

Name: \_\_\_\_\_

Class Period: \_\_\_\_\_

### **FSI Forces & Fields Unit Assessment Prep**

Georgia Standards of Excellence: S8P5a–d

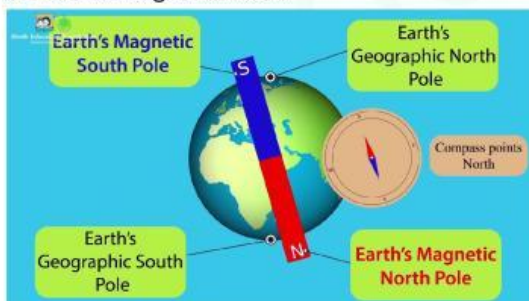
#### **1. Investigating Electromagnets**



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**



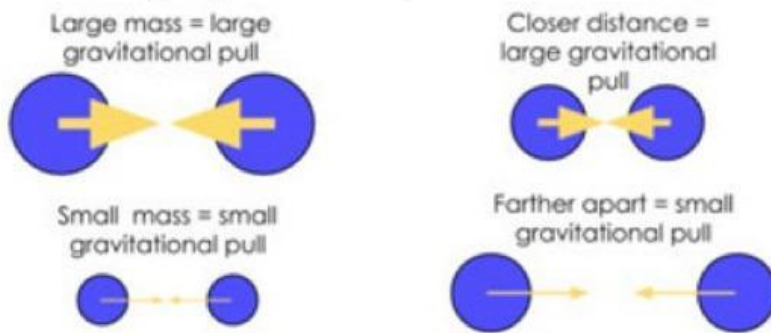
A ship is sailing near Earth's north magnetic pole. The compass needle points toward the geographic south. Which statement explains this observation?

- 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.

Name: \_\_\_\_\_

Class Period: \_\_\_\_\_

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?

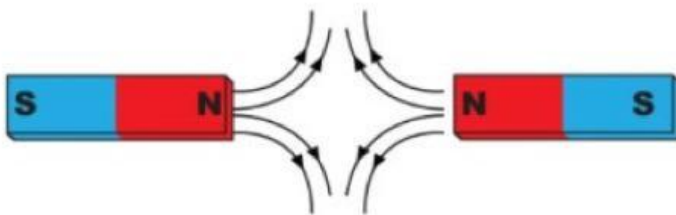
- A. Two small planets close together
- B. Two small planets far apart
- C. A small and large planet far apart
- D. Two large planets that are very close together

### 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.

Name: \_\_\_\_\_

Class Period: \_\_\_\_\_

#### 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

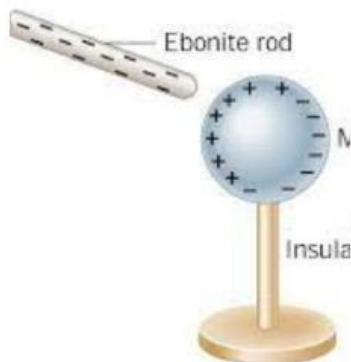


**A negatively charged balloon is brought near two metal cans that are touching.**

**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



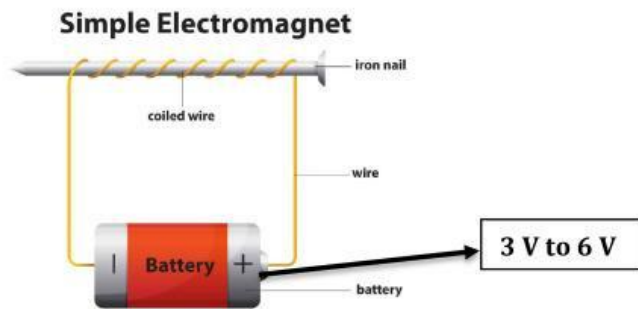
**Two neutral metal spheres are placed side-by-side on an insulating base. A negatively charged rod is brought close to the left sphere. What happens to the charge distribution?**

- 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.

Name: \_\_\_\_\_

Class Period: \_\_\_\_\_

### 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.

Name: \_\_\_\_\_

Class Period: \_\_\_\_\_

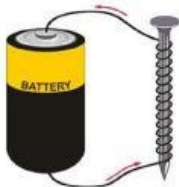
11. Number of Coils and Strength



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.