Sample Body of Evidence

Science

Grade 4 – Second Reporting Period

FOSS California Magnetism and Electricity
Physical Science/Investigation & Experimentation

This sample is intended to demonstrate the essential elements of a body of evidence. The evidence includes:

- Expected Student Responses to Grade Level Prompts (Science Notebook Sheets) identified in the Recommended Body of Evidence

This sample includes Expected Student Responses on Student Notebook Sheets identified in the Recommended Body of Evidence. This sample will be replaced with San Diego Unified School District proficient student work when it becomes available.

Important Note:
For the first two grading periods, students are evaluated based upon their progress toward end-of-year standards. Students who receive a mark of "proficient" for the first and second grading periods are making consistent and adequate progress toward achieving end-of-year expectations. In the final reporting period, the report card marks reflect a student's actual achievement of the cumulated skills, strategies, and concepts identified in the California frameworks and content standards (SBRC, 2007).

Winter 2008

Prompt #1

Name

Date ANSWERS

RESPONSE SHEET—THE FORCE

Sandy wrote in her science notebook:

> Magnets only stick to other magnets. When a magnet touches an iron nail, the nail becomes a temporary magnet. That is why the magnet sticks.

1. Do you agree with Sandy? Why or why not?

Agree with Sandy. When magnet A comes close to or touches a piece of steel, magnetism is induced in the steel. The steel becomes temporary magnet B. When the steel becomes a magnet, it is attracted to magnet A.

When a magnet comes close to an aluminum nail, no magnetism is induced, so it doesn't stick to a magnet.

2. How could you prove that the nail had become a magnet?

A steel nail won't pick up a steel paper clip by itself. When the steel nail is touching a magnet, the steel nail will pick up a paper clip. The nail became a magnet.

Prompt #2

Name

Date ANSWERS

CHARGE

1. Rub a balloon on your hair. What do you predict will happen if you bring the charged balloon close to two hanging charged balloons?

They will all repel.

Why do you think so?

They will all have the same charge (negative charge). When negative charges come together, they repel.

2. Rub a balloon on your hair. What do you predict will happen if you bring your *other* hand close to two hanging charged balloons?

They will attract.

Why do you think so?

When the balloon gets a negative charge, your hair gets a positive charge. The charge goes through your whole body. When the positive hand is close to the negative balloon, they attract.

3. Conclusions. What is the general rule for how charged objects interact?

Two positively charged objects or two negatively charged objects will repel each other. A positively charged object and a negatively charged object will attract each other. Rule: Like charges repel; opposite charges attract.

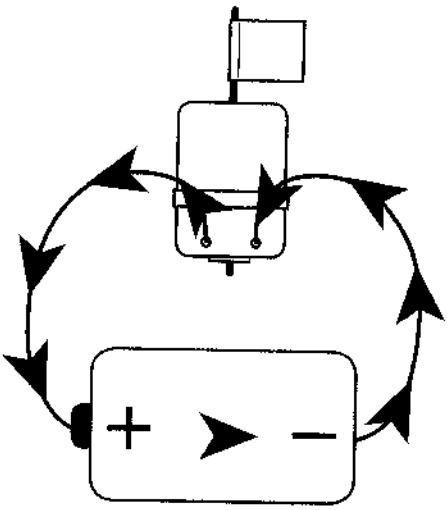
Prompt #3

Name

Date ANSWERS

RESPONSE SHEET—MAKING CONNECTIONS

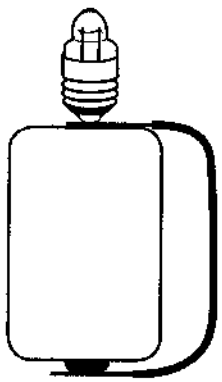
1. Ahmed drew a picture of a motor circuit he built. Draw arrows on the picture to show how electricity flows through the circuit. Explain below why you drew the arrows the way that you did.



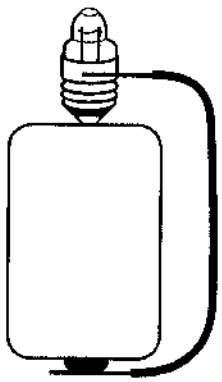
Electricity flows in one direction only—from the negative end of the cell to the positive end of the cell.

2. Look at the two bulb-and-battery circuits pictured below. Only one will light the bulb. Which one do you think will work and why?

A



B



B will light the bulb.

A is a short circuit. The current goes from one end of the cell directly to the other. Current goes past, not through, the bulb.

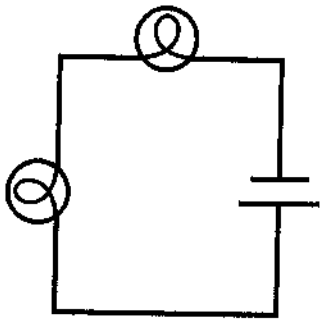
B shows a complete circuit. Current will flow through the bulb, producing light.

Prompt #4 Name _____

Date ANSWERS

TWO BULBS IN SERIES

1. Draw a diagram of a series circuit that will light two bulbs.



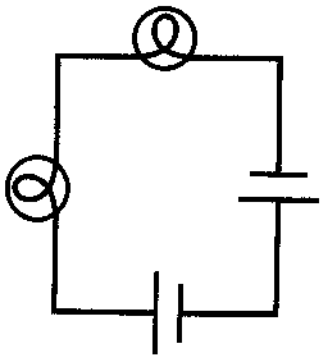
2. Why do you think the two lights are dim when they are in series?

Sample answers: Two bulbs use more electricity; bulbs have to share the electricity; two bulbs slow the electricity down; it's harder for electricity to get through two bulbs than one; electricity has to go farther.

3. Why do you think two lightbulbs are bright when two D-cells are used in series?

Answers will vary. Two D-cells provide twice as much electricity.

4. Draw and label a schematic diagram of your series circuit that made two lightbulbs glow brightly.



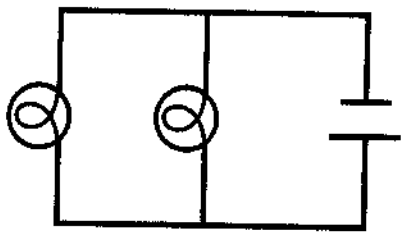
Prompt #5

Name

Date ANSWERS

TWO BULBS IN PARALLEL

