests that your customers request
- Describe the process and procedures for handling common technical requests at your facility
- Explain the purpose of security and access to files
- Describe the security levels and access for different types of accounts and files

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
6. Assist to resolve customer problems

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation
- while assisting a worksite professional

Performance Standard Criteria

Performance will be successful when the learner:

- Defines the problem or needs based on request
    - Uses good triage questioning techniques
    - Pre-troubleshoots by working through basic user & equipment errors first
- Troubleshoots the problem
    - Refers to technical manuals, manufacturer information, or troubleshooting posts
    - Confers with users and other worksite professionals
    - Conducts computer diagnostics
    - Uses appropriate hardware/software tools to perform troubleshooting
    - Applies information and data analysis techniques
    - Refers major hardware or software problems or defective products to vendors or technicians for service
- Diagnoses the problem
    - Systematically runs through power, connection, hardware and software checks as required by your facility
- Fixes the problem
    - Repairs/replaces malfunctioning hardware
    - Reinstalls software as needed
    - Performs backup and recovery
    - Restores system to various states (safe modes, previous date, etc.)
- Defines scope of additional work required to meet customer needs
    - Identifies skill, time, and equipment resources needed
    - Formulates a resolution plan with the customer
- Documents technical support and resolution provided ***thoroughly***
- Evaluates the problem-solving resolution to determine whether the problem was solved as intended
- Determines any needed follow-up actions
- Documents problem, diagnosis, resolution, and follow up

Learning Objectives

- Describe a systematic process and steps for basic troubleshooting
- Explain how the following common problems are found and resolved:
    - Startup sequence and beep codes
    - Priorities and interrupts at system level

    - Discuss common error messages and symptoms of hardware failures
    - Hardware versus software failure
    - Need update of flash memory (BIOS)
    - Need for hard drive maintenance procedures (defrag/scan (2) clear caches, etc)
- Practice questioning and troubleshooting skills with common hardware and software problems
- Explain the importance of documentation and follow up of problem resolutions
- Explain the impact of IT/IS problems on organizational costs (e.g., productivity, downtime)
- Classify IT/IS quality costs (e.g., prevention, evaluation, pre-delivery failure, post-delivery failure)

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
7. Perform basic back up procedures

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner:

- Loads or runs backup application(s) as required on a regular basis
- Backs up all data, data changes, etc, as required by organizational policy
- Once back up is complete, ensures appropriate storage of backed up data
- Secures storage "area" of backed up data

Learning Objectives

- Explain the need for regular backup procedures
- Identify the different types of backups (differential, complete, incremental)
- Compare different methods of backing up data and systems
- Describe the recovery process from backed up data
- Identify hot and warm site backup concepts
- Discuss the impact of secure storage of backed up data
- Describe the use of surge suppression protection and battery backup equipment
- Differentiate between disaster recovery and business continuance
- Identify the steps in a disaster recovery plan and a business resumption plan
- Identify methods for avoiding common computer system disasters
- Identify common backup devices
- Explain the purpose of archiving files

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency

8. Monitor systems to ensure optimal functioning

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner:

- Monitors system status and performance regularly as required
- Runs regular performance diagnostics
- Enters commands and observe system functioning to verify correct operations and detect errors
- Refers system messages to worksite professional
- Performs preventive maintenance procedures on system, computers, & peripheral devices
- Reviews automated scheduling software
- ***Assists to resolve problems***
- Documents monitoring, performance and any errors/malfunctions
- ***Prepares required reports*** of system operations and functioning

Learning Objectives

- Describe the purpose of regular system monitoring
- Compare types of monitoring performed at your facility and their purpose
- Explain the impact of downtime on business functions and productivity

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
9. Prepare required reports

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner:

- Identifies type of report needed
- Accesses needed data and information
- Compiles data into appropriate report
- Checks report for data parameters and information required\
- Analyzes report with worksite professional to ascertain needs, trends or problems

Learning Objectives

- List common reports your department/facility produces for customers
- Explain the purpose of regular report documentation
- Describe record retention of common reports

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
10. Install a desktop system and peripheral equipment

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner:

- Obtains technical request for task
- Verifies appropriate authorization for request
- Obtains or orders applicable equipment hardware, software, cables, operating systems, etc.
- Reviews procedure and safety requirements for appropriate installation and order of connection
- Documents actions taken once completed

