

Switchable Magnet Evidence

Use test results to explain how electricity and magnetism connect.

S5P3 "Obtain, evaluate, and communicate information about magnetism and its relationship to electricity."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline these two sentences in paragraph 2: the sentence beginning "Their test showed" and the sentence beginning "This observation." Number them 1 and 2 to show the evidence that supports the claim that electric current creates a magnetic field.

A Nail That Picks Up Clips

- ① At the school makers club, students built a simple electromagnet. They wrapped insulated wire around an iron nail and connected the wire ends to a battery. When the circuit was closed, electric current moved through the wire. The nail then picked up paper clips. When a student opened the circuit, the paper clips fell away. This change happened each time they tested it.
- ② The group compared their results with a plain nail that had no wire or battery. The plain nail did not pick up the clips. Their test showed that the nail picked up clips only while current flowed through the coiled wire. This observation is evidence that an electric current creates a magnetic field around the wire. Scientists call this device an electromagnet.
- ③ Electromagnets are useful because people can turn them on and off by opening or closing a circuit. At a recycling center, a crane uses an electromagnet to lift scrap steel, then drops it when the current stops. A motor also uses electricity and magnetic forces to make parts spin. Reliable explanations connect observations from fair tests to a scientific claim.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What scientific claim do the two underlined sentences support?

2 What happened to the paper clips when the student opened the circuit?

3 How did the plain nail help the group evaluate their results?

4 How does the recycling-center crane show the relationship between electricity and magnetism?

3 YOUR TURN _____ Your own words

Write exactly three sentences. State a claim about what will happen when an electromagnet's circuit is closed and opened, describe a fair two-step test using the same nail, wire, battery, and paper clips, and explain what result would support your claim.

PART 1 • READ AND MARK

Underline these two sentences in paragraph 2: the sentence beginning “Their test showed” and the sentence beginning “This observation.” Number them 1 and 2 to show the evidence that supports the claim that electric current creates a magnetic field. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What scientific claim do the two underlined sentences support?	An electric current creates a magnetic field around the wire.
2	What happened to the paper clips when the student opened the circuit?	The paper clips fell away from the nail.
3	How did the plain nail help the group evaluate their results?	The plain nail did not pick up clips, so the group could compare it with the nail wrapped in wire and connected to a battery.
4	How does the recycling-center crane show the relationship between electricity and magnetism?	Electric current turns the crane's electromagnet on to lift scrap steel. When the current stops, it can drop the steel.

PART 3 • YOUR TURN (SAMPLE ANSWER)

When the circuit is closed, the nail electromagnet will pick up paper clips, and when it is opened, it will not. I will use the same nail, wire, battery, and paper clips, first close the circuit, then open it. If clips stick only during the closed-circuit trial, that result supports my claim.

Accept equivalent wording that identifies current as the cause of the electromagnet's magnetic effect. For Part 3, look for a test that changes only whether the circuit is closed or open, plus a claim and supporting result.