

Design of a Door Alarm

Name: _____

4th Grade – Design Task Assessment

Date: _____

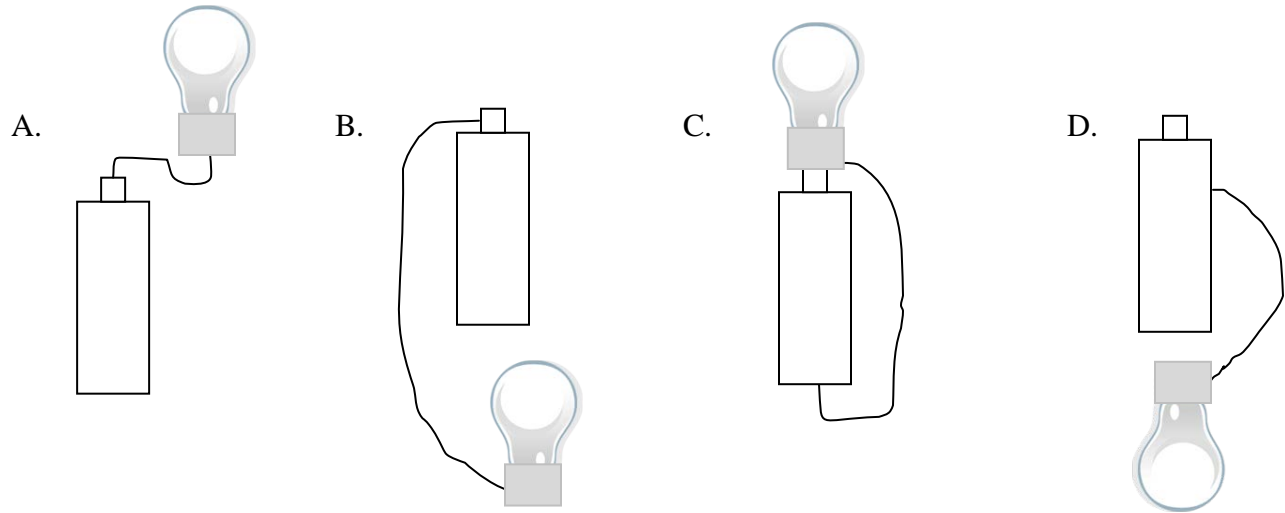
Directions: For each of the questions below, choose the BEST answer.

- 1) A material that allows electricity to flow through it easily is called a(n) _____.
 - A. conductor
 - B. insulator
 - C. current
 - D. reflector

- 2) Electricity can flow through _____.
 - A. a diagram
 - B. a closed circuit
 - C. an open circuit
 - D. air

- 3) Which of the following is a material used as a **conductor**?
 - A. glass
 - B. plastic
 - C. rubber
 - D. copper

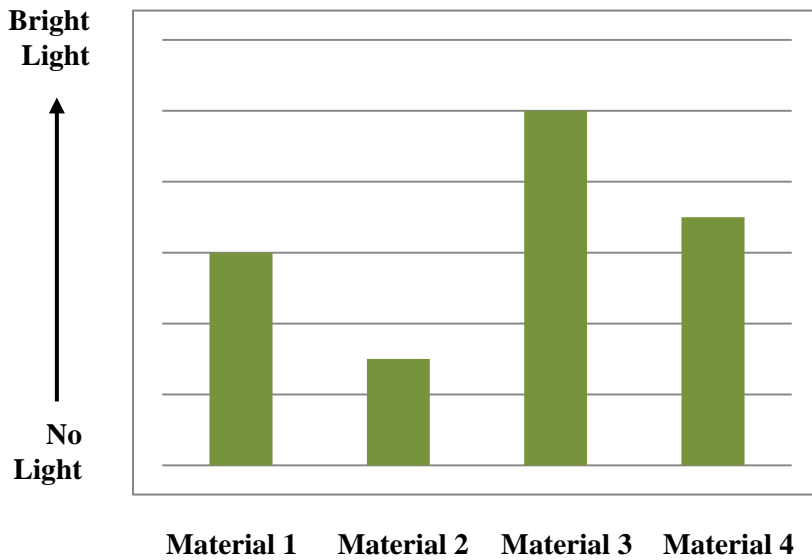
4) Which illustration will light the bulb?



5) When John turns a flashlight on, the bulb lights up because the circuit is:

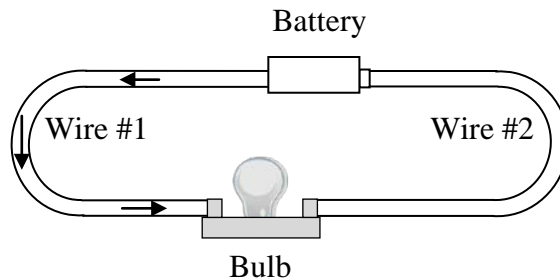
- A. closed.
- B. open.
- C. blocked.
- D. broken.

- 6) A circuit with a light bulb is tested using different materials. Based on the results shown in the chart, which material is the *best* conductor?