DESKTOP

- Connects the power cable to the power outlet. NOTE: Do not plug the power cable into an outlet until the entire computer is set up
- Attaches the monitor cables to the back of the monitor and then to the computer
- Secures the monitor's power cable to the back of the monitor
- Attaches the mouse or wireless mouse receiver to the USB port OR mouse port on the computer
- Plugs the keyboard or wireless keyboard receiver into another USB port OR mouse/keyboard ports on the computer
- Plugs all power cords into a outlet or power strip
- Turns on the computer and the monitor
- Checks the connections and power again if any component fails to power on
- Checks that the mouse and keyboard work once the computer turns on

PERIPHERAL EQUIPMENT

- Obtains peripheral devices required such as a printer, scanner, web cam, etc.
- Verifies connection requirements with peripheral equipment manufacturer information
- Verifies power need (cord or battery) of peripheral equipment
- Connects peripheral equipment into the appropriate ports on the computer(USB, Network, Firewire, etc) as indicated
- Connects peripheral to the power source if required
- Verifies operation of the device once connected
- Checks the connections, and line-of-sight for wireless peripherals, if the peripheral fails to power on
- ***Configures the operating system and drivers*** for the desktop system and peripheral equipment

Learning Objectives

- Identify the function of computer hardware components
- Explain the proper handling of static-sensitive devices
- Describe the safety issues for installing electrical equipment
- Explain the effect of power and power surges on computer hardware and systems
- Discuss how a power strip works
- Identify primary PC components and the functions of each
- Describe the function of CPUs
- Explain how hardware components interact with each other
- Discuss how conflicts arise between hardware component interaction
- Explain how to access needed information using manufacturers' references (e.g., procedural manuals, documentation, standards, work flowcharts)
- Compare advantages and disadvantages between wired and wireless components

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency

11. Install & configure an operating system (O/S) and/or drivers

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner:

- Obtains technical request for task
- Selects appropriate tools for installation & configuration
- Confirms enough random-access memory (RAM) is installed on the computer device to run the O/S
- Reviews procedure and safety requirements for appropriate installation
- Inserts and installs the O/S from the file location source
- Follows the instructions on the screen to install the O/S
- Configures the operating system for the required facility identification & control functions, such as security, design look, system information, etc
- Configures peripheral device drivers (e.g., disk, display, printer, modem, keyboard, mouse, network)
- Connects computer device to the Internet
- Connects computer device to peripheral devices, especially printers
- Installs security programs to protect computer device from viruses, malwares, adwares, security breaches, etc
- Selects and ***installs applications*** software
- Tests integrity and drivers of all devices recognized by O/S
- Refers system errors to worksite professional
- Tests all applications loaded
- Documents system installation activities

Learning Objectives

- Explain how to prepare a hard drive
- Define the purpose of an operating system
- Explain how an O/S works
- Identify differences between O/Ss (Windows/Linux/Mac/DOS)
- Explain the typical components of an O/S (explorer, Control panel, etc)
- Describe the startup sequence of O/Ss
- Describe features of operating systems that can be personalized
- Explain how to manipulate the O/S environment
    - Desktop, files, and disks
    - Identify how to change system settings, install, and remove software
    - Explain how to start and exit a Windows application

    - Describe how to utilize sources of online help
- Compare operating system utilities (e.g., open source, mobile, proprietary)
- Describe how interfaces work between applications and hardware to be “user-friendly”
- Define API, CLI, and GUI and their use in computers
- Define the purpose of a driver
- List common examples of driver programs
- Define hardware-software interface issues for a computer system
- List common facility identification and control functions configured on computers
- Describe the licensing and copy write requirements and restrictions for operating systems, drivers, interfaces, and applications installed on a computer

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
12. Upgrade an operating system (O/S)

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner:

- Obtains technical request for task
- Selects appropriate tools for the upgrade
- Confirms enough random-access memory (RAM) is installed on the computer device to run the new O/S
- Reviews procedure and safety requirements for appropriate installation
- Backs up your files and data if required
- Inserts and accesses the upgrade file location source
- Installs the upgraded O/S
- Follows the instructions to install the upgraded O/S
- ONLY if directed by worksite professional- Wipe all previous data and re-format the hard drive IF required for a completely new system or for a problem resolution
- Re-boots the system if needed
- Configures the operating system for the required facility identification & control functions, such as security, design look, system information, etc
- Connects computer device to the Internet
- Allows the computer device to seek and install any updates according to facility policy
- Connects computer device to peripheral devices, especially printers if needed
- Installs security programs to protect computer from viruses, malwares, adwares, security breaches, etc, if required
- Selects and ***installs applications*** software if needed from wiping computer clean
- Tests integrity and drivers of all devices recognized by O/S
- Refers any system errors to worksite professional
- Tests all applications loaded
- Documents O/S upgrade activities

