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CTE Standards Unpacking
Computer Hardware & Software

Course: Computer Hardware & Software
Course Description: The Computer Hardware & Software course will prepare students to become more knowledgeable about the integral components of a computer system. Topics covered in the class include individual hardware components, upgrading and troubleshooting a computer, installing operating systems, and configuring basic network services.
Career Cluster: Information Technology
Prerequisites: Introduction to Information Technology Careers (Recommended), Computer Applications (Recommended)
Program of Study Application: Computer Hardware & Software is cluster course leading to the Programming and Networking & Hardware pathways.

<table>
<tr><td colspan="3">INDICATOR #CIT 1: Apply knowledge of hardware design, operation and maintenance</td></tr>
<tr><td colspan="3">SUB-INDICATOR 1.1 (Webb Level: 2): Understand how to design and assemble systems that use computer programs to interact with hardware</td></tr>
<tr><td colspan="3">SUB-INDICATOR 1.2 (Webb Level: 3): Install and configure essential computer hardware and software components</td></tr>
<tr><td>Knowledge (Factual):
Design, operation, and maintenance of the internal components of a computer.</td><td>Understand (Conceptual):
Understand how to design and assemble systems that use hardware and software components.</td><td>Skills (Application):
Install and configure a usable computer.</td></tr>
<tr><td colspan="3">Benchmarks
Students will be assessed on their ability to:
Identify primary personal computer components and functions of each.
Connect peripheral to central processing unit (CPU).
Document system installation activities.
Test functionality of components and verify system operations.
Differentiate between
Differentiate between hardware and software failure.
Recover data and/or files.</td></tr>
<tr><td colspan="3">Academic Connections</td></tr>
<tr><td colspan="2">ELA Literacy and/or Math Standard (if applicable, Science and/or Social</td><td>Sample Performance Task Aligned to the Academic Standard(s):</td></tr>
</table>

Studies Standard): **Language Arts Standards:** RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text RI7.Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. SL4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose and audience. `	*In a writing or multimedia project, Students will explain the primary components and internal functions of a computer, how to design and assemble systems that use hardware and software components and how to install and configure a useable computer.

INDICATOR #CIT 2: **Understand the relationships among computer hardware, networks, and operating systems**
SUB-INDICATOR 2.1 (Webb Level: 1): Identify new IT technologies relevant to computer hardware
SUB-INDICATOR 2.2 (Webb Level: 2): Determine compatibility of hardware and software
SUB-INDICATOR 2.3 (Webb Level: 2): Understand the difference between an

operating system, utility programs, and application software

Knowledge (Factual):	**Understand (Conceptual):**	**Skills (Application):**
• Operating systems and new technologies. • Components involved in operating a successful computer.	• Understand the connections between computer hardware, networks, and operating systems.	• Demonstrate how hardware, networks and operating systems interact.

Benchmarks

Students will be assessed on their ability to:

- Identify system processing requirements.
- Determine if hardware meets software requirements.
- Install an operating system.
- Install/un-install and configure various application software.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
Language Arts Standards: RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text RI7.Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.	*In a writing or multimedia project, students will explain computer operating systems and new technologies, components involved in creating a successful computer, the connections between hardware, networks and operating systems, and how hardware and operating systems interact. *Students will read specifications from manual and/or case studies to determine hardware requirements for software. *Students will demonstrate how to install and uninstall various application software.

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INDICATOR #CIT 3: **Understand basic networking services**		
SUB-INDICATOR 3.1 (Webb Level: 2): Understand the basics of Internet protocol (IP) addressing		
SUB-INDICATOR 3.2 (Webb Level: 4): Troubleshoot basic network problems		
Knowledge (Factual): • Basics of Internet protocol, addressing and troubleshooting basic network problems.	**Understand (Conceptual):** • Basic networking services. • Understand the difference between static and dynamic host configuration protocol addressing.	**Skills (Application):** • Configure a computer for an IP address and resolve conflicts.

Benchmarks

Students will be assessed on their ability to:

- Use network utility commands to troubleshoot problems.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
Language Arts Standards: RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text RI7.Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.	*Students will show/demonstrate how using a manual can assist in troubleshooting computer problems. *Students will perform a live demonstration using multi-media to configure a computer for an IP address and resolve conflicts. *In a writing or multimedia project, students will explain the basics of internet protocol, and basic troubleshooting of network problems. * In a writing or multimedia project, students will explain the difference between static and dynamic host configuration protocol addressing.

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<table>
<tr><td colspan="3">INDICATOR #CIT 4: Explore Careers in information technology</td></tr>
<tr><td colspan="3">SUB-INDICATOR 4.1 (Webb Level: 1): Identify skills, interests, and abilities related to information technology</td></tr>
<tr><td colspan="3">SUB-INDICATOR 4.2 (Webb Level: 2): Identify personal interests using survey instruments with information technology occupations</td></tr>
<tr><td colspan="3">SUB-INDICATOR 4.3 (Webb Level: 3): Research labor market information for information technology</td></tr>
<tr><td colspan="3">SUB-INDICATOR 4.4 (Webb Level: 2): Demonstrate necessary job skills needed for Information and Technology industries</td></tr>
<tr><td>Knowledge (Factual):
Skills, interests, interest inventories, labor market information and abilities related to information technology.</td><td>Understand (Conceptual):
IT Career options and outlook and their alignment with personal interest and skills.</td><td>Skills (Application):
Explore how your skills, interests and abilities match Information Technology careers.</td></tr>
<tr><td colspan="3">Benchmarks
Students will be assessed on their ability to:
SDMyLife assessments including Ability Profiler, Career Matchmaker.
Consider the financial impact of an Information Technology career.
Display ability to work as part of a team and take direction from others.</td></tr>
<tr><td colspan="3">Academic Connections</td></tr>
<tr><td colspan="2">ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):

Language Arts Standards:

SL4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are</td><td>Sample Performance Task Aligned to the Academic Standard(s):

*In a writing or multimedia project, students will explain the career of Information Technology.

*In reflective writing, assignment, students will assess the qualities of a Information Technoogy Engineer. Students will reflect on their own</td></tr>
</table>

addressed, and the organization, development, substance, and style are appropriate to purpose, and audience. W2.Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. W4.Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W6.Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. ` W8.Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation	personal knowledge to assess if the career path is right for them, or what they need to accomplish to make this their career path. *Students participate in group presentation assessing the needs of a manufactured/mock business and their computer needs in a effort to gain experience as a real Information Technology Engineer.

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Additional Resources

Please list any resources (e.g., websites, teaching guides, etc.) that would help teachers as they plan to teach these new standards.