SPECIAL PROGRAM IN TECHNICAL VOCATIONAL EDUCATION (SPTVE)
COMPUTER SYSTEMS SERVICING 8 Q3-W6

I. Topic: Power Supply Unit (PSU)

II. Objectives:

1. define power supply Unit;
2. identify different connectors and functions of power supply unit;
3. perform how to measure the electricity flows in the units including amperage, voltage, resistance and wattage and;
4. value the importance of hoe electricity flows from a power source through wires.

III. Brief Introduction of the Lesson

A **Power Supply Unit (PSU**) is the component that supplies power to the other components in a computer. It *converts* high voltage *alternating current* (AC) power to the lower voltage- *direct current* (DC), the power that the motherboard on disk drives need. Generally, a PC uses 12-volt current to power devices like hard drives, CD-ROM drives and 5-volt, 3.3-volt current to support on board electronics.

https://tinyurl.com/yxchkfme on 1/18/21

Different types of connectors in power supply unit	**Function**
20 /24 Pin Molex ATX Power Connector 	This is the connector which goes to the motherboard to provide it with power. On older motherboards, this was a 20-pin connector, these days it has been increased to 24-pin.
4 Pin Molex P4 12V Power Connector 	A second connector that goes to the motherboard (in addition to the main 24-pin connector) to supply dedicated power for the processor.
SATA power connectors 	15-pin connectors for components which use SATA power plugs – this includes HDDs, SSDs, and DVD/CD drives.
6 or 8-Pin PCIe Connector 	This is used for PCI Express graphics cards, an eight-pin connector will likely be seen on newer model power supplies.

4 pin Molex connector 	This is used to power various components, including hard drives and optical drives.
4 pin Berg connector  https://en.wikipedia.org/wiki/Berg_connector	It is used to connect the PSU to small form factor devices, such as 3.5" floppy drives.

How does electricity work in a system unit?

In order to understand how these units of electricity work together, a *system of water pipes* is often used as an analogy. In this analogy, Voltage is equivalent to water pressure, Current is equivalent to flow rate and Resistance is equivalent to pipe size. Let's say we have a tank of water attached to a hose. If we increase the pressure in the tank, more water will come out of the hose. Thus, if we increase the voltage in an electrical system, we will also increase the current.

If we make the diameter of the hose smaller, resistance will increase, causing less water to come out of the hose. Thus, if we increase the resistance in an electrical system, we will decrease the current.

There are four units of measure for electricity:

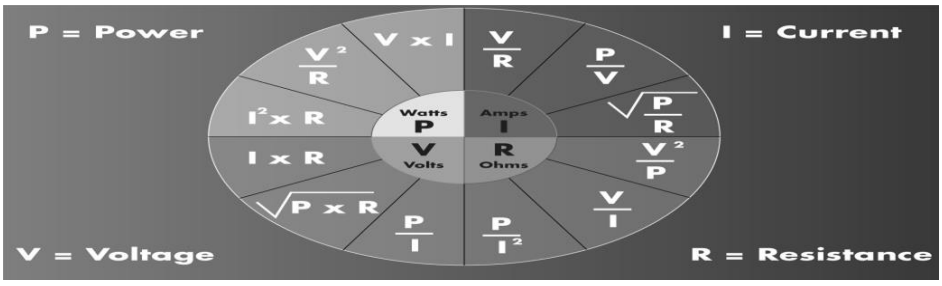
Voltage - Potential differences in an electrical charge creates a force called voltage. Voltage is measured in units called *volts*.
An ATX power supply provides five voltages: +12v, -12v, +5v, -5v, +3.3v

Wattage -The total amount of power needed to operate a component is wattage. It is measured *in watts*.

Amps - The amount of electricity flowing through an electrical system is called *current*. It is measured in *amperes or amps or A*. An ammeter is used to measure electrical currents in amps.

Ohms - Electrical resistance is measures in Ohms. Resistance is a property that opposes the flow of electricity. Resistance is measured in ohms, or Ω (omega), for short. So, five ohms can be written 5Ω.

Refer to the circle of formulae below to calculate an electricity involving voltage, current, resistance, or power/watts.



https://tinyurl.com/y6k942wr on 1/19/2021

For example:

What is the current in an electrical circuit with a voltage of 120V and 12Ω of resistance?

