

Intermediate Science 9

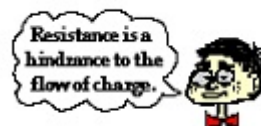
Unit 3: CURRENT ELECTRICITY

WORKSHEET 3: ELECTRICAL RESISTANCE



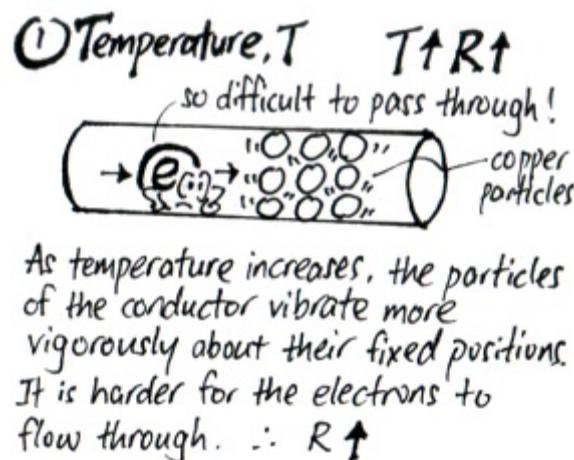
Resistance:

- Is the property of any material that slows down the flow of electrons and converts electrical energy into other forms of energy.
- Resistance is measure in ohms (Ω). The symbol for ohm is an omega .
- Resistance is like an obstacle in the road. Electrons like to going to places of least resistance.
- Resistance (R)is the opposition to the flow of an electric current, causing the electrical energy to be converted to thermal energy or light.

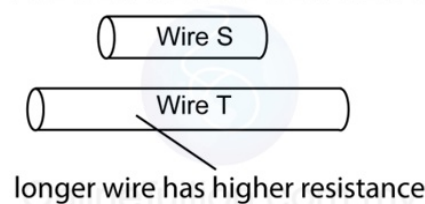


FOUR FACTORS THAT AFFECT RESISTANCE:

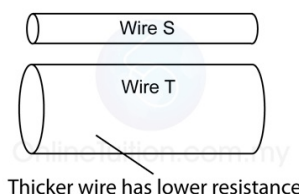
- 1) Temperature: of wire
 - Higher the temperature, larger is the resistance



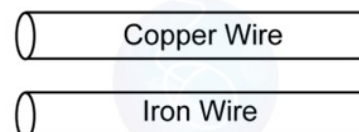
- 2) Length of wire
 - longer the wire greater will be the resistance and shorter the wire smaller will be the resistance.



3. Thickness of wire
 - Thinner the wire, greater the resistance and thicker the wire, lower the resistance.



4. Type of material in the wire
 - Good conductors have low resistivity.
 - Silver and copper are extremely good conductors. Glass and hard rubber are non-conductors or insulators.



Iron wire has higer resistance

Electric load provided resistance in a circuit. It transforms electrical energy into other forms of energy.

Examples:



PART A: MULTIPLE CHOICE

1. Which of the following best describes resistance?
 - (A) Property of any material that slows down the flow of electrons
 - (B) Property of any material that increases the flow of electrons
 - (C) Property of any material that causes the flow of electrons to be unchanged
 - (D) Property of any material that causes the flow of electrons to stop

2. Which of the following is true for electric resistance?
 - (A) Increases the flow of electrons
 - (B) Converts electrical energy into other forms of energy
 - (C) Decreases with an increase in temperature
 - (D) Measured in joules

3. What are the units for resistance ?
 - (A) Ampere
 - (B) Ohms
 - (C) Joule
 - (D) Volt

4. What is the symbol for resistance?
 - (A) A
 - (B) V
 - (C) Ω
 - (D) J

5. Which of the following terms refers to the slow down in the flow of electrons?
 - (A) Charge
 - (B) Voltage
 - (C) Resistance
 - (D) Current

6. What feature of a river is most similar to resistance in an electric circuit?
 - (A) The speed of water flow measured in metres per second
 - (B) The vertical drop between two points along the river measured in metres
 - (C) The volume of water moving past a point measured in litres per second
 - (D) The width of the river measured in metres

7. A battery is connected to a resistor. Increasing the resistance of the resistor will
 - (A) increase the current in the circuit
 - (B) decrease the current in the circuit
 - (C) not affect the current in the circuit
 - (D) always cause the current to stop flowing

8. A battery is connected to a resistor. As charge flows, the chemical energy of the battery is dissipated as
- (A) Current
 - (B) Voltage
 - (C) Charge
 - (D) Thermal energy
9. The resistance of a wire depends on
- (A) Length
 - (B) Material
 - (C) Cross section area
 - (D) All of the above
10. What happens to resistance as the temperature increases?
- (A) Stays the same
 - (B) Goes to zero
 - (C) Decreases
 - (D) Increases
11. Which of the following would act as a resistor in a circuit?
- (A) Load
 - (B) Source
 - (C) Conductor
 - (D) Control

PART B: WRITTEN RESPONSE

1. A) What is resistance?

- B) What are the units of electrical resistance?

- C) What does it mean when we say that energy is “lost” in a resistor?

- D) List the four factors that affect resistance in a wire.

2. Which wire has the greatest resistance? Explain your answer

