

Electromagnets

Electromagnet Forge with Snapling

Learning target

Explain an electromagnet at a qualitative level.



Before you begin

Use the reference page and discussion prompts on their own, or open the optional browser adventure. No earlier lesson or physical kit is required.

For online play: use an internet-connected current browser with local storage enabled. Read the three-part Gemling briefing, answer the quick check, and apply the evidence at three checkpoints. Retry feedback supports review; results are not a secure test or gradebook.

Use for teacher-led review, science centers or partner practice. Independent readers may need support with the vocabulary below. The design target is grades 3-5; choose support based on the learner.

Vocabulary and concepts to discuss

Current and magnetism; coils; iron core; switching on and off

Open Electromagnet Forge - direct lesson link

Scan the QR code or use the clickable link. This guide is usable offline; the adventure runs on an external educational website.



Electromagnets - key ideas

1. The first clues

Electric current in a coil produces a magnetic effect. An iron core can strengthen the effect in an electromagnet model.

2. How the clues connect

Switching the current controls the magnetic effect, making electromagnets useful for some lifting and releasing tasks. Real devices vary.

3. Our evidence record

Our digital low-voltage crane model attracts iron with current on and releases it when switched off. This is a scaffolded model, not instructions to build a powered device.

Keep the science accurate

Electromagnets are a scaffolded extension. Use a digital or controlled low-voltage model; no mains power.

Apply the evidence

Use a specific observation from this lesson to explain one choice. Point to a clue, then connect that clue to a scientific idea.

Curriculum reference: <https://www.nextgenscience.org/dci-arrangement/3-ps2-motion-and-stability-forces-and-interactions>

Talk through the evidence

1. What produces the magnetic effect in this model?

Expected answer: Current in the coil

Reasoning: Electric current in a coil produces a magnetic effect. An iron core can strengthen the effect in an electromagnet model.

2. When does the model lift iron?

Expected answer: With current on

Reasoning: Our digital low-voltage crane model attracts iron with current on and releases it when switched off. This is a scaffolded model, not instructions to build a powered device.

3. Why is switching useful for a crane?

Expected answer: It can control pickup and release

Reasoning: Switching the current controls the magnetic effect, making electromagnets useful for some lifting and releasing tasks. Real devices vary.

4. What kind of investigation is required here?

Expected answer: A digital model

Reasoning: Our digital low-voltage crane model attracts iron with current on and releases it when switched off. This is a scaffolded model, not instructions to build a powered device.

Guide the discussion

Ask learners to name the evidence that supports their answer. If an answer differs, revisit the matching key idea on page 2 and invite a revised explanation.

Online rewards: this lesson grants one fixed digital Expedition Discovery. Five saved digital Gemling friends become available only after all six distinct subject lessons are complete, in any order. Digital rewards do not establish physical ownership.