LESSON PLAN

School: Samkhok school	**Date**: 27/8/2019	**Time:** 50 minutes	**Grade:** 9
Subject: Physics		**Topic:** Electric Power	

Concept/principle to be demostrated:

This lesson plan shows students how to manipulate a formula to solve equations, using formula of electric power. Knowing how to manipulate a formula by isolating the unknown is as easy as covering the symbol and reading the remaining formula. At the same time, they know how to speak physical quantity in the formula by English.

Learning objectives:

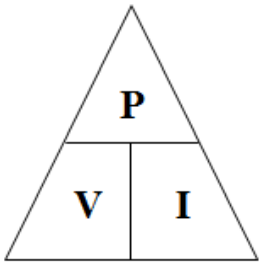
On completion of this lesson, students will be able to:

1. Use formula of electric power to analyse the relationship between voltage, current and power in electrical circuits.
2. Match power abbreviation with their terms.
3. Match terms associated with power and measuremant to their definitions.
4. Demonstrate the ability to
   - understandby applying the formula P=IV to solve problems using a calculator.
   - Determine the power used in resistive circuit and the power tools .
5. State three version of the formula used to compute electric power.

Learning materials:

- Electric power is the rate at which energy used by an elctrical circuit .
- It's measured in term of joules per second (J/s)- a watt (W).

$$P = IV$$



With:

- P: electric power (Watt-W)
- I: current (ampere-A)
- V: voltage (volt-V)

Preparation and resources:

Student will need

- Pencil
- Calculator

Teacher will prepare

- Whiteboard

Learning method

- Question and answer

○ Discussion
Time: The lesson presentation should take approximately 50 minutes.

Timing	Activities
	1. Introduction
3 mins	Move students into the class in an orderly manner.
7 mins	○ Teacher open the lesson by giving greeting and introduct myself. ○ Review Ohm's law with physical quantities in the electricity such as voltage, resistance and current. $V = IR$ ○ The teacher leads the story to the problem and give answer to that question which relate to our lesson.
	2. Components:
20 mins	○ Teacher explains to student how to know about power, energy and electric power and gives some example: ✓ Power is defined as the rate at which energy is transferred. ✓ Energy is basiccally the ability of something to move something else. It can never be created or destroyed, only transferred to the another form . ✓ Electric power is measured by combining both how much electric energy is transferred, and how fast that transfer happens. ○ The teacher presents the unit of electric power- watt in the SI unit. ✓ Energy is measured in terms of joules(J). Since power is as measure of energy over a set amount of time, the SI unit for joules per second is the watt. ✓ Draw the following on the board: $watt = W = \frac{joule}{second} = \frac{J}{s}$ ✓ Teacher provides some rules for unit conversion of watt. ○ The teacher asks student: " How could we calculate power in the circuit?" ○ Draw on whiteboard the formula of electric power : $P = IV$ ✓ Demonstrated the relationship between V, I, P. ✓ Also demonstrated how the " calculation triangle" can be used to work out problems. ✓ Show students how easy the formula is to use by covering the desired value and solving the equation. ○ Example questions: work through first example using a single resistor connected to a voltage source and calculate the current being drawn and the power being consumed with the class. ✓ If A 9V battery connect across a 10Ω resistor. How do we calculate the power across the resistor?" ▪ First, we use Ohm's law to find the current running : $I = \frac{V}{R} = \frac{9V}{10\Omega} = 0.9\ (A)$ ▪ Then, use the formula for electric power: $P = IV = 0.9x9 = 8.1\ (W)$

15 mins	○ Organize students to playing game: (Lucky number and find the code) ✓ Teacher explains to the students how to play that games. ✓ Devide the class into 2-3 groups. ✓ Students play games and collect score. ✓ The winner of game have a big gift from teacher.
	3. Conlusion
5 mins	○ Congratulation students on good work ethic (or not) and re-iterate what they have learned. ○ Teacher presents the lesson plan at next time and ends the lesson by saying greeting.

GAME: LUCKY NUMBER

1. ***Rule of game***
   - There are 2 teams playing. Each team will choose a lucky number.
   - There are 12 numbers, behind each number is the question or reward of the corresponding lucky number.
   - If the correct answer is 10 points, if the wrong answer is not scored and the other team has the right to answer. Each team can only answer 1 time per turn.
   - Give students the paper to record the answers.
   - The game consists of 8 numbers containing exercise questions and 4 lucky numbers.
2. ***The numbers in game***
   - ✓ *Number 1:* Lucky number – 20 points
   - ✓ *Number 2:* Match the terms to the correct definition- 30 points

1. Electric power	A. 1,000 watts
2. Watt	B. The unit of measurement for power
3. Kilowatt	C. Energy, in kilowatts, multiplied by the time in hours
	D. The rate at which energy used by an elctrical circuit

⇨ Answer: 1-D, 2-B, 3-A

   - ✓ *Number 3:* (10 points) Solve for unknown power when V= 8 volts and I= 2 amperes. P=……
     A. 16 W
     B. 0.16 W
     C. 4 W
     D.0.4 W
   - ✓ *Number 4*: (10 points) Solve for unknown voltage when P= 30 watts and I= 2 amperes. V=…….
     A. 60 V
     B. 0.6 V
     C. 15 V
     D. 1.5 V
   - ✓ *Number 5*: Lucky number- 10 points
   - ✓ *Number 6:* Lucky number- 20 points
   - ✓ *Number 7:* (10 points) Solve for unknown intensity when P= 50 watts and V= 10 volts. I=……..
     A. 5 A
     B. 0.5 A
     C. 500 A
     D. 0.05 A
   - ✓ *Number 8:* (10 points) Solve for unknown power when V= 230 volts and I= 0.1 amperes. P=……
     A. 0.23 W
     B. 23 W
     C. 0.023 W
     D. 2300 W

- ✓ *Number 9*: (10 points) Solve for unknown voltage when P= 180 watts and I= 10 amperes. V=…….
  - A. 1.8 V
  - B. 1800 V
  - C. 18 V
  - D. 180 V
- ✓ *Number 10*: Lucky number- 10 points
- ✓ *Number 11*: (10 points) The formula of elctric power is
  - A. $P = IV$
  - B. $P = \frac{I}{V}$
  - C. $P = \frac{V}{I}$
  - D. $I = \frac{P}{V}$
- ✓ *Number 12*: (10 points) The unit of measurement for power is
  - A. voltage
  - B. ampere
  - C. watt
  - D. ohm

GAME: FIND THE CODE

- Use the numbers that appear in the answer of the lucky number game (questions in numbers 3,4,7,8,9) and the decoding board to find the keyword " P O W E R"
- The decoding board (this is a suggestion for students if they can't to find the answer)

A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
1	2	3	4	5	6	7	8	9	10
K	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**
11	12	13	14	15	16	17	18	19	20
U	**V**	**W**	**X**	**Y**	**Z**				
21	22	23	24	25	26				

⇨ P, O, W, E, R – 16, 15, 23, 5,18