Refer to the circle of formulae, I is *current*; V is *voltage*; R is *resistance*.

Where: V= 120V; R= 12Ω; I=? The formula is I = V/R

Explanation: The current in an electrical circuit with a voltage of 120V and 12Ω of resistance is 10A.

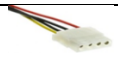
IV. Activities

Activity 1. Directions: Choose the correct answer from the box below then write your answer before each the number.

Wattage	power supply unit	voltage	SATA connector	PCIe connector
Molex	ATX 12V 4 pin	direct current	Ohms	current

_____1. What do you call when creating a force there are potential differences in an electrical charge?
_____2. It is an auxiliary connector for additional power if required. This is called_____.
_____ 3. The amount of electricity flowing through an electrical system is called _____.
_____ 4.How does resistance measured?
_____ 5. It is a low voltage of electricity current that the motherboard needed.
_____ 6. It is a 15-pin connector for components used in HDDs, SSDs, and DVD/CD drives.
_____ 7. It is the component that supplies power to the other components in a computer.
_____ 8. It is an eight-pin connector used in graphic cards Ωwill likely be seen on newer model power supplies. This refers to:
_____ 9. This is used as a second connector that goes to the motherboard.
_____ 10. It is the total amount of power needed to operate a component. This refers to:

Activity 2. Directions: Supply the following information. Write your answer in the blank column provided.

Types of connector	Name	Number of pins	Used for
1. 			
2. 			
3. 			
4. 			
5. 			

Activity 3A**.** Directions: Solve the unknown measurement. Write your answer in the space provided.

1. I= 10A R=1500 Ω V=?	2. I =? R= 200Ω V= 240V	3. I= 15A R= ? V= 110V
4.	5.	6.

I= ? R= 20 Ω V= 350V	R=? I= 25A V=110 V	V= ? R= 50Ω I= 15A

Activity 3B. Word Problem. Write your answer and solution on a separate sheet of paper.

1. What is the current in an electrical circuit with a voltage of 120V and 12Ω of resistance?
2. What is the voltage across an electrical circuit with a current of 10A and 200Ω of resistance?
3. What is the resistance in an electrical system with a voltage of 230V and a current of 5A?
4. If I connect a 120V supply to a 60W bulb, what current would flow in the circuit?
5. If a 3V battery is connected to a bulb and a current of 1.5A flows through it then what is the rating(watts) of the bulb?

V. Assessment:

Directions: Multiple choice. Encircle only the letter of the correct answer.

1. What do you call when creating a force there are potential differences in an electrical charge?
   A. current B. resistance C. voltage D. watts
2. It is an auxiliary connectors for additional power if required. This is called_____.
   A. Molex B. PCIe connector C. SATA connector D. 4 pin power connector
3. The amount of electricity flowing through an electrical system is called _____.
   A. current B. resistance C. voltage D. wattage
4. How does resistance measured?
   A. amps B. ohms C. volts D. watts
5. It is a low voltage of electricity current that the motherboard needed.
   A. Alternating current B. direct current C. power supply unit D. voltage

VI. Reflection:

In this modern world, it is important to have a better understanding about power supply. How does it work and how electricity flows in the system. It includes the difference between electric current, voltage, resistance, and electrical power. It can be very useful but it will be also dangerous if not properly calculated.

Remember that if you know any two of the physical values in the formulae circle then you can calculate each of the other two unknown values.

References:

https://www.electronics-tutorials.ws/supplies/power-supplies-for-beginners-part-1.html on 1/18/2021
Layman's Tech: Power Supply units - https://davescomputertips.com/laymans-tech-power-supply-units/on 1/18/2021
https://www.helpwithpcs.com/hardware/power-supply-basics-inc-pinouts.php on 1/19/2021
Images of different types of connectors - https://davescomputertips.com/laymans-tech-power-supply-units/ on 1/18/2021, https://www.computerhope.com/jargon/b/berg.htm on 1/18/2021
Owlcation: How to understand electricity: https://tinyurl.com/y6yfpogd on 1/18/2021

Writer: Mary Ann R. Franco

Validator: Gregorio S. Quineri