Course: A+ Certification
Grade Level: 9-12
LG 1 Origin of the Industry

High Priority Standards

National Business Education Standards
Information Technology
I. Impact on Society
Achievement Standard**:** Assess the impact of information technology in a global society.

Missouri Learning Standards
SC 8: impact of science, technology and human activity on resources and the environment

Learning Goal	Proficiency Scale
Students will be able to understand the evolution and nature of the technology industry.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: • Explaining the origin of the PC industry and its impact on today's society. • Investigating the connection between pre-1990 technology and modern technology. • Determining why modern technology companies arose to their current status as technology leaders. Level 2: Student demonstrates he/she is nearing proficiency by: • Recognizing and recalling specific vocabulary, such as: Altair, Alto, Binary code,

	CD, Circuit, Computer, Computer kit, CPU, Eniac, Enigma, I/O devices, Intel, microprocessor, MITS, Nerd, Peripheral, Programming language, Punch card, RAM, Silicon, Transistor, Vacuum tube, VCR, VHS, and VisiCalc. • Performing processes such as: o Outlining the evolution of the personal computer. o Identifying the significance of key individuals their impacts on the personal computer industry. Level 1: Student demonstrates a limited understanding or skill with the learning goal.

Learning Targets

Students know how to:

- Identify hardware and software companies.
- Describe how the earliest computers functioned.

Learning Design

1. History of the Computer by the History Channel (video)
2. Triumph of the Nerds Vol. I
3. Triumph of the Nerds Vol. II
4. Triumph of the Nerds Vol. III

Course: A+ Certification
Grade Level: 9-12
LG 2 PC Functionality

High Priority Standards **National Business Education Standards** **Information Technology** **II. Hardware** **Achievement Standard:** Describe current and emerging hardware; configure, install, and upgrade hardware; diagnose problems; and repair hardware	
Learning Goal	**Proficiency Scale**
Students will understand how computers function.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: • Explaining the purpose each computer component has in the overall functionality of a PC. • Determining how each component functions as part of the completed machine. Level 2: Student demonstrates he/she is nearing proficiency by: • Recognizing and recalling specific vocabulary, such as: AGP slots, ATA, Bluetooth, Bridge, Bus, Capacitor, CPU, DVI, FireWire, HDMI, Heat Sync, Integrated Drive Electronics (IDE), Mini-Jack, Parallel port, PCIe slots, Power

	Supply, PS/2, RAM, RAM slot, RJ-11, RJ-45, Serial ATA, Serial port, Universal Serial Bus (USB), USB 2.0, 3.0, Video Graphics Adapter (VGA).
	• Performing processes such as:
	  o Differentiating between modern generation parts and older components.
	  o Identifying all components of a PC, both internal and external.
	
	Level 1: Student demonstrates a limited understanding or skill with the learning goal.

Learning Targets

Students know how to:

- Identify names, purposes, and characteristics of specific hardware components.
- Identify operating systems.
- Organize internal computer components by purpose and order of installation.
- Diagram computer functionality and the purpose of each part related to other parts.
- Depict the shape and size of input/output ports for recognition purposes.

Learning Design

1. Input/Output PC diagram
2. Internal Chassis Diagram
3. PC Construction/Deconstruction Labs

Course: A+ Certification
Grade Level: 9-12
LG 3 Safe Handling

High Priority Standards **National Business Education Standards** **Information Technology** II. Hardware Achievement Standard**:** Describe current and emerging hardware; configure, install, and upgrade hardware; diagnose problems; and repair hardware.	
Learning Goal	**Proficiency Scale**
Students will be able to handle computer equipment safely.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: • Applying safety techniques while operating tools and installing internal computer components. • Explaining techniques for operating AC line-operated equipment safely, such as isolation transformers, grounding, leakage current testing, and GFI. Level 2: Student demonstrates he/she is nearing proficiency by: • Recognizing and recalling specific vocabulary, such as: First Aid, RF devices, Fire Extinguisher, Abrasion, GFI. • Performing processes such as:

	○ Identifying workplace safety practices, such as how to handle tools and work with electricity, prevent falls and eye damage, avoid environmental hazards. Level 1: Student demonstrates a limited understanding or skill with the learning goal.

Learning Targets

Students know how to:

- Stay safe when working with electrical equipment.
- Minimize or eliminate further damage to computer systems.