Learning Objectives

- Describe circumstances when it is necessary to reformat a hard drive
- Compare the processes for a simple manufacturer O/S upgrade to a complete re-formatting of the computer
- Define partitioning of a hard drive and when it is indicated

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
13. Install and uninstall an application

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner:

- Obtains technical request for task
- Documents actions taken once completed

INSTALL

- Ensures the computer device configuration meets the requirements needed for the application
- Reviews procedure and safety requirements for appropriate installation
- Closes down all other programs running
- Inserts and installs the application from the file location source
- Follows onscreen prompts during the installation
- If there are no prompts, installs the program from the "set up" or "install" file under the drive where the program is inserted
- Installs any other programs, files, utilities required to run the application
- Reboots the computer if required

UNINSTALL

- Uninstalls the application under Control Panel- Add/Remove Programs
- If not listed, verifies if application has already been removed
- If application still loaded, manually uninstalls **ONLY If** directed by worksite professional

MANUAL UNINSTALL (**WITH WORKSITE PROFESSIONAL**)

- Backs up system first
- Renames to break the shortcuts OR deletes the application's program group directory
- Checks with worksite professional regarding registry information
- Deletes any shortcut folders to application
- Disables application startup/login if it ran at startup

Learning Objectives

- Identify how software and hardware work together to perform computing tasks
- Explain how software is developed and upgraded
- Identify different types of software
- Give some reasons why applications are uninstalled
- Describe reasons for renaming an application rather than deleting it
- Explain the process for removing applications in your facility
- Explain how installed software versions on company computers are managed and controlled

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
14. Install operating system (O/S) service packs and security patches

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner

- Obtains technical request for task
- Selects appropriate tools for the upgrade
- Confirms computer device meets prerequisites of the service pack or security patch
- Reviews procedure and safety requirements for appropriate installation
- Backs up your files and data if required
- Inserts and accesses the pack or patch file source
- Installs the O/S service pack or security patch
- Follows any prompts to complete the installation
- Refers error messages to worksite professional and check installation directions/information
- Documents installation

Learning Objectives

- Explain the purpose and function of service packs and security patches

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
15. Ghost a computer

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner

- Sets up 2 hard drives- one to ghost and new one onto which the cloned files will be placed
- Checks to ensure that the destination hard drive can accommodate all the software to be ghosted
- Checks that the two hard drives are compatible
- Selects the proper software to use for ghosting
- Installs ghosting software onto the hard drive to ghost
- Checks software to ensure that it is running properly before ghosting
- Boots up the ghosting software and select the drive with the partition or files to be ghosted
- Selects a destination hard drive
- Chooses the size of the partition or files, compression choice, and name
- Confirms that files selected to ghost, and click "Proceed" and “OK” or yes
- Waits for the software to ghost the files
- Documents ghosting process

Learning Objectives

- Define “ghosting” a computer
- Compare ghosting to copying
- Explain when ghosting is indicated
- Describe how partitioning is related to ghosting a computer

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
16. Participate on a system project team

Performance Standard Condition

Competence will be demonstrated

- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria

Performance will be successful when the learner

- Reviews the scope and phases of the system project
- Reviews the evaluation of the problem and the decision evidence for the system project
- Participates in the following system project team activities as able
- Identifies the cross-functional/departmental team required for the project
    - Take part in technical training or orientation for the system project
    - Develop task list
    - Evaluate project requirements
    - Identify required resources and budget
    - Estimate time requirements
    - Develop initial project management flowchart
    - Identify interdependencies
    - Identify critical milestones
    - Evaluate risks
    - Prepare contingency plan
    - Track critical milestones
    - Participate in project phase review
    - Report project status
    - Evaluate implementation
- Periodically reviews system project activities completed during the course of the project and their results

Learning Objectives

- Determine how business activities interface with data processing functions
- Explain how increases in productivity are realized by the implementation of information systems
- Summarize the importance of cross-functional teams in achieving IT project goals
- Describe strategies for maximizing productivity in a high tech environment
- Classify costs (e.g., direct and indirect, fixed and variable, methods and standards)
- Define the purpose of common quality tools used during IT projects

Comments: