Lesson Plan

Course Title: Computer Maintenance

Session Title: CPUs

Lesson Duration: Will vary from instructor to instructor

Performance Objective:
Upon completion of this assignment, the student will further understand the basic principles of the central processing unit (CPU) and its counterparts.

Specific Objectives:

- Describe how the CPU works.
- Attributes on how to rate CPUs.
- Gain knowledge about the Pentium, AMD, and Cyrix processor brands.
- Identify the heat sink and cooling fan, and how they work.
- Define terms associated with the lesson.
- Considerations when purchasing a CPU.

Preparation

TEKS Correlations:
This lesson, as published, correlates to the following TEKS. Any changes/alterations to the activities may result in the elimination of any or all of the TEKS listed.

§130.273. Computer Maintenance (One to Two Credits).

(3) The student applies academic skills to the requirements of computer technologies. The student is expected to:

(A) demonstrate effective verbal and written communication skills with individuals from varied cultures such as fellow workers, management, and customers;

(4) The student acquires an understanding of computer technologies. The student is expected to:

(A) explain the fundamentals of microprocessor theory;
(F) explain the relationships relative to data-communications theory;
(G) describe the architecture of various computer systems;
(H) describe the function of computer components such as central processing units, storage devices, and peripheral devices;

(5) The student knows the proper function and application of the tools, equipment, and materials used in computer technologies. The student is expected to:

(D) identify new and emerging technologies that may affect the field of computer technology such as quantum computing, phototonics, and nanotechnology.

(6) The student applies the concepts and skills of the trade in simulated work situations. The student is expected to:

(C) identify the operational features and proper terminology related to computer systems;

(D) identify the various components of a computer system such as the central processor, basic input and output system, read-only memory, and random access memory

Instructor/Trainer

References:

- Peter Norton's Introduction to Computers 4th Edition, Lesson 2: Standard Methods of Input
- PC Upgrade and Repair Simplified 2nd Edition
- Comp TIA's A+ Certification Handbook
- www.Intel.com

Instructional Aids:

1. CPU PowerPoint Presentation
2. CPU Exam
3. CPU Exam Key
4. CPU – Lab 1
5. CPU – Lab 2

Materials Needed:

1. Copies of the Lab Assignments (1) for each student

Equipment Needed:

1. A projection system to display PowerPoint presentation
2. Personal Computer with access to the Internet
3. Old computers to work the labs.

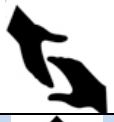
Learner

Students should read the appropriate curriculum material for CPUs, depending on the text/ curriculum being used for this course. This lesson can be taught with only the PowerPoint presentation, and the equipment outlined above.

Introduction	
MI	**Introduction (LSI Quadrant I):**
	SAY: The Central Processing Unit (CPU) chip processes instructions, performs calculations, and manages the flow of information through a computer system. **ASK:** Does anyone know what part of the human body the CPU is like? *(the brain, because the brain processes instructions, performs calculations, and manages the flow of information through the body)* **SAY:** There are several factors that should be considered when selecting a

	CPU, such as the manufacturer, speed, socket types, and fans. We will go over these factors in further detail.	
Outline		
MI	**Outline (LSI Quadrant II):**	**Instructor Notes:**
	I. CPU a. How it works II. Attributes used to rate CPUs III. Types of CPUs a. Intel b. AMD c. Cyrix IV. Cooling Fans V. Heat sinks VI. Memory buses VII. System Clock VIII. Multiprocessing IX. Choosing a CPU a. Manufacturer b. Speed c. Socket Type d. Fans	**Note:** Instructors can use the PowerPoint slides, handouts, and note pages in conjunction with the following outline.
Application		
MI	**Guided Practice (LSI Quadrant III):**	
	1. The teacher demonstrates each lab principle. 2. The teacher maintains direct supervision in the lab, providing guidance when warranted.	
MI	**Independent Practice (LSI Quadrant III):**	
	1. Students work individually on lab assignments, demonstrating their skills in identifying and discussing the various lab requirements and results.	
Summary		
MI	**Review (LSI Quadrants I and IV):**	
	Checking for understanding (Q&A Session) **Q:** How does a CPU work?	

	A: *Input/Output (I/O) unit – manages data and instructions entering and leaving the CPU* *Arithmetic Logic Units (ALUs) – do all comparisons and calculations* *Control unit – manages all activities inside the CPU itself* **Q:** Who are some of the more common manufacturers of CPUs? **A:** *Intel, AMD, Cyrix.* **Q:** What is the main function of the heat sink? **A:** *To pull heat away from the CPU.* **Q:** What are some of the considerations when purchasing a CPU? **A:** *Manufacturer, speed, socket type, fans.*
Evaluation	
MI	**Informal Assessment (LSI Quadrant III):**
	Monitor student progress during independent practice, and provide independent re-teach/redirection as needed.
MI	**Formal Assessment (LSI Quadrant III, IV):**
	Use the CPU Exam and Exam Key.
Extension	
MI	**Extension/Enrichment (LSI Quadrant IV):**
	Students that have mastered the lab assignments can peer-tutor students (one-on-one) that are having difficulty with the lab.

Icon	MI	Teaching Strategies	Personal Development Strategies
	**Verbal/ Linguistic**	Lecture, discussion, journal writing, cooperative learning, word origins	Reading, highlighting, outlining, teaching others, reciting information
	**Logical/ Mathematical**	Problem–solving, number games, critical thinking, classifying and organizing, Socratic questioning	Organizing material logically, explaining things sequentially, finding patterns, developing systems, outlining, charting, graphing, analyzing information
	**Visual/Spatial**	Mind-mapping, reflective time, graphic organizers, color-coding systems, drawings, designs, video, DVD, charts, maps	Developing graphic organizers, mind-mapping, charting, graphing, organizing with color, mental imagery (drawing in the mind's eye)
	**Musical/ Rhythmic**	Use music, compose songs or raps, use musical language or metaphors	Creating rhythms out of words, creating rhythms with instruments, playing an instrument, putting words to existing songs
	**Bodily/ Kinesthetic**	Use manipulatives, hand signals, pantomime, real life situations, puzzles and board games, activities, role-playing, action problems	Moving while learning, pacing while reciting, acting out scripts of material, designing games, moving fingers under words while reading
	**Intrapersonal**	Reflective teaching, interviews, reflective listening, KWL charts	Reflecting on the personal meaning of information, studying in quiet settings, imagining experiments, visualizing information, journaling
	**Interpersonal**	Cooperative learning, role-playing, group brainstorming, cross-cultural interactions	Studying in a group, discussing information, using flash cards with others, teaching others
	**Naturalist**	Natural objects as manipulatives and as a background for learning	Connecting with nature, forming study groups with like-minded people
	**Existentialist**	Socratic questions, real-life situations, global problems/questions	Considering the personal relationship to the larger context

Computer Maintenance
CPU

Lab 1: Replacing a Pentium CPU

Student Name: _____ Date: _____

Step 1
- Before replacing a CPU, turn off the computer and unplug the power cable.
- Remove the cover from the computer case and ground yourself.

Step 2
- Disconnect the CPU fan's cables from the power supply.

Step 3
- If necessary, release the clip that secures the CPU fan to the system board.
- Lift the lever that secures the CPU to the socket.

Step 4
- Lift the CPU out of the socket.

Step 5
- Align the beveled corner of the new CPU with the beveled corner on the socket.
- Place the CPU in the socket.

Step 6
- Push the lever down to secure the CPU in the socket.

Step 7
- If necessary, connect the CPU fan's cable to the power supply.
- Replace the cover on the computer case.

Computer Maintenance
CPU

Lab 2: Searching for a CPU

Student Name: _____ Date: _____

- Using the internet, research three different suppliers of CPUs. How much does a CPU cost? What capabilities of the CPU reflect the cost? Which CPU would you purchase and why?

*In your response, be sure to cite the source of your information, including the supplier, the CPU make and model, the date you obtained your information, and the URL where you found the information.

Name _____ Date _____

CPU Exam

True/False
Indicate whether the sentence or statement is true or false.

____ 1. A CPU's design determines its basic speed, and no other factors can improve its performance.

____ 2. The computer's system bus is located on the motherboard, and provides a path that connects the CPU to other devices on the motherboard.

____ 3. If the cache memory resides on the CPU, it is called Level-2 (L2) cache.

____ 4. Aside from the break from numeric model names, there was no difference between the Pentium microprocessor and its predecessor, the 80486.

____ 5. The Pentium II was the first Intel processor to be housed in a cartridge instead of using the wafer format of other chips.

____ 6. Advanced Micro Devices (AMD) has emerged as a primary competitor to Intel.

____ 7. Motorola manufactures the microprocessors that are used in Apple computers, among others.

____ 8. The CPU processes data into information.

____ 9. The first step in the Instruction Cycle is to interpret the instruction.

____ 10. The first step in the Execution Cycle is to fetch the data.

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question (some questions may have more than 1 correct answer).

____ 11. The term *megahertz* means
a. Thousands of cycles per second
b. Millions of cycles per second
c. Billions of cycles per second
d. Trillions of cycles per second

____ 12. No actual data is carried on this bus.
a. System bus
b. Expansion bus
c. Address bus
d. Data bus

____ 13. The CPU, memory, and other hardware devices on the motherboard connect to one another via the
a. Data bus
b. Expansion bus
c. Address bus
d. None of the above

____ 14. All processors in the Pentium family have a data bus capacity of
   a. 8 bits
   b. 16 bits
   c. 32 bits
   d. 64 bits

____ 15. The Pentium is considered to be part of which series of Intel chips?
   a. 80x86
   b. 80x88
   c. MII
   d. 680x0

____ 16. Some of the manufacturers for CPUs are
   a. Intel
   b. AMD
   c. Cyrix

____ 17. An example of an Output Device is:
   a. Keyboard
   b. Monitor
   c. Mouse

____ 18. Example of Input Devices are
   a. Keyboard
   b. Monitor
   c. Mouse

Short Answer

19. What is the biggest single enhancement to the Pentium Pro processor?

Essay

20. Name the key features that one should look for when purchasing a CPU.

CPU Exam KEY

TRUE/FALSE

1. F
2. T
3. F
4. F
5. T
6. T
7. T
8. T
9. F
10. T

MULTIPLE CHOICE

11. B
12. C
13. A
14. D
13. A
14. D
15. B
16. A, C
17. B
18. A, C

SHORT ANSWER

19. Intel departed from simply increasing the speed of its Pentium processor line by introducing the Pentium Pro processor. While compatible with all of the previous software written for the Intel processor line, the Pentium Pro is optimized to run 32-bit software.

ESSAY

20.

- Manufacturer – the most popular type of CPU is from Intel
- Speed – the faster the speed of a CPU, the faster the computer can operate
- Socket Type – the type of socket on the system board determines the type of CPU you can install on the computer
- Fans – if upgrading, make sure you have enough space inside the computer to fit a new CPU's fan