WARM UP-

Energy A	Energy stores within a particle (measured by the particle's temperature).
Energy B	Energy generated by the sun.
Energy C	Energy released when particles react to form a new substance.
Energy D	Energy created by the motion and position of an object.
Energy E	Energy that flows through a circuit.

1. The type of energy described by Energy C is which type of energy?

a. electrical energy

b. chemical energy

c. mechanical energy

d. heat energy

2. Billy is clapping his hands. Every time he moves his hands together he is expending mechanical energy. This type of energy is described by which item on the above list?

a. Energy C

b. Energy B

c. Energy D

d. Energy A

1

WARM UP-

Energy A	Energy stores within a particle (measured by the particle's temperature).
Energy B	Energy generated by the sun.
Energy C	Energy released when particles react to form a new substance.
Energy D	Energy created by the motion and position of an object.
Energy E	Energy that flows through a circuit.

1. Energy B describes solar energy. Which of the following is the best example of solar energy being used?

a.driving a nail into a board with a hammer

b. starting a fire with a magnifying glass instead of matches

c. causing vinegar to fizz by adding baking soda

d. using a vacuum cleaner that is plugged into the wall

2

WARM UP-

1. **Potential energy is transformed into kinetic energy in which of the following scenarios?**

a. Scenario B b. Scenario D

c. Scenario C d. Scenario E

2. **By plugging in the stove in scenario D, a person is hoping to create heat energy from what?**

a. electrical energy b. chemical energy

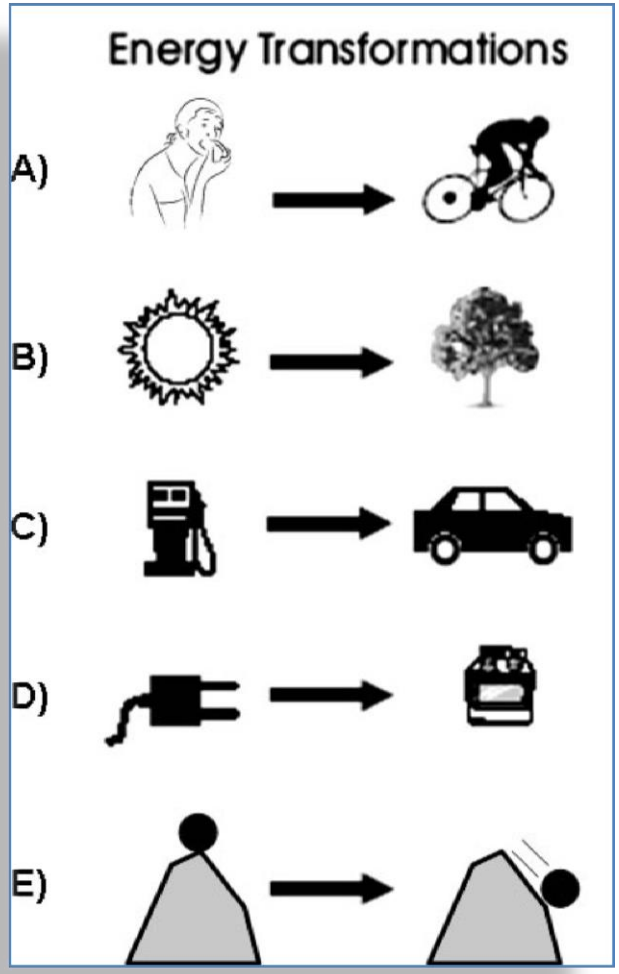
c. solar energy d. mechanical energy

3. **In all of the energy transformations shown above, the total amount of energy:**

a. disappeared when it transformed into another type of energy.

b. decreased when it transformed into another type of energy.

c. remained the same when it transformed into another type of energy.



WARM UP-

1. **Scenario B shows a plant using photosynthesis to create its own food. This involves which of the following energy transformations?**

a. solar energy to kinetic energy

b. solar energy to mechanical energy

c. solar energy to chemical energy

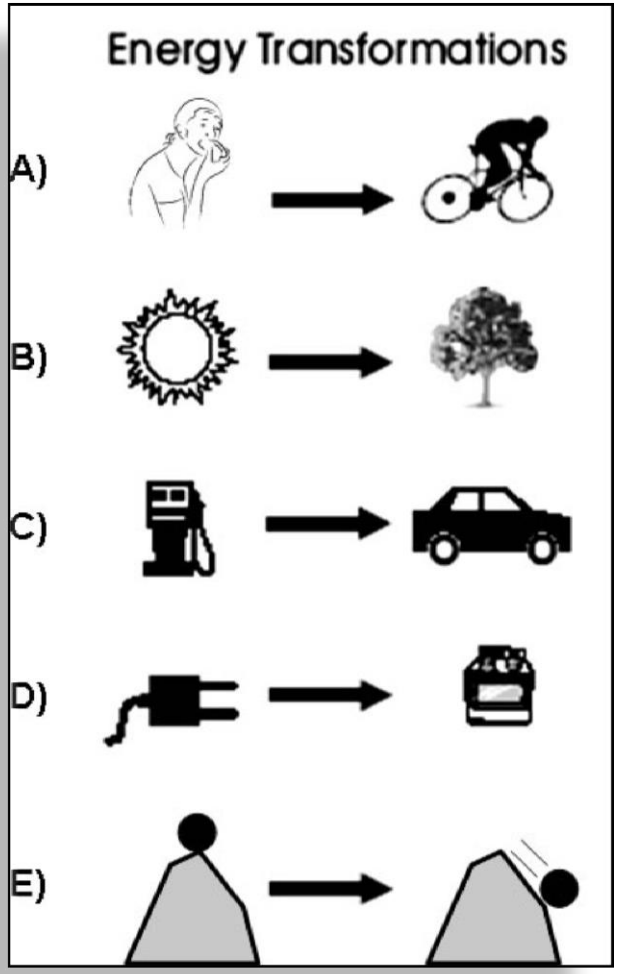
2. **Scenario A above shows a man eating a hot dog so that he has enough energy to complete a bike race. By doing this, he is converting chemical energy to mechanical energy. This same transformation can be seen in which other scenario?**

a. Scenario B

b. Scenario C

c. Scenario D

d. Scenario E



WARM UP-

1. **A simple motor can create electricity by using the properties of magnets. The purpose of this motor is to transform the electrical energy into what?**

a. mechanical energy b. solar energy

c. potential energy d. chemical energy

2. **The picture above shows an electrical wire wrapped around an iron core. This results in which of the following?**

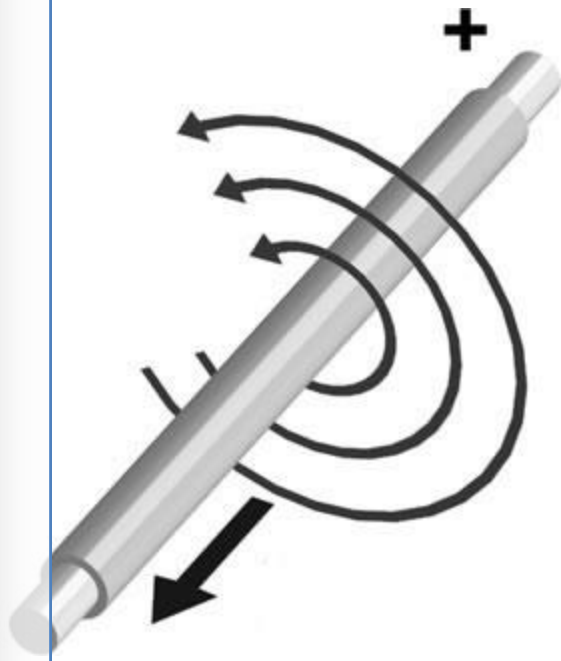
a. a bar magnet. b. a permanent magnet.

c. an electromagnet. d. a molecular magnet.

