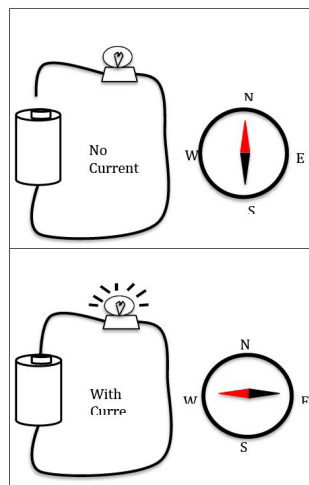


Checkout Questions

Lab 11. Design Challenge

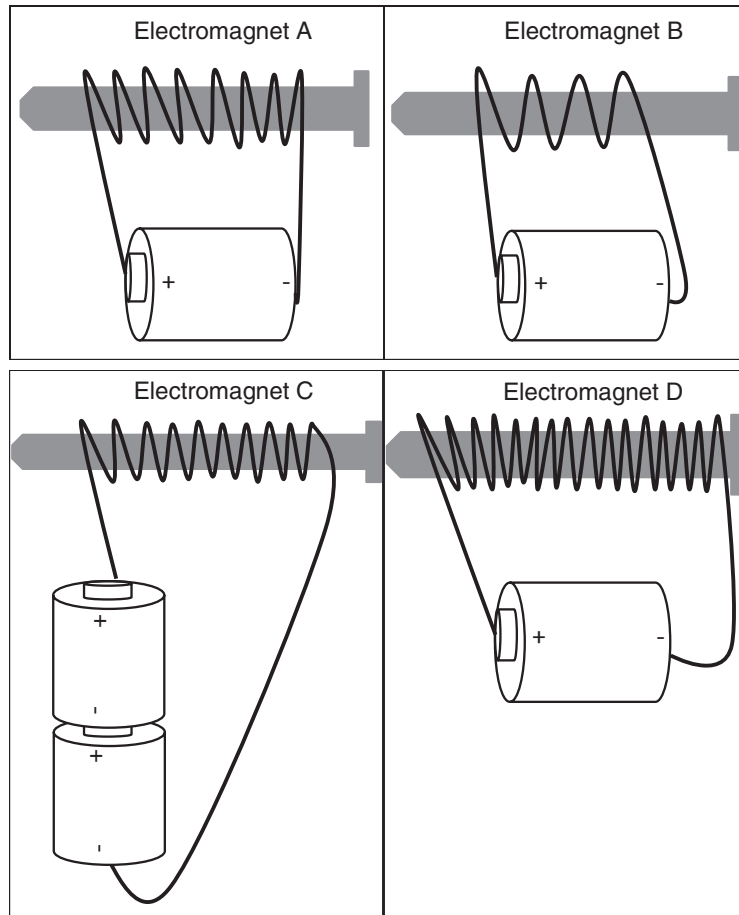
Which Electromagnet Design Is Best for Picking Up 50 Paper Clips?

1. A compass needle is a small magnet that aligns with the magnetic field of Earth and is used to help people tell which direction is north when they are traveling. But whenever a compass gets close to a strong electric current, the compass needle points in a different direction—see the drawings below.



Use the images and what you know about magnets and electric currents to explain why the compass needle will move when there is an electric current present.

2. Look at the drawings of the electromagnets below. Which one will be the strongest—A, B, C, or D?



Explain your answer. Why did you make that decision?

3. When scientists use their imagination and creativity, it makes their work less scientific.

- a. I agree with this statement.
- b. I disagree with this statement.

Explain your answer, using an example from your experience designing an electromagnet.

4. Scientists use the scientific method to design investigations to answer questions.

- a. I agree with this statement.
- b. I disagree with this statement.

Explain your answer, using an example from your experience designing an electromagnet.

5. Changing one aspect of a system or one variable in an investigation can have an impact on many other things. Explain how understanding cause-and-effect relationships is helpful to scientists. Use an example from your experience designing an electromagnet to help in your explanation.
6. Before designing equipment, engineers usually make mathematical models or smaller versions of the equipment to test out how it will work. Using an example from your experience designing an electromagnet, explain why it is important for scientists and engineers to make models of systems.