Learning Design

1. Safety Lab.
2. PC Construction/Deconstruction Labs.

Course: A+ Certification
Grade Level: 9-12
LG 4 Computer Construction

High Priority Standards

National Business Education Standards
Information Technology
II. Hardware
Achievement Standard: Describe current and emerging hardware; configure, install, and upgrade hardware; diagnose problems; and repair hardware.

Missouri Learning Standards for Science and Technical Subjects
Key Ideas and Details

3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Learning Goal	Proficiency Scale
Students will understand how to create a complex machine.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: • Constructing a computer with supplied parts and tools. • Modifying installation procedures when unique computer chassis situations

	arise. • Diagnosing computer installation errors and taking necessary corrective measures. Level 2: Student demonstrates he/she is nearing proficiency by: • Recognizing and recalling specific vocabulary, such as: Alternating Current, ATA, ATX/BTX, Berg cable Chassis/Case, Compact Disk Drive, CPU, Direct Current, ESD, Ground, Hard Disk Drive, Heat Sink, Integrate Drive Electronics, Light Emitting Diode (LED), Motherboard/Systemboard, Needle Nose Pliers, Network Interface Card (NIC), Phillips Screw, Phillips Screwdriver, RAM, Ratcheting Screwdriver, Standoff Screw, Universal Serial Bus, Video Card, Wire cutters, Static Electricity (ESD), ESD Bracelet, Anti-Static Bag. • Performing processes such as: o Describing the functionality of each internal computer component. o Outlining the order in which each part is installed sequentially. o Identifying the role ESD has in impacting the functionality of internal computer components. o Describing safety protocol when handling tools and internal computer components. o Describing accepted anti-static (ESD) procedures. Level 1: Student demonstrates a limited understanding or skill with the learning goal.

Learning Targets

Students know how to:

- Build a computer with supplied parts.

- Handle tools and computer parts safely.
- Diagnose installation errors

Learning Design

PC Construction/Deconstruction Labs.

Course: A+ Certification
Grade Level: 9-12
LG 5 Operating Systems **August 2014**

High Priority Standards

National Business Education Standards
Information Technology
II. Hardware
Achievement Standard: Describe current and emerging hardware; configure, install, and upgrade hardware; diagnose problems; and repair hardware.

Learning Goal	Proficiency Scale
Students will understand the programming required for computer functionality.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: • Installing common operating systems, such as Windows and Linux. • Configuring operating system files. • Diagnosing and troubleshooting operating system configuration errors. • Evaluating and implementing system and network security practices. Level 2: Student demonstrates he/she is nearing proficiency by:

	• Recognizing and recalling specific vocabulary, such as: BIOS, Boot Disk, CMOS, Cold Boot, Command Prompt, Desktop, Device Manager, Directory, Driver, FDisk, File Extension, Filename, :Graphical User Interface, Icon, Jump Instruction, Linux, Logical Drive, Operating System, Partition, Registry, Start Menu, Taskbar, Task Manager, Terminal, Unix, Unix Prompt, Volume, Warm Boot • Performing processes such as: o Identifying common operating systems. o Describing how various operating systems connect to networks. o Identifying operating system GUI components. o Outlining various operating system installation sequences. Level 1: Student demonstrates a limited understanding or skill with the learning goal.

Learning Targets

Students know how to:

- Install a variety of operating systems used with personal computers.

Learning Design

1. Windows XP Lab.
2. Windows 7 Lab.
3. Ubuntu Linux Lab.

Course: A+ Certification
Grade Level: 9-12
LG 6 Peripherals

High Priority Standards **National Business Education Standards** **Information Technology** II. Hardware Achievement Standard**:** Describe current and emerging hardware; configure, install, and upgrade hardware; diagnose problems; and repair hardware.	
Learning Goal	**Proficiency Scale**
Students will be able to maintain personal computer peripheral devices.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: • Analyzing the cause of and troubleshooting common peripheral errors. • Interpreting technical manual solutions for common peripheral problems. • Explaining the causes and potential effects of defective I/O (In and Out) devices on a PC. Level 2: Student demonstrates he/she is nearing proficiency by:

	• Recognizing and recalling specific vocabulary, such as: AGP, Bandwidth, Bluetooth, Bus Mouse, Chip Creep, Coaxial, Dot Pitch, Firewire, Flat Panel Monitor, Graphics Accelerator, HDMI, Hot-pluggable, Hot-swapping, Hub, I/O Controller Card, IEEE 1284, IEEE 1394, LCD, LED, Mini Jack, PCI, PCIe, PS/2, Refresh Rate, RJ-11, RJ-45, Serial, Touch Screen, USB, VGA. • Performing processes such as: o Differentiating between various I/O ports. o Deciding between various peripherals and which ones are needed for specific tasks. o Identifying the types of cables that are compatible with specific I/O ports. o Describing the types of devices that are compatible with specific I/O ports. o Summarizing the troubleshooting process. o Describing parts of various I/O devices. Level 1: Student demonstrates a limited understanding or skill with the learning goal.