3. **The picture above shows a coil of wire wrapped around an iron core. This combination creates electricity when it is quickly rotated around a magnet. This device is known by what name?**

a. an insulator b. a conductor

c. a generator d. a transmitter



WARM UP-

1. **When it becomes part of an electrical circuit, which of the following items demonstrates how electricity can be converted into mechanical motion?**

a. Television b. ceiling fan

c. Fireplace d. telephone

2. **The temperature inside the room is about 20 degrees Celsius. However, it is snowing outside and the temperature is below 0 degrees Celsius. The reason why the people inside the house are able to stay warm is because they have transformed chemical energy into**

a. kinetic energy b. thermal energy

c. mechanical energy d. chemical energy

A Typical Family Room

WARM UP-

A Typical Family Room

1. **When it becomes part of an electrical circuit, which of the following items has the ability to transform electricity into sound?**

a. Television b. ceiling fan

c. light bulb d. dog whistle

2. **The light bulb in the above room turns on by the flick of a switch. Which of the following explains why this happens?**

a. the light bulb is heated until it starts to give off light

b. the light bulb is connected to a circuit that allows electrical energy to flow through it

c. the light bulb is the site of a chemical reaction that produces light

d. the light bulb is rotated so that mechanical energy is created

WARM UP-

1. **When a force causes a change in the position of an object (like in Scenarios B and C), it is true that which of the following has also taken place?**

a. energy has been transferred

b. energy has been created

c. energy has been taken away

d. energy has stored

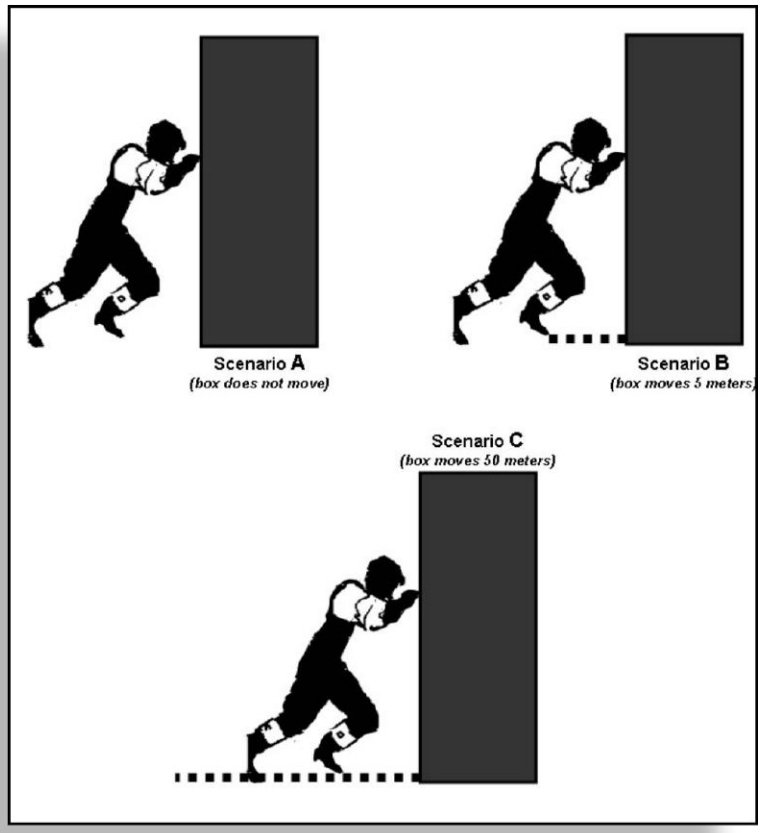
2. **In which of the above scenarios does the man do the most mechanical work (defined as force exerted over a distance)?**

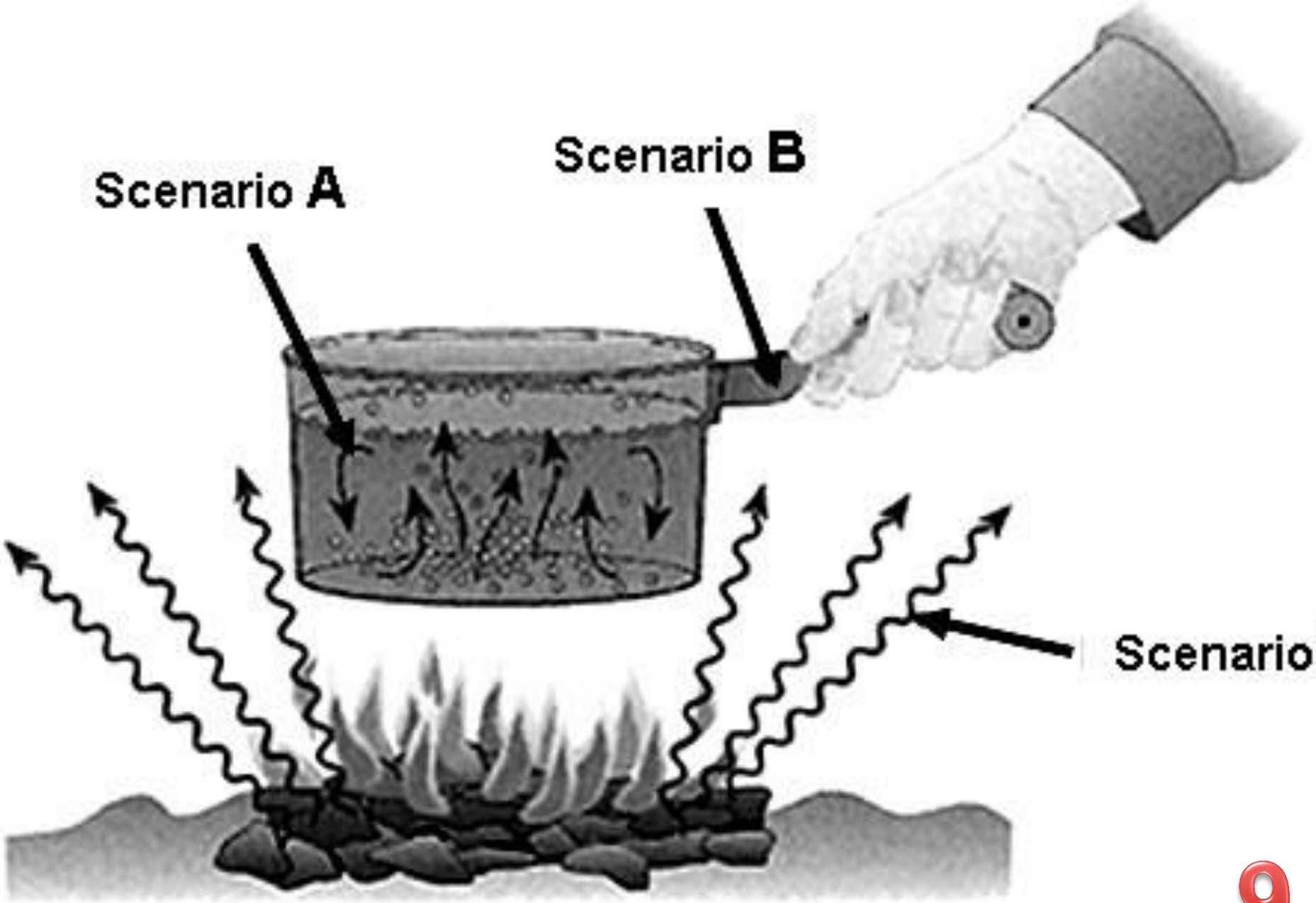
a. Scenario C

b. The man does the same amount of work in each scenario

c. Scenario A

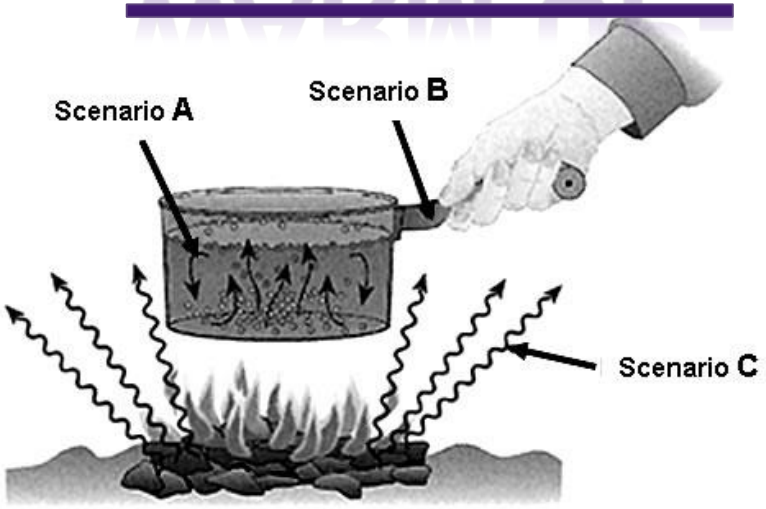
d. Scenario B





Transfer of Heat Energy

WARM UP-



Transfer of Heat Energy

1. **Scenario A shows that water can be heated to a boil when it is held over a fire. This is an example of which type of heat transfer?**

a. Insulation b. radiation

c. Conduction d. Convection

2. The squiggly lines coming from the fire (Scenario C) are used to represent radiation. Which of the following is the best way to describe the term "radiation" in heat transfer?

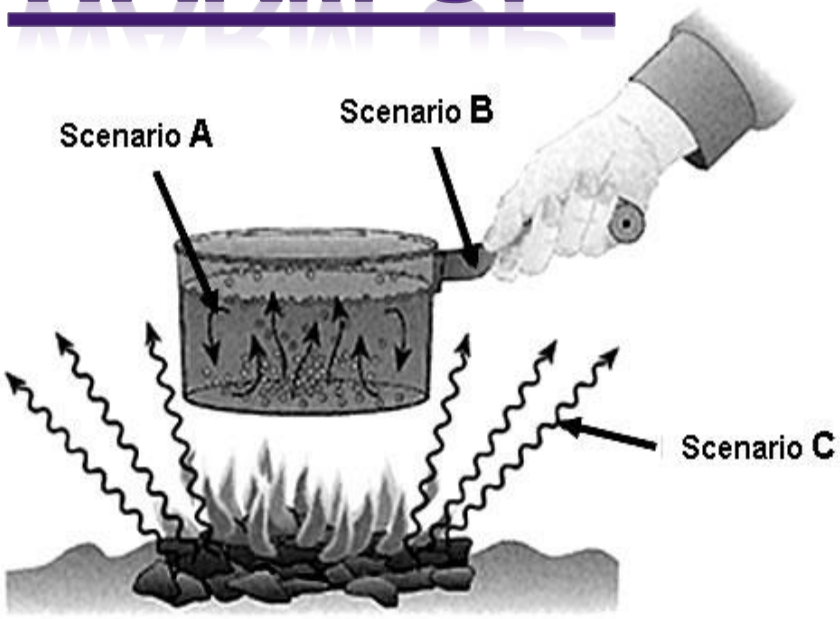
a. the transfer of heat through the direct contact of heated particles

b. the transfer of heat from an area of lower temperature to an area of higher temperature

c. the transfer of heat without the help of heated particles

d. the transfer of heat through the movement of heated particles, but without direct contact

WARM UP-



Transfer of Heat Energy

1. If the man in the above picture touched the side of the hot pot with his cold hand, the heat energy would flow in which direction?

a. the energy would transfer from the hot pot to the man's cold hand

b. the heat energy would not transfer

c. the energy would transfer from the man's cold hand to the hot pot

d. the heat energy would transfer to whichever object had the largest mass

2. The type of transfer shown by Scenario B is known as conduction. In this situation, the man's hand gets hot because:

a. the handle of the pot is acting as an insulator.

b. he is holding his hand close to the fire.

c. he is holding onto the hot handle of the pot.

d. the water is boiling and blowing hot steam onto his hand.

WARM UP-

1.All of the tools above rely on simple machines to complete a task. These simple machines do which of the following?

a.reduce the distance that an object needs to be moved

b. reduce the force needed to move an object over a distance

c. reduce the amount of work needed to move an object over a distance

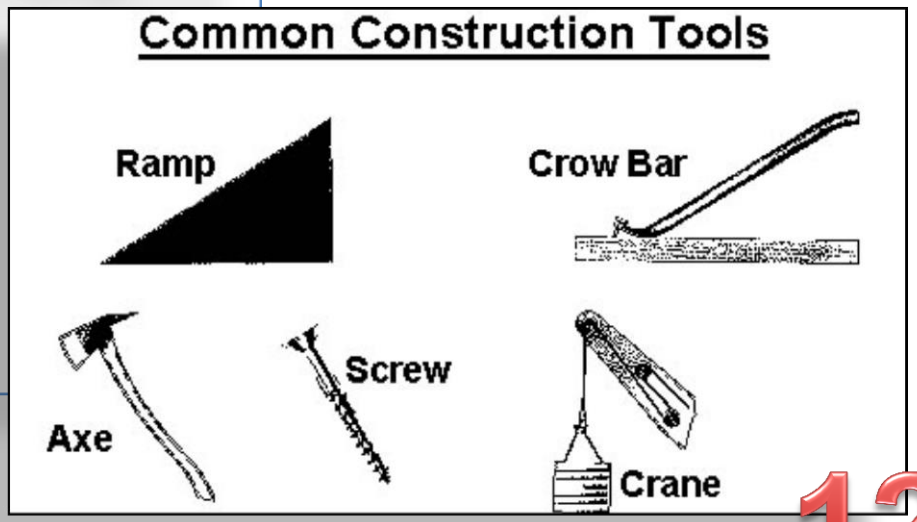
2. If an object is too heavy to move up a ramp, the best way to fix the problem?

a. increase the length of the ramp

b. increase the slope of the ramp

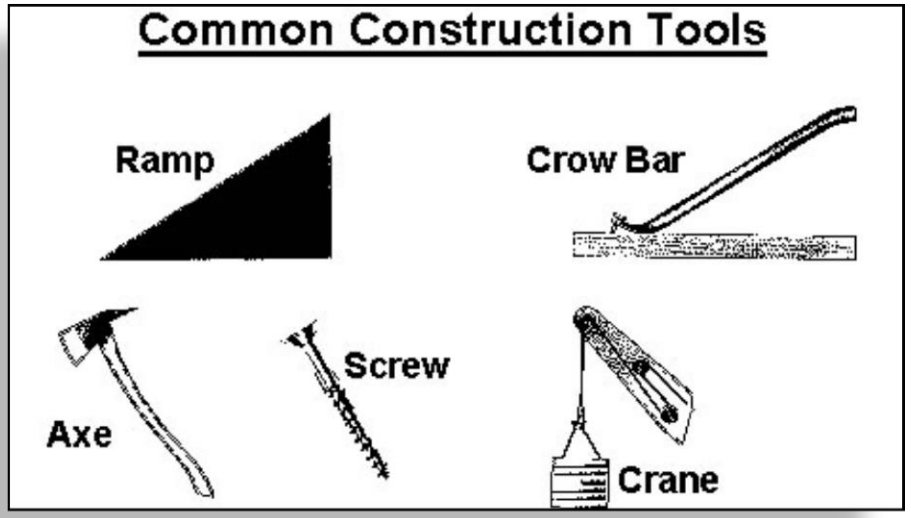
c. increase the friction on the ramp

d. increase the elevation of the ramp



WARM UP-

1. When lifting a heavy object, the crane relies on which of the following simple machines to make the job easier?



a. a lever

b. an inclined plane

c. a pulley

d. a wedge

2. Which of the above tools relies on a lever to reduce the amount of effort needed to complete a task?

a. the axe b. the crane

c. the screw d. the crow bar

WARM UP-

1. Which of the following simple machines is used to help the can-opener revolve around the top of the can while opening it?

a. lever

b. inclined plane

c. wheel and axle

d. pulley

2. Because it uses several simple machines to complete its task, the can opener can be referred to as what?

a. advanced machine

b. combination machine

c. utility machine

d. compound machine

3. To puncture the can, the can-opener relies on a sharp wedge. This wedge is a variation of which simple machine?

a. wheel and axle

b. inclined plane

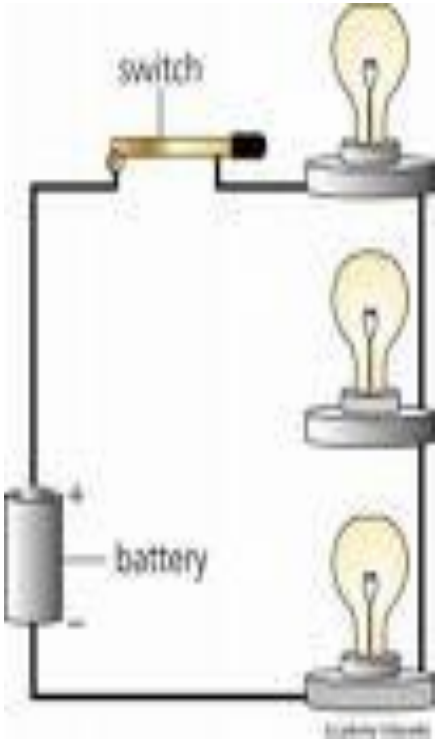
c. lever

d. pulley

WARM UP-

Copy and label the diagrams into your notebooks.

