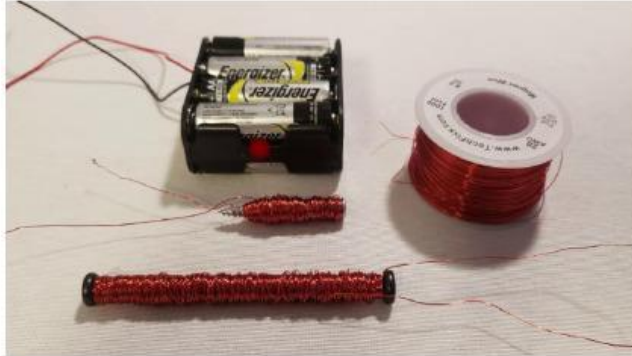


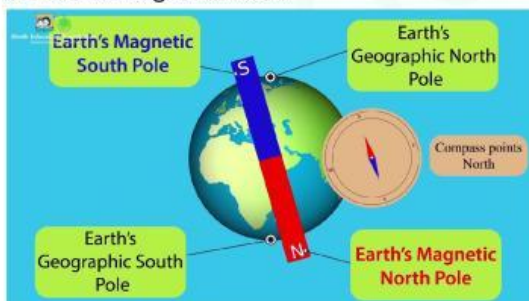
FSI Forces & Fields Unit Assessment Prep

Georgia Standards of Excellence: S8P5a–d

1. Investigating Electromagnets

Ms. Johnson gives her students a large nail, copper wire, a 9-volt battery, and 15 paper clips. Each group wraps the wire around the nail a different number of times and counts how many paper clips it can lift. Which question would this investigation help answer?

- A. How does changing the voltage affect magnetic strength?
- B. How does increasing the number of wire loops change the magnet's strength?
- C. Which type of wire conducts electricity most efficiently?
- D. What type of metal creates a permanent magnet?

2. Earth's Magnetic Poles

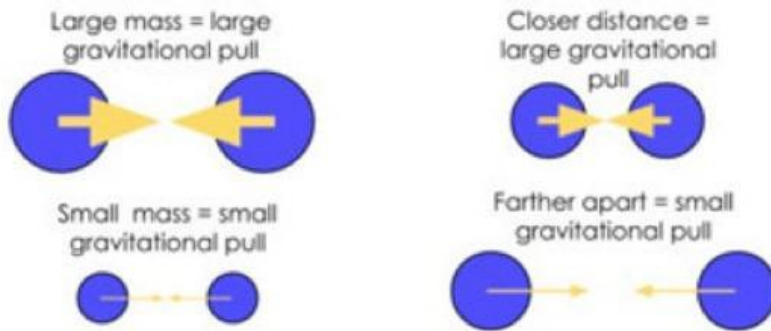
A ship is sailing near Earth's north magnetic pole. The compass needle points toward the geographic south. Which statement explains this observation?

- A. The compass's north pole is attracted to Earth's north magnetic pole.
- B. The compass's north pole is repelled by Earth's north magnetic pole.
- C. The compass's south pole is attracted to Earth's north magnetic pole.
- D. The compass's south pole is repelled by Earth's north magnetic pole.

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Use the following diagram to answer questions 3 and 4.



3. Gravity and Distance

Four pairs of planets are shown, each pair having different distances between them. Which pair of planets would experience the strongest gravitational attraction?

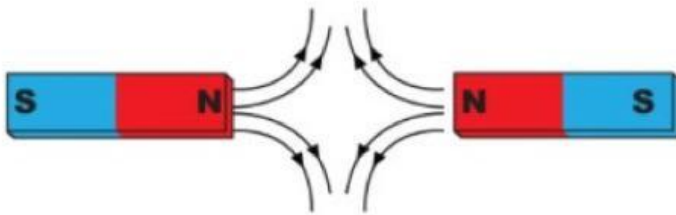
- A. Two small planets close together
- B. Two small planets far apart
- C. A small and large planet far apart
- D. Two large planets that are very close together

4. Gravity and Mass

If the mass of one object doubles, what happens to the gravitational force between it and another object (assuming distance stays the same)?

