Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 61

Power supply, conduction, insulation and protection

ST

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Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- An electrical function is *the role that a component plays in the control or transformation of electric current.*
- Power supply is *the electrical function performed by any component that can generate or provide an electric current in a circuit.*
- Conduction is *the electrical function performed by any component that can transmit electric current from one part of a circuit to another.*
- Insulation is *the electrical function performed by any component that prevents an electric current from flowing.*
- Protection is *the electrical function performed by any component that can automatically cut current flow in the event of a power surge.*

How two protective devices work

Fuse	Breaker
The electric current crosses the fuse through a conductive filament. If the current intensity exceeds a certain level, the filament melts and breaks, preventing the current from flowing through the fuse.	*In some breakers, the current passes through a bimetallic strip. When the current intensity exceeds a certain level, the strip becomes hot, it bends, and the connection is broken. A switch is thrown to restore circuit operation. Other breakers use an electromagnetic mechanism.*

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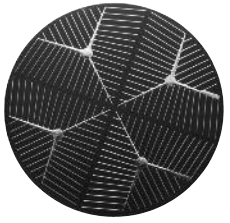
Various power supplies

Source	Description	Advantages	Disadvantages
 Battery	*The battery (technically, an electrochemical cell) is a device that transforms the energy from a chemical reaction into electrical energy.*	• *Appliances that run on batteries are portable.*	• *Batteries must be replaced after a certain time.* • *When people throw out used batteries, the cells can contaminate the environment by leaking heavy metals.*
 Electrical outlet	*An outlet is designed to receive the prongs of an electric plug. The outlet contains contacts and is permanently connected to an electrical network.*	• *Electrical outlets are a stable and long-lasting power supply.* • *They generate very little greenhouse gas when supplied by hydroelectric dams, as in Québec.*	• *The construction of hydroelectric dams causes flooding of vast areas of land.* • *Appliances cannot be moved far from wall outlets.* • *Appliances stop working in the event of a power cut.*
 Photovoltaic cell	*The photovoltaic cell (often called a solar cell) is an electronic device that generates an electric current when exposed to light.*	• *Photovoltaic cells can be used in isolated areas.* • *They can power portable or mobile devices.* • *They do not cause greenhouse gas emissions.* • *They have a life span of 20 to 30 years.*	• *Their operation depends on sunny conditions.* • *They are much more expensive to install than other sources of power.*