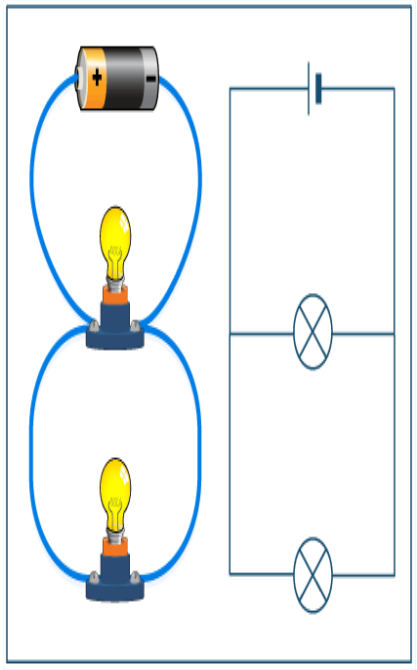
Series Circuit



Cool Stuff:

Stronger current

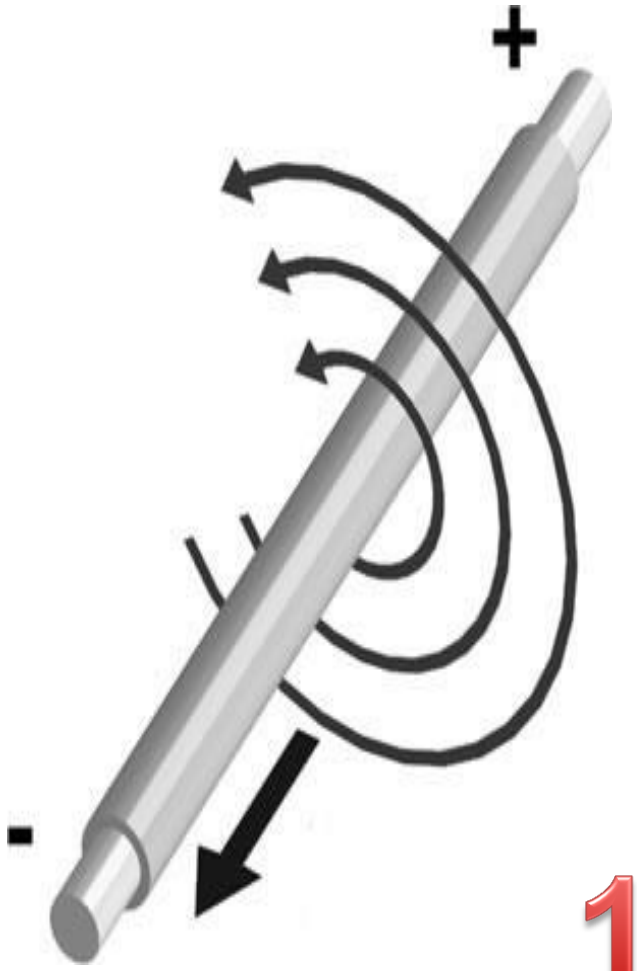
Parallel Circuit

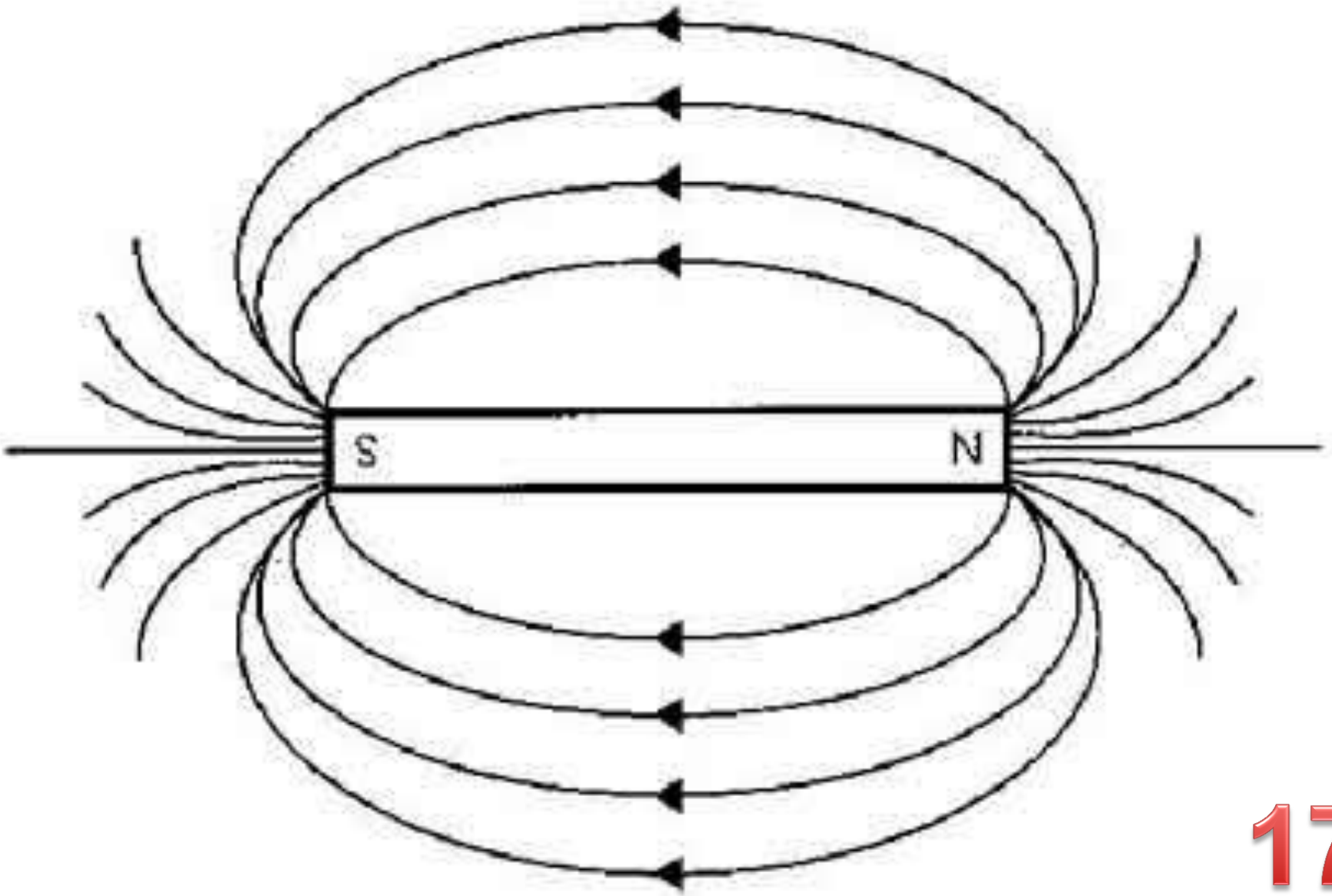


Cool Stuff:

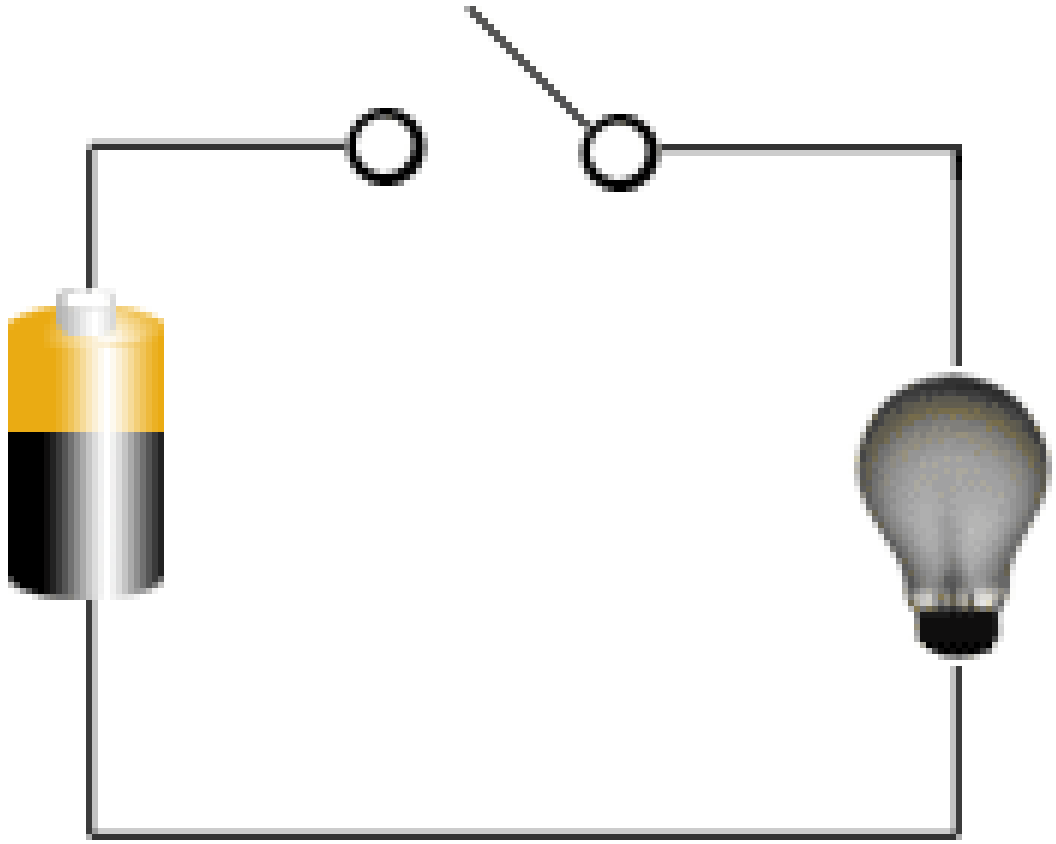
Multiple pathways

Electromagnet

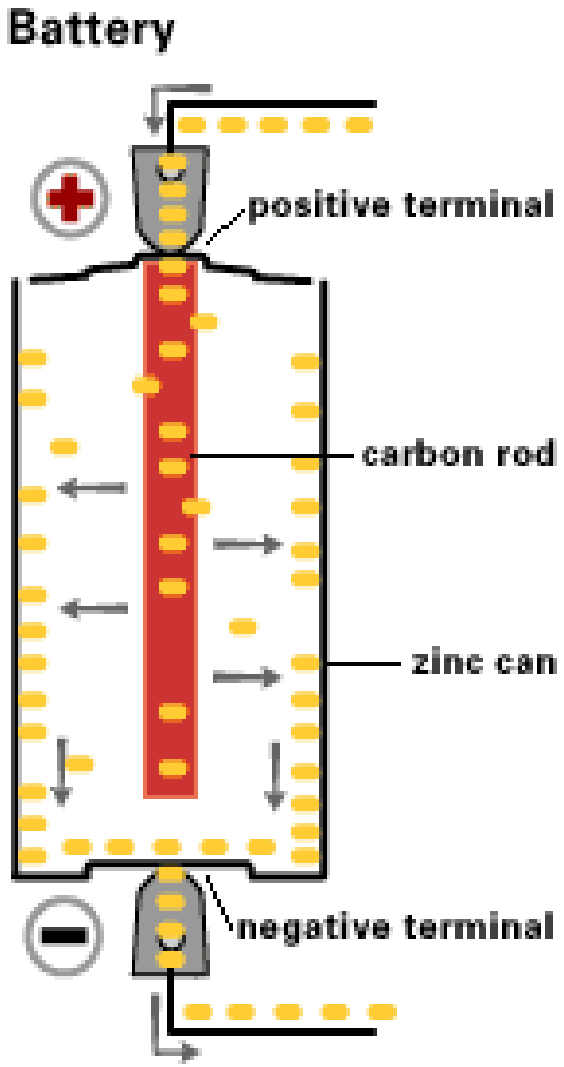


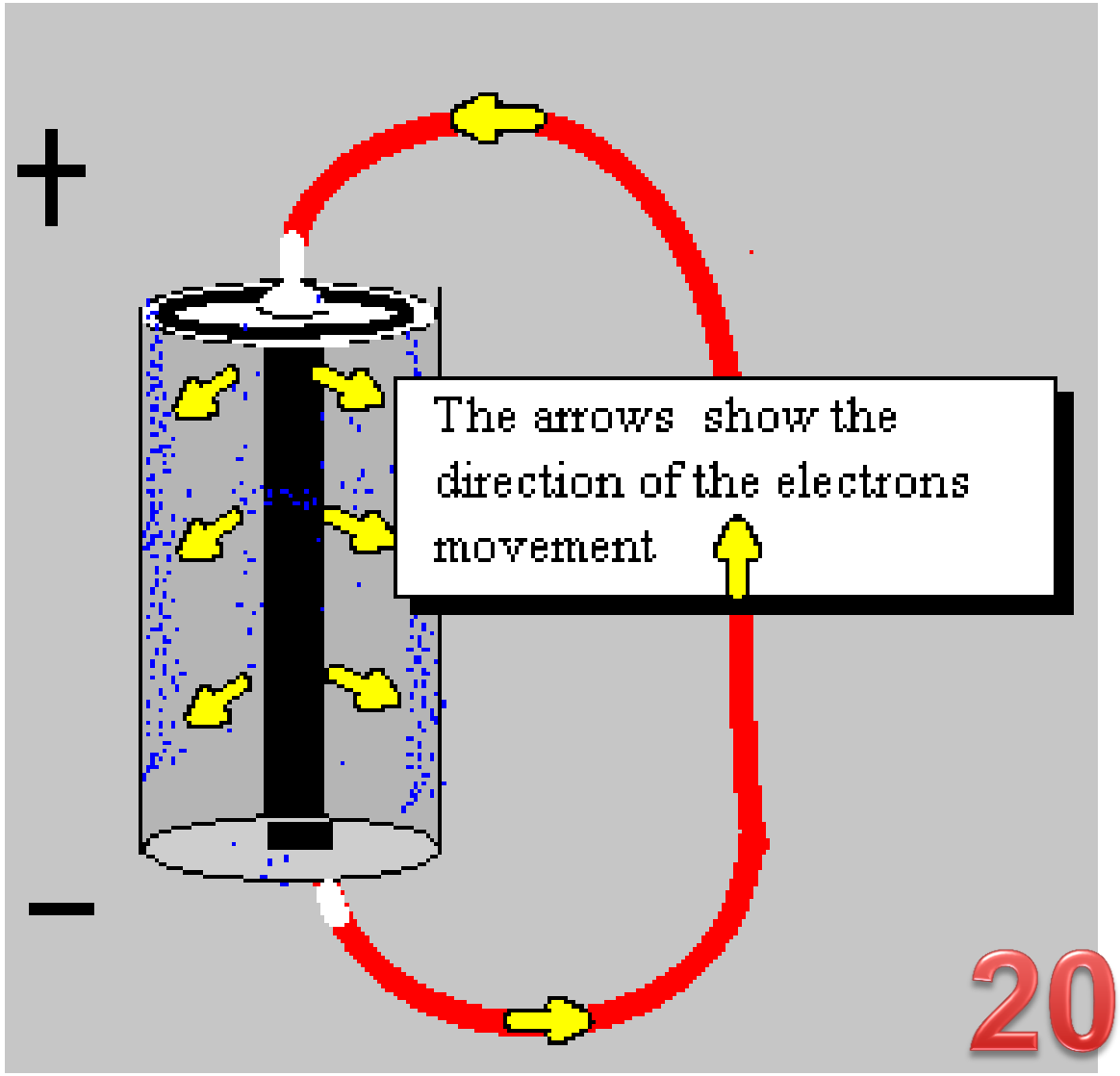

S
N

Coil of Wire

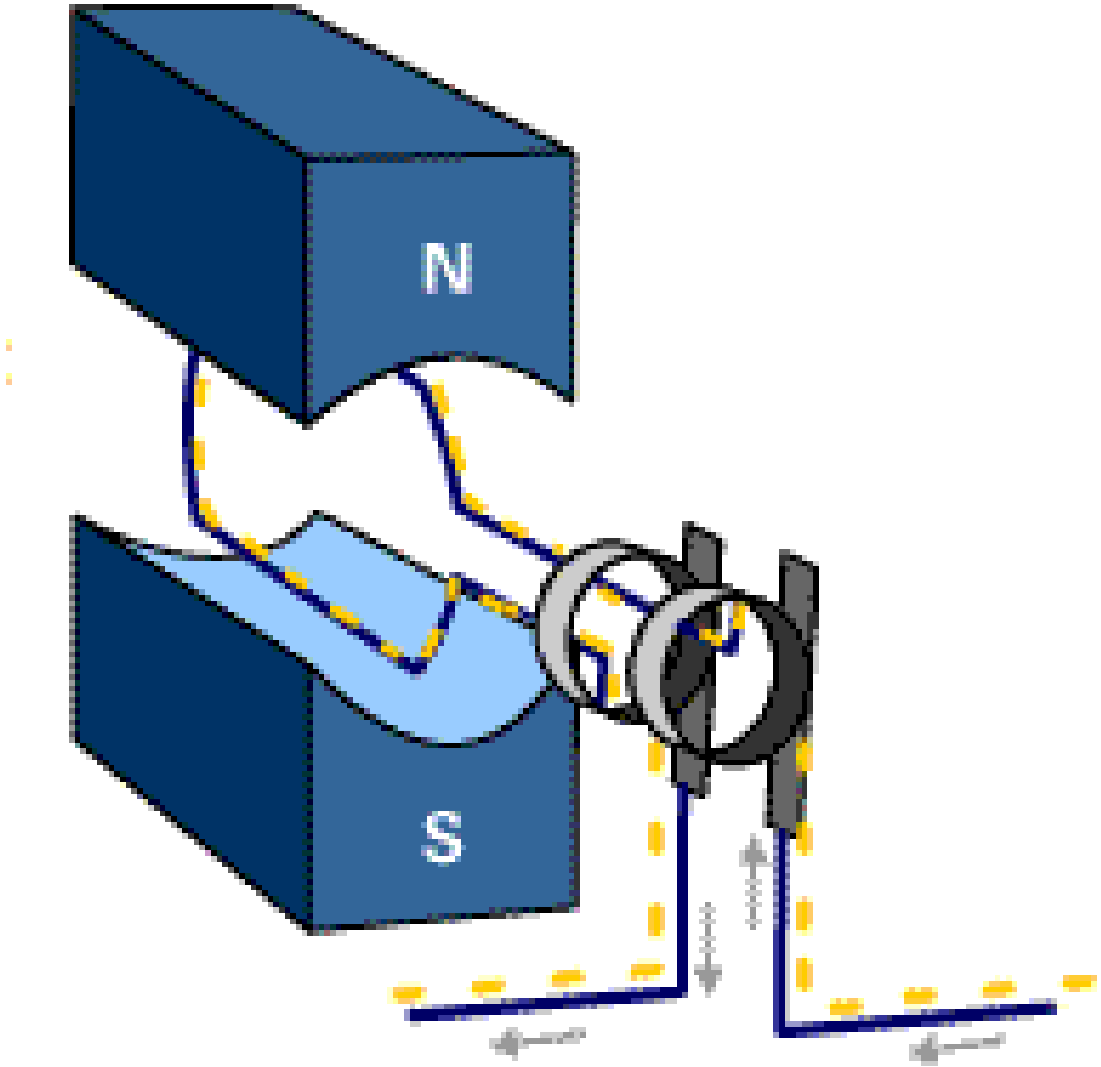


Batteries

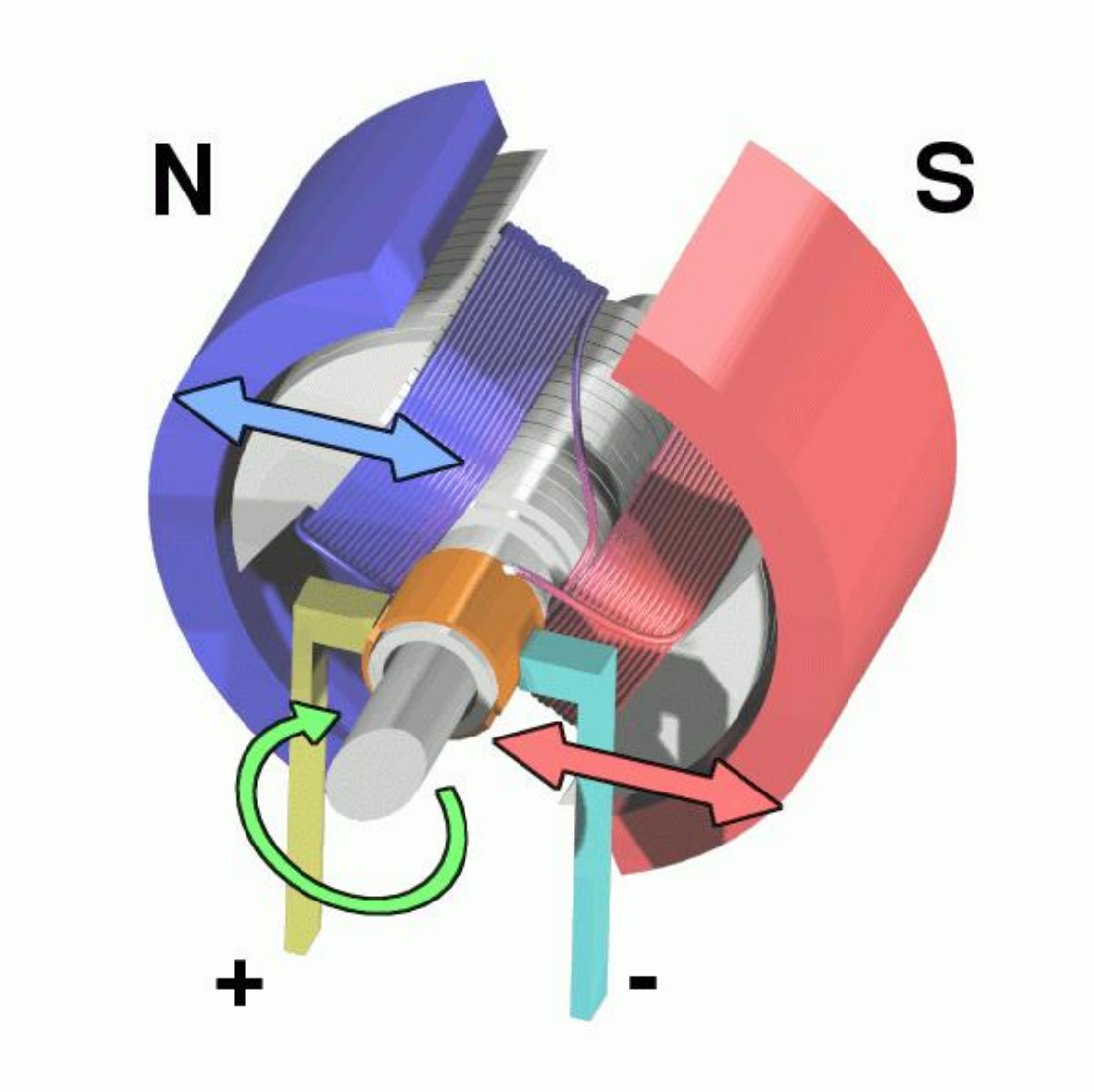

Battery
positive terminal
carbon rod
zinc can
negative terminal

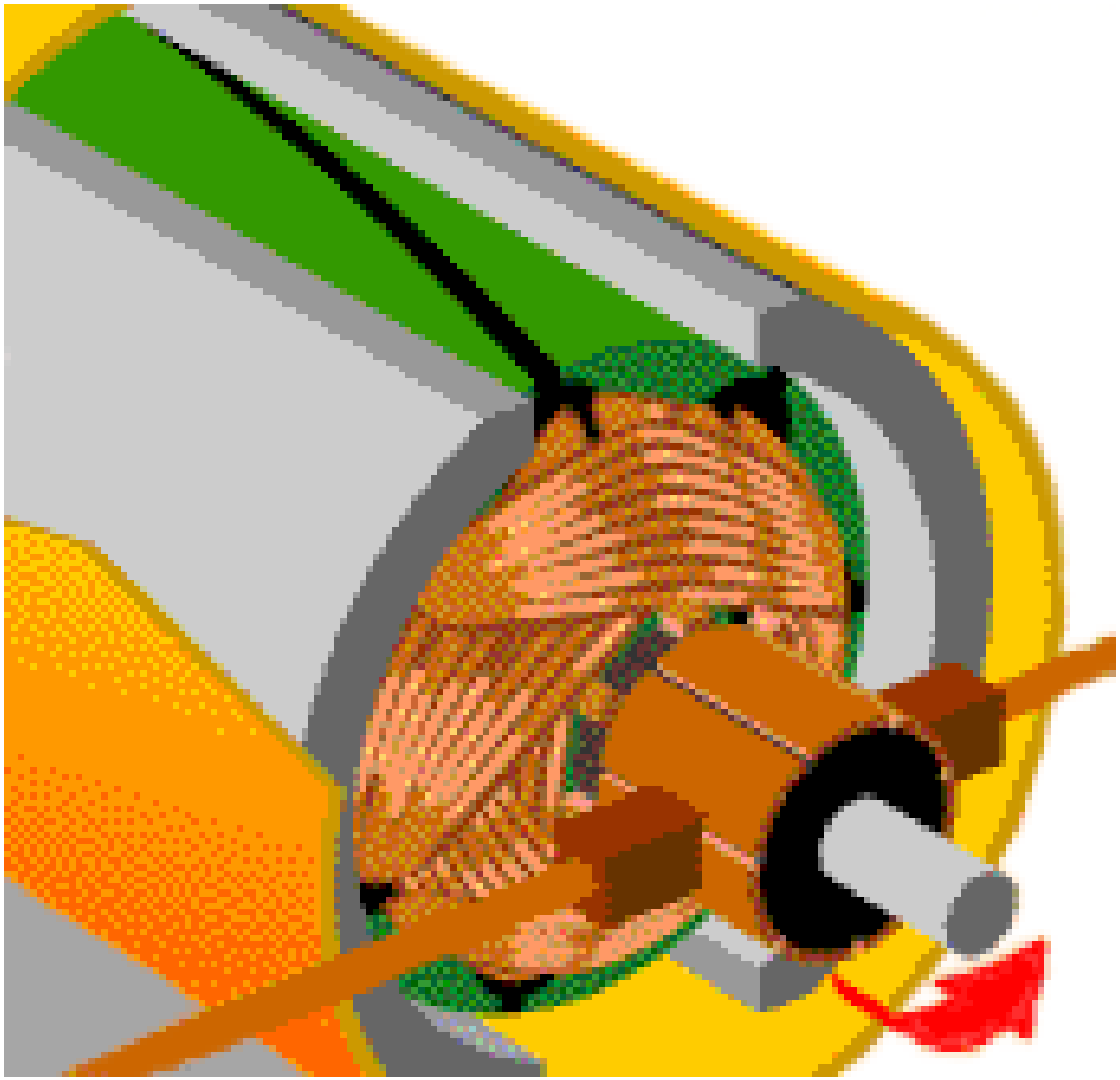

+
−
The arrows show the direction of the electrons movement

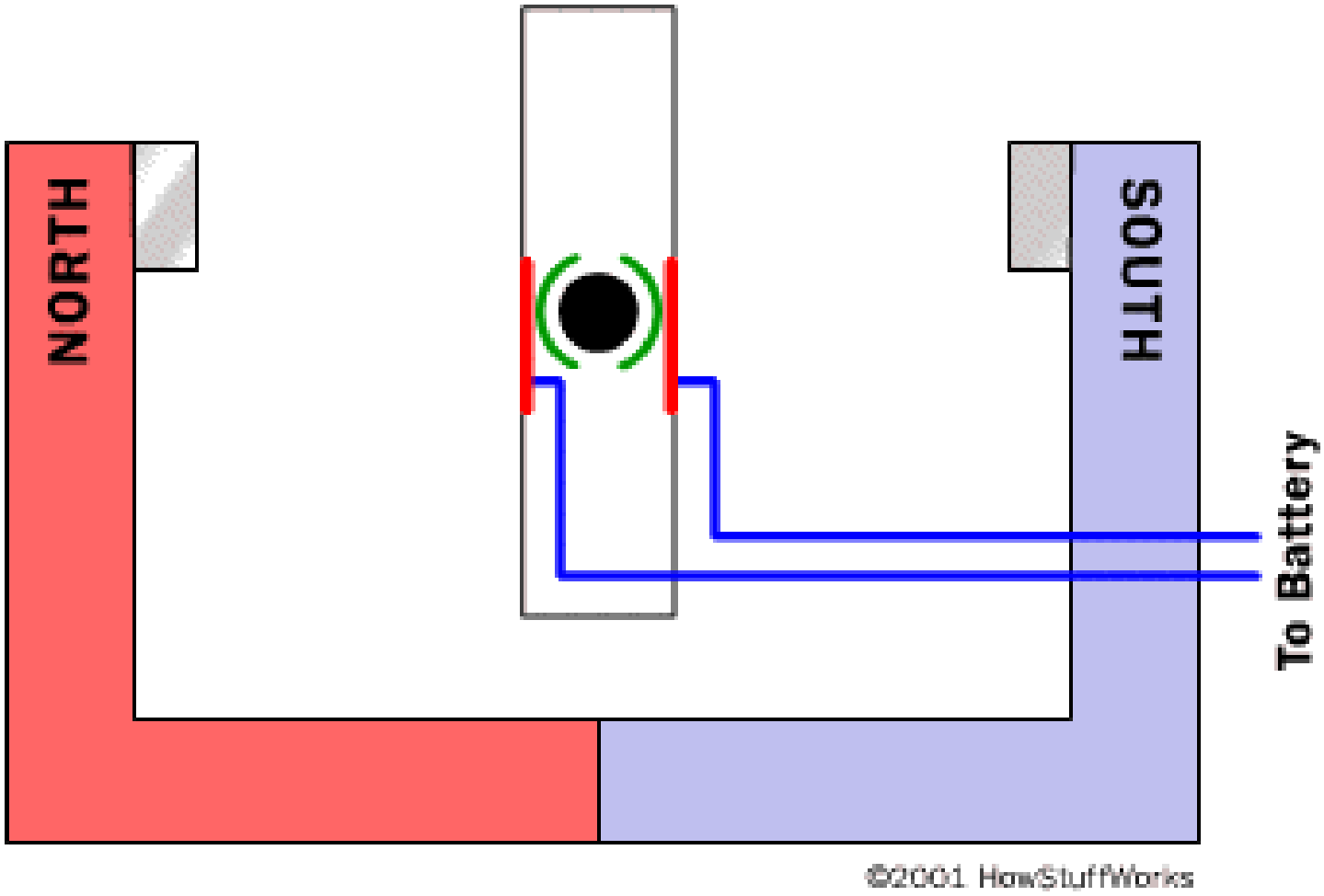
Generator



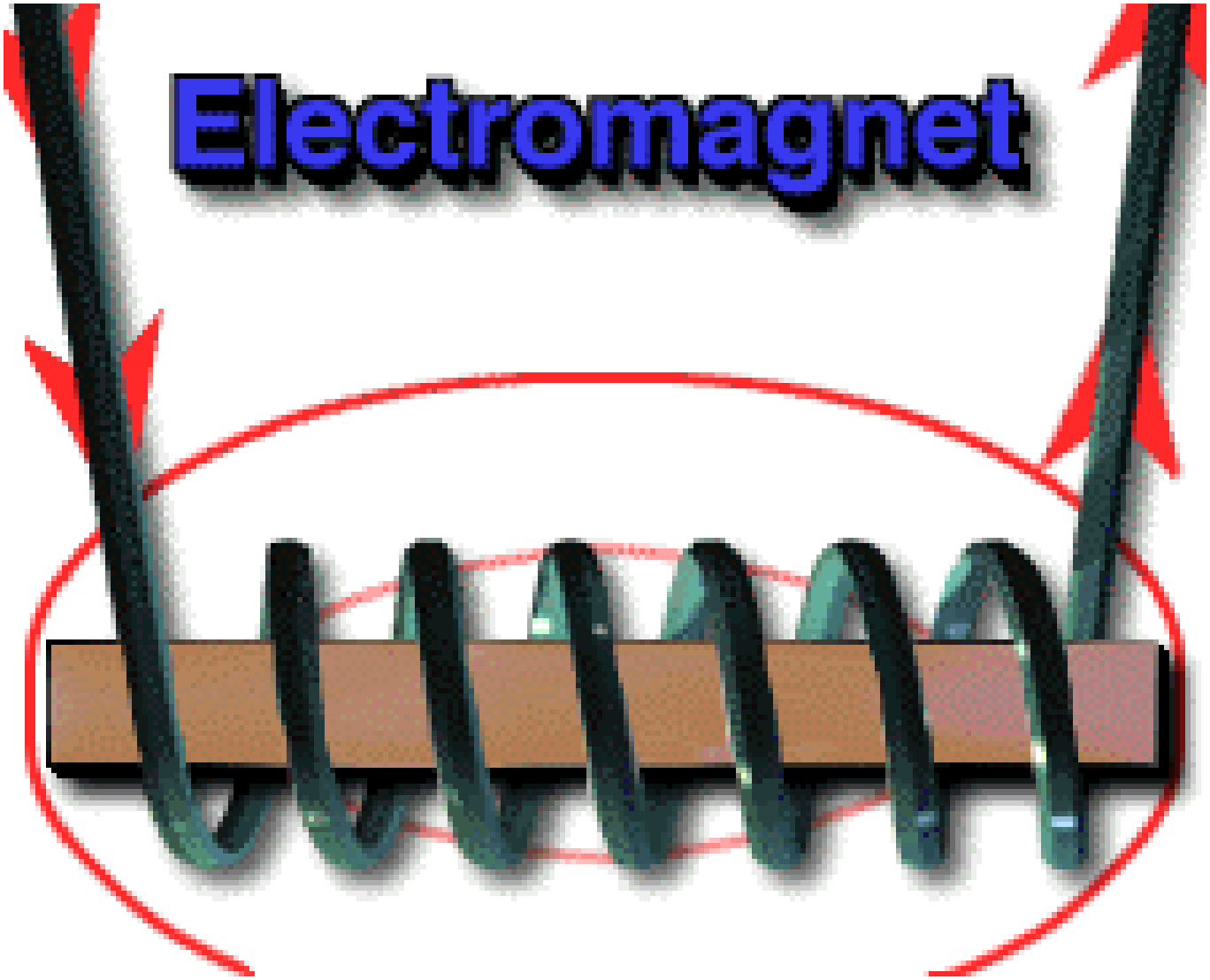
Simple Motor

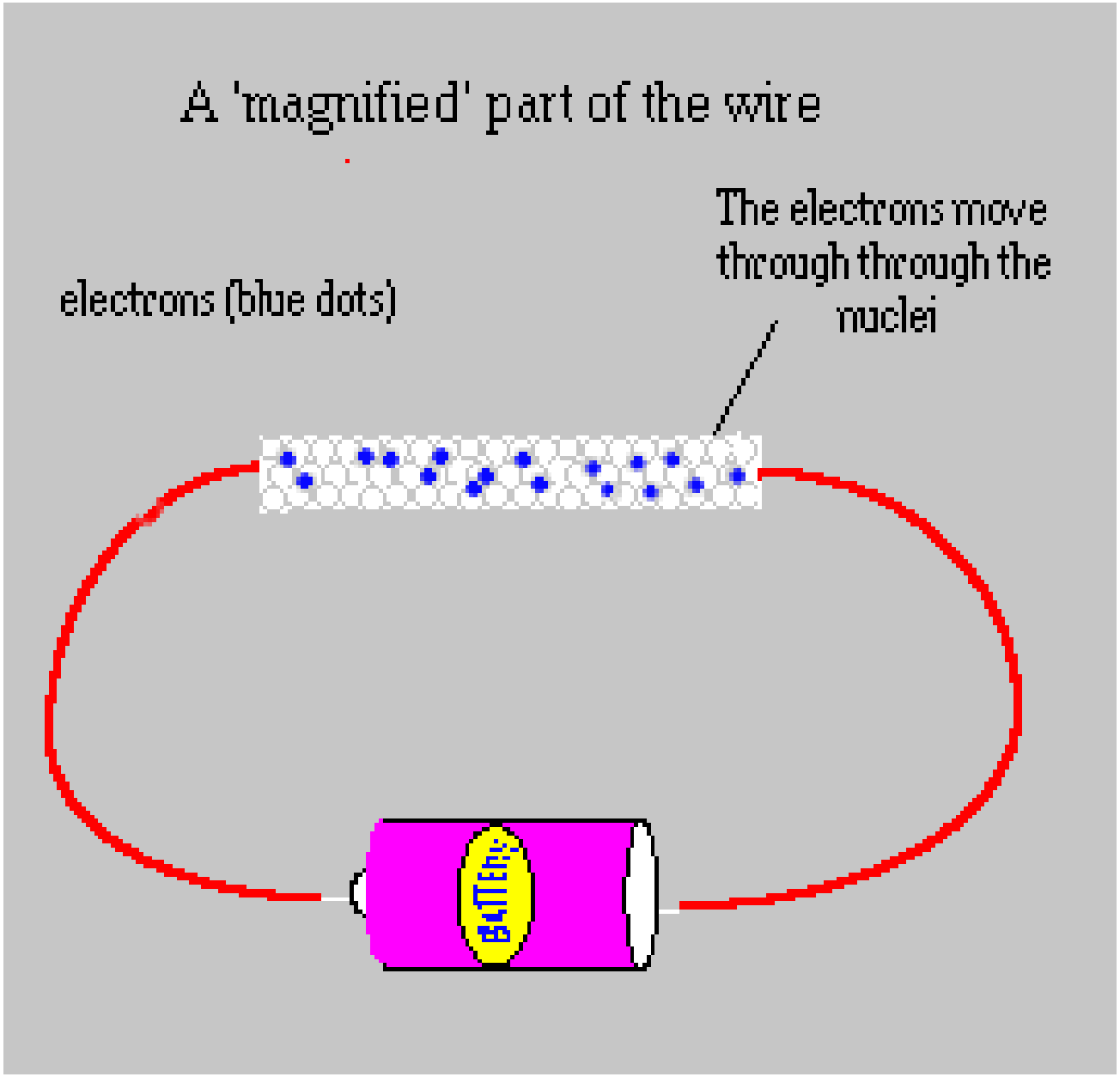





NORTH
SOUTH
To Battery
©2001 HowStuffWorks

Electromagnet




A 'magnified' part of the wire
The electrons move through through the nuclei
electrons (blue dots)
BATTERY

WARM UP-

1. HOW DOES A GENERATOR WORK? EXPLAIN.

2. HOW DOES A SIMPLE MOTOR WORK? EXPLAIN.

What Did I Learn About Inclined Planes?

- Less effort force (EF) required to pull a load if the ramp is lower (less friction & gravity)
- Ramps are used to reduce effort force, but add distance

less EF, longer distance

Pulleys

- Make work easier in 2 ways:
- Change the direction of the EF
- Change the EF needed
- 2 or more pulleys reduces the EF needed & controls the direction of the EF
- 1 fixed pulley- same EF, different direction

Ex: flag poles, ships' masts

Notes

Steps to Technological Design

1. Need or problem identification
2. Problem or solution design
3. Implementation of design solution
4. Evaluation

WARM UP-

Create a wacky sentence to remember the 6 types of simple machines!

Pulley	Screw
Lever	Wedge
Inclined Plane	Wheel & Axle