- A. The force doubles
- B. The force stays the same
- C. The force is cut in half
- D. The force becomes four times weaker

5. Magnetic Force Without Contact



Two bar magnets are placed near each other without touching. One magnet pushes the other away. What does this demonstrate?

- A. Magnets only attract metal objects.
- B. Magnetic fields require contact to act.
- C. Magnets exert forces through magnetic fields even without touching.
- D. Magnetic forces only exist in moving magnets.

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6. Charging by Friction

A plastic ruler is rubbed with wool and gains a negative charge.

Which object would it attract?

- A. Another negatively charged ruler
- B. A neutral piece of paper
- C. A metal rod with negative charge
- D. Another piece of wool

7. Movement of Electrons in Conductors

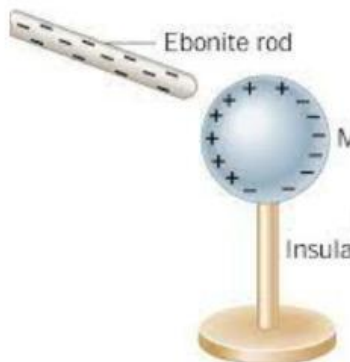


A negatively charged balloon is brought near two metal cans that are touching.

What happens to the electrons in the metal cans?

- A. They move toward the balloon.
- B. They move away from the balloon.
- C. They spread evenly through both cans.
- D. They leave the cans completely.

8. Separation of Charge



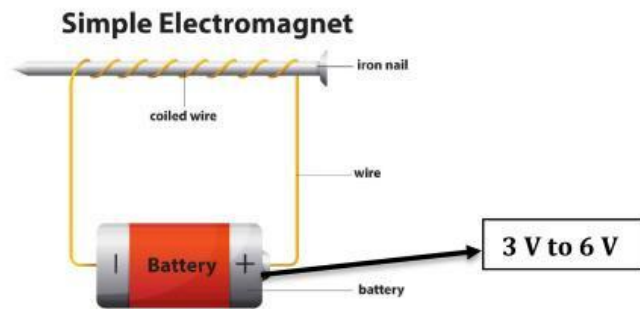
Two neutral metal spheres are placed side-by-side on an insulating base. A negatively charged rod is brought close to the left sphere. What happens to the charge distribution?

- A. Electrons move toward the left sphere.
- B. Electrons move toward the right sphere.
- C. Protons move toward the right sphere.
- D. Both spheres lose all charge.

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9. Voltage and Magnetic Strength



A student builds an electromagnet and increases the battery voltage from 3 volts to 6 volts while keeping the number of wire coils the same.

What effect will this most likely have?

- A. The magnet will become weaker.
- B. The number of coils will increase.
- C. The magnet will lift more paper clips.
- D. The magnet's poles will reverse direction.

10. Distance and Magnetic Field Strength



A student moves a paperclip closer to an electromagnet and observes it being pulled more strongly.

What conclusion can be made?

- A. Magnetic force only depends on wire thickness.
- B. Magnetic force is constant regardless of distance.
- C. Magnetic force weakens near the magnet.
- D. Magnetic force increases as distance decreases.

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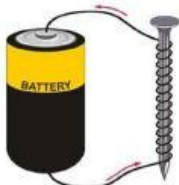
11. Number of Coils and Strength



Marissa notices her electromagnet lifts more objects when she wraps more coils of wire around the same nail. Which conclusion is correct?

- A. Increasing the number of coils decreases current flow.
- B. Increasing the number of coils makes the nail longer.
- C. Increasing the number of coils strengthens the electromagnet.
- D. Increasing the number of coils makes the magnet permanent.

12. Attracting a Paper Clip



A student builds an electromagnet and finds that it does not pick up a nearby paper clip. What should the student try next?

- A. Use a stronger battery.
- B. Decrease the number of wire loops.
- C. Use a smaller metal core.
- D. Move the magnet farther away.

13. Balloon and Wall Interaction



When a balloon is rubbed with hair, it gains a negative charge and sticks to the wall.

Which statement best explains this?

- A. The wall becomes negatively charged and repels the balloon.
- B. The wall's positive charges are attracted to the balloon's negative charges.
- C. The balloon attracts the wall's electrons.
- D. Both the balloon and wall repel each other.