

Electrical Energy (p. 207 – 213)

I. Series & Parallel Circuits

1. What are the three components of an electrical circuit?

1. Source (Battery or outlet) 2. Devices (appliances etc.) 3. Conductors (wires)

2. What are the two types of circuits?

1. Series Circuit 2. Parallel Circuit

3. Define the term series circuit.

Series Circuit – circuit in which electric current has only one path to follow

4. List three uses of series circuits.

1. Flashlights 2. Christmas Lights 3. Watches

5. What is the difference between an open and closed circuit?

Open = Circuit is disconnected; (no current flows)

Closed = Circuit is completely connected (constant current flow)

6. Define the term parallel circuits.

Parallel Circuits – circuit in which electric current has more than one path to follow

7. List three uses of parallel circuits.

1. Houses 2. Automobiles 3. Electrical Systems

8. Which type of circuit causes the circuit to be entirely opened (and shut down)?

Circle One :

Series

Parallel

One goes out, the rest go out!

II. Household Circuits

1. Where do most parallel circuits branch from in a house?

Circuit Breaker or Fuse Box

2. If many appliances or electrical devices are plugged in, what could happen to the wires?

↑ Current = ↑ Heat = Insulation on wires melt = FIRE!!!

Electrons

Neg → Pos.

Current

Pos → Neg.

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3. What are two devices that protect a house from electrical overload?

1. Circuit Breaker 2. Fuse Box

4. Explain how a fuse prevents current overload in a circuit.

- A wire in the center of the fuse melts, which stops the flow of charge in the circuit.

5. How does a circuit breaker create an open circuit and stop a current?

1. A piece of metal bends when current increases + gets hot
 2. Bending causes a switch to flip + open the circuit

III. Electric Power

1. Why is electrical energy so useful?

- Converted easily into other types of energy

2. Define the term electric power.

Electric Power - rate at which electrical energy is converted to another form of energy

3. Which type of appliances typically requires more electrical power?

Appliances with electrical heating elements (ovens, hair dryers, furnace, AC)

4. What is the SI unit for electrical power? Watts (W)

How is electrical power normally measured (what units)? kilowatts (kW)

5. Write out the equation used to determine electric power.

$P = I V$

Electric Power = Current x Voltage
 (watts) (amperes) (volts)

6. Electric bills are based on electric power used.

Circle One : True False

7. Write out the equation used to determine electrical energy.

$E = P t$

Electrical Energy = Electric Power x Time
 (kWh) (kW) (hrs)

8. How is the cost of an appliance calculated?

Multiply electrical energy by charge for each kilowatt
 ↳ Determined by power company

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A Christmas Story

Other Devices
 - 3-prong plug with ground wire
 - GFCI outlet

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Electric Power
 - Light Bulb (60-100 watts)
 - Microwave (1,000 watts)
 - Hair Dryer (1,875 watts)
 - Dryer (5,400 watts)
 - Stove (6,000 watts)

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