Learning Design

1. Peripheral Problem Troubleshooting Lab.
2. I/O port Diagram.

Course: A+ Certification
Grade Level: 9-12
LG 7 Maintenance and Repair

High Priority Standards	
National Business Education Standards **Information Technology** **II. Hardware** **Achievement Standard:** Describe current and emerging hardware; configure, install, and upgrade hardware; diagnose problems; and repair hardware.	
Learning Goal	**Proficiency Scale**
Students will be able to maintain personal computer internal functions.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: • Evaluating errors within system log files. • Mapping potential sequences for addressing possible problem areas as part of the troubleshooting and repair process.

	Level 2: Student demonstrates he/she is nearing proficiency by: • Recognizing and recalling specific vocabulary, such as: alternating current, ATA, ATX/BTX, Berg Cable, BIOS, Boot Disk, Chassis/Case, CMOS, cold boot, command prompt, compact disk drive, CPU, desktop, device manager, direct current, directory, driver, ESD, FDisk, file extension, filename, graphical user interface, ground, hard disk drive, heat sink, icon, integrate drive electronics, jump instruction, light emitting diode (LED), Linux, logical drive, motherboard/systemboard, needle nose pliers, network interface card (NIC), operating system, partition, phillips screw, phillips screwdriver, RAM, ratcheting screwdriver, registry, standoff screw, start menu, taskbar, task manager, terminal, universal serial bus, Unix, Unix prompt, video card, volume, warm boot, wire cutters, antistatic wipes, compressed air, cotton swabs, lint-free rags, vacuum, ESD, microfiber, filter, anti-bacterial wipes, utility software. • Performing processes such as: o Identifying cleaning chemicals and supplies that are safe for internal computer part usage. o Identifying valid online resources with solutions to common PC problems. o Describing the significance of backing up a PC before troubleshooting problems. Level 1: Student demonstrates a limited understanding or skill with the learning goal.
Learning Targets **Students know how to:** • Outline current cable infrastructure. • Diagram current network configurations. • Disassemble and reassemble a computer chassis in order to access internal spaces for cleaning.	

Learning Design
1. Safety Lab. 2. PC Tools Recognition Lab. 3. Internal/External PC Cleaning Lab. 4. PC Troubleshooting Scenarios.

Course: A+ Certification
Grade Level: 9-12
LG 8 Applications

High Priority Standards	
National Business Education Standards **Information Technology** **V. Productivity Software** **Achievement Standard:** Identify, evaluate, select, install, use, upgrade, and customize productivity software; diagnose and solve software problems.	
Learning Goal	**Proficiency Scale**
Students will be able to maintain personal computer applications.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: • Troubleshooting computer applications and file management systems. • Differentiating between operating system and application errors. • Devising and performing potential solutions to common application errors.

	Level 2: Student demonstrates he/she is nearing proficiency by: • Recognizing and recalling specific vocabulary, such as: 32-bit, 64-bit, BIOS, boot disk, BSOD, CMOS, cold boot, command prompt, compatible, control panel, desktop, device manager, directory, driver, executable files, FDisk, file extension, filename, graphical user interface, icon, jump instruction, Linus, logical drive, malware, menu, multitasking, multithreading, operating system, partition, registry, start menu, system file, system requirements, taskbar, task manager, terminal, Trojan Horse, Unix, Unix prompt, virus, volume, warm boot, worm. • Performing processes such as: o Describing general steps when troubleshooting an under-performing application. o Describing how the task manager can be used to address application concerns. o Identifying parts of an application and locations within the application for troubleshooting specific errors. Level 1: Student demonstrates a limited understanding or skill with the learning goal.

Learning Targets

Students know how to:

- Install common applications.
- Uninstall common applications.
- Use the internet as a solutions tool.

Course: A+ Certification
Grade Level: 9-12
LG 9 Electricity

High Priority Standards **National Business Education Standards** **Information Technology** **II. Hardware** **Achievement Standard:** Describe current and emerging hardware; configure, install, and upgrade hardware; diagnose problems; and repair hardware.	
Learning Goal	**Proficiency Scale**
Students will understand the electrical function of each computer component.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: • Generating electrical measures of internal PC components using a multimeter. • Diagnosing internal computer component problems as a result of electrical measurements.

	Level 2: Student demonstrates he/she is nearing proficiency by: • Recognizing and recalling specific vocabulary, such as: AC, amp, capacitor, conductor, DC, desktop, diode, EMI, Energy Star compliant, ESD, ESD bracelet, form factor, ground, hot, insulator, line conditioner, multimeter, neutral, ohm, power supply, resistor, semiconductors, tower, transformer, transistor, UPS, volt, watt • Performing processes such as: o Describing the nature of electrical devices. o Summarizing types of computer cases and motherboard form factors. o Describing the functionality of a multimeter. o Identifying basic electrical units of measurement. Level 1: Student demonstrates a limited understanding or skill with the learning goal.

Learning Design

1. Power Supply Lab.

Course: A+ Certification
Grade Level: 9-12
LG 10 Networks

High Priority Standards	
National Business Education Standards **Information Technology** II. Hardware Achievement Standard**:** Describe current and emerging hardware; configure, install, and upgrade hardware; diagnose problems; and repair hardware. XVI. Technical Support and Training Achievement Standard**:** Develop the technical and interpersonal skills and knowledge to train and support the user community.	
Learning Goal	**Proficiency Scale**
Students will understand computer networks.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: • Differentiating between network topologies. • Explaining different types of physical network architectures. • Explaining how networking works with various operating systems.

	Level 2: Student demonstrates he/she is nearing proficiency by: • Recognizing and recalling specific vocabulary, such as: 10BaseT, 100BaseT, 802.11a,b,g,n, AP, Adapter Address, Bandwidth, Bluetooth, Bridge, Broadband, Broadcast, Bus Topology. Cable Modem, Client, Coaxial Cable, Gateway, DHCP, DSL, IP Address, Ethernet, Fiber Optic, Gigabit, Host, Host Name, Hub, Intranet, LAN, MAC Address, NETBEUI, NIC, Printer, Node, Octet, Patch Cable, P2P, Physical Address, Ping, Protocol, Proxy, Server, Repeater, RJ-45, STP, UTP, Static IP, Subnet, TCP/IP, Token Ring, WAN, Wi-Fi, WLAN • Performing processes such as: o Describing how to install a network card and a network protocol using various operating systems. o Describing troubleshooting tools and tips for network connections. o Describing how to connect networks to each other. o Identifying how computing devices connect wirelessly for Internet connectivity. Level 1: Student demonstrates a limited understanding or skill with the learning goal.

Learning Targets

Students know how to:

- Diagnose network connectivity.
- Generate patch and crossover cables.
- Install network cards.
- Connect devices to a network both wirelessly and hardwired.

Learning Design

1. Local Area Network Diagram.
2. Wide Area Network Diagram.
3. LAN Lab.

Course: A+ Certification
Grade Level: 9-12
LG 11 Customer Service

High Priority Standards

National Business Education Standards
Information Technology
II. Hardware
Achievement Standard**:** Describe current and emerging hardware; configure, install, and upgrade hardware; diagnose problems; and repair hardware.
XVI. Technical Support and Training
Achievement Standard**:** Develop the technical and interpersonal skills and knowledge to train and support the user community.

Learning Goal	Proficiency Scale
Students will understand customer relationships and user support.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: • Generating user and/or network administrator documentation. • Developing constructive problem solving methods when interacting with computer users. • Explaining and demonstrating various troubleshooting approaches to common PC problems. Level 2: Student demonstrates he/she is nearing proficiency by: • Recognizing and recalling specific vocabulary, such as: service documentation, customer support, rescue disk, startup disk, virus protection, troubleshooting, • Performing processes such as: o Producing maintenance logs. o Identifying specific security procedures. o Communicating remote access and phone support options. o Explaining the purpose of a rescue or startup disk. o Explaining the importance and availability of diagnostic and virus protection software. Level 1: Student demonstrates a limited understanding or skill with the learning goal.