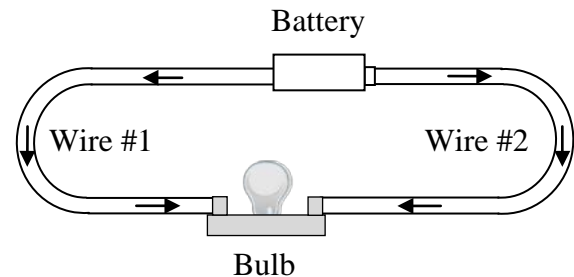
- A. Material 1
- B. Material 2
- C. Material 3
- D. Material 4

- 7) This diagram shows a glowing light bulb connected to a battery using wires. An electric current is flowing from the battery, through Wire #1 to the bulb.

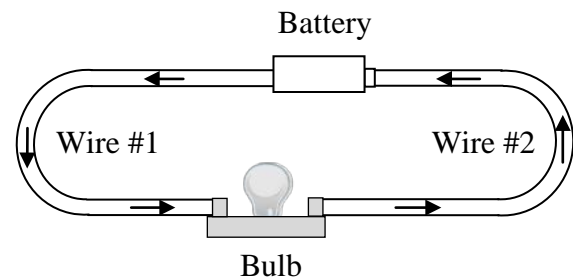


What do you think is happening in Wire #2? Choose the BEST answer.

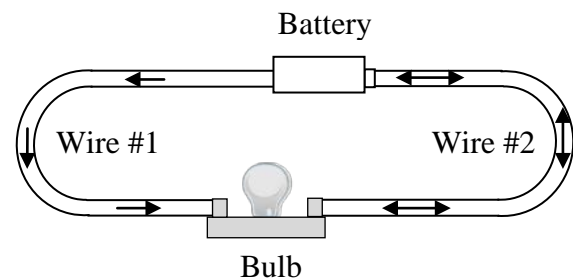
- A. The electric current flows through Wire #2 from the battery to the bulb.



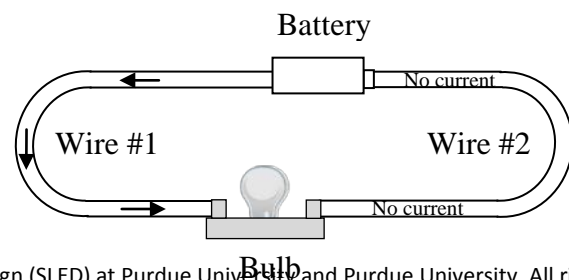
- B. The electric current flows through Wire #2 away from the bulb to the battery.



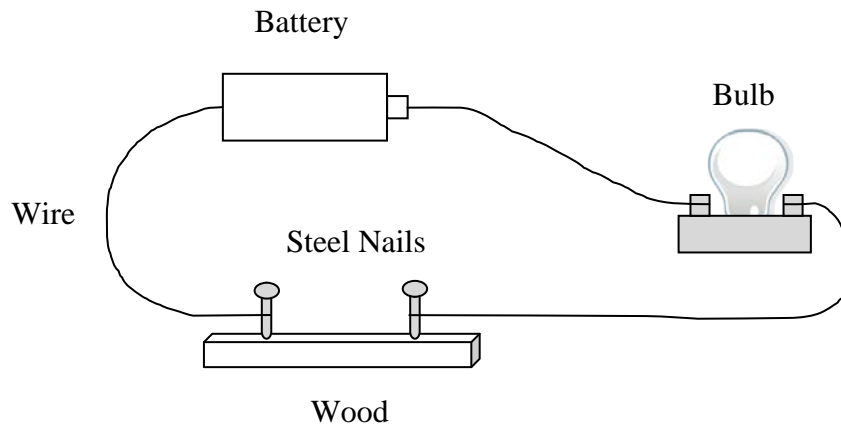
- C. The electric current flows through Wire #2 back and forth between the bulb and the battery.



- D. No electric current flows in Wire #2, it is all used up by the bulb.



- 8) A student set up the electrical circuit shown below. The bulb did not light. What can the student do to make the bulb light?



- A. Add a second battery to the first battery.
- B. Replace the wires with thicker wires.
- C. Replace the steel nails with aluminum nails.
- D. Connect the steel nails with a piece of wire.
- 9) Which material is the best **conductor** of electricity?
- A. Wood
- B. Metal
- C. Stone
- D. Plastic

Note: Questions 8, 9 from or modified from: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 Science Assessment.

- 10) Jim and Linda were working together to build a container to hold their sunglasses. They made a frame using Popsicle sticks and wrapped tissue paper around the frame. Which part of the engineering design process is this?
- A. plan
 - B. create
 - C. test
 - D. improve
- 11) Mariah is an engineer working with other engineers to design a solar-powered car. The engineering team has designed and built their first prototype but it does not meet the client's requirements. Which of the following would be helpful for the team to do now?
- A. Communicate to the client the project is finished.
 - B. Stop work on the car because the problem cannot be solved.
 - C. Investigate ways to redesign the car and continue testing.
 - D. Brainstorm how to use a gasoline-powered engine instead.
- 12) The *best* explanation why engineers use the engineering design process is to _____.
- A. draw plans for other engineers to look at.
 - B. help create new technology to solve a need.
 - C. perform experiments to test a hypothesis.
 - D. build a prototype for other engineers to see.