

# Computer Hardware

(10254)

## **Rationale Statement:**

With the increase in personal computers, home computers, and computers in schools and businesses, it is important that students are trained to be able to maintain and upgrade computers and their components. The computer hardware course will prepare students to become more knowledgeable about the work of a computer technician as well as in the area of computer hardware through hardware troubleshooting and hands-on computer repair skills.

After completing the course students will have a better understanding of computer hardware and components and the ability to build and upgrade a computer. Students enrolled in the course should have an interest in maintaining and upgrading their own computer or in a career as a computer technician. Topics covered in the class include individual hardware components, upgrading and troubleshooting a computer, formatting and partitioning hard drives, and network topologies.

## **Course Description:**

Grade Level: 10 - 12

## **Course Topics:**

- Individual hardware components
- Installation of hardware components
- Upgrading and troubleshooting a computer
- Formatting and partitioning hard drives
- Network topologies

## Core Technical Standards & Examples

### Indicator #1 Apply knowledge of hardware design, operation and maintenance.

Bloom's Taxonomy Level	Standard and Examples
Applying	<p><b>CH 1.1 Apply knowledge of system board.</b></p> <p>Examples:</p> <ul style="list-style-type: none"><li>• Demonstrate knowledge of chip configuration and structure.</li><li>• Demonstrate knowledge of the functions of internal components</li><li>• Demonstrate knowledge of the characteristics and operation of controller expansion cards.</li><li>• Identify primary PC components and functions of each.</li></ul>
Applying	<p><b>CH 1.2 Install primary PC components.</b></p> <p>Examples:</p> <ul style="list-style-type: none"><li>• Demonstrate knowledge of how hardware components interact and how conflicts arise.</li><li>• Access needed information using manufacturers' references</li><li>• Secure supplies and resources.</li><li>• Respond to error messages and symptoms of hardware failures.</li><li>• Install boards to support peripherals.</li><li>• Connect peripherals to CPU.</li><li>• Employ appropriate safety precautions when working with PCs.</li><li>• Configure system.</li><li>• Verify system operation.</li><li>• Document system installation activities.</li><li>• Backup system configuration.</li><li>• Test all applications.</li></ul>
Applying	<p><b>CH 1.3 Troubleshoot computer hardware components.</b></p> <p>Examples:</p> <ul style="list-style-type: none"><li>• Identify priorities and interrupts at system level.</li><li>• Demonstrate the use of volatile and nonvolatile memory.</li><li>• Repair/replace volatile and nonvolatile memory.</li><li>• Test system using diagnostic tools/software.</li><li>• Differentiate between hardware and software failure.</li><li>• Update flash memory (BIOS).</li><li>• Optimize hard drive.</li><li>• Gather information on problem from user.</li><li>• Conduct appropriate diagnostic tests.</li><li>• Repair/replace malfunctioning hardware.</li><li>• Recover data and/or files.</li><li>• Restore system to normal operating standards</li></ul>

**Indicator #2: Identify software system requirements.**

<b>Bloom's Taxonomy Level</b>	<b>Standard and Examples</b>
<b>Remembering</b>	<b>CH 2.1 Identify new IT technologies relevant to computer hardware.</b> Examples: <ul style="list-style-type: none"><li>• Assess the importance of new technologies to future developments.</li><li>• Identify system-processing requirements.</li><li>• Identify data communication trends and major current issues.</li><li>• Determine compatibility of hardware and software.</li></ul>
<b>Understanding</b>	<b>CH 2.2 Explain measurement techniques for increased productivity due to information systems implementation.</b> Examples: <ul style="list-style-type: none"><li>• Identify benchmark metrics for measuring</li><li>• Measure increases in productivity realized by the implementation of information systems.</li></ul>

**Indicator #3: Provide computer hardware, operating system, and software support.**

<b>Bloom's Taxonomy Level</b>	<b>Standard and Examples</b>
<b>Analyzing</b>	<p><b>CH 3.1 Analyze technical needs to provide customer support.</b> Examples:</p> <ul style="list-style-type: none"><li>• Identify support requirements.</li><li>• Apply information and data analysis techniques.</li><li>• Identify skill level needs.</li><li>• Identify resources and risks.</li><li>• Evaluate present data and system configuration.</li><li>• Formulate a support plan.</li><li>• Balance resources against customer needs.</li><li>• Manage multiple customer requirements.</li></ul>
<b>Applying</b>	<p><b>CH 3.2 Provide maintenance related to hardware, operating systems, and software.</b> Examples:</p> <ul style="list-style-type: none"><li>• Provide high-level technical support</li><li>• Respond to user questions</li><li>• Diagnose problems within system.</li><li>• Perform technical functions required by customer/user.</li><li>• Employ technical and computer tools to perform task in the most cost-effective manner.</li><li>• Manage working relationships with customer within support boundaries.</li><li>• Perform system-tuning functions.</li><li>• Access needed information using appropriate reference materials.</li><li>• Provide help to first line user-support personnel to answer user questions.</li><li>• Communicate and document technical support provided.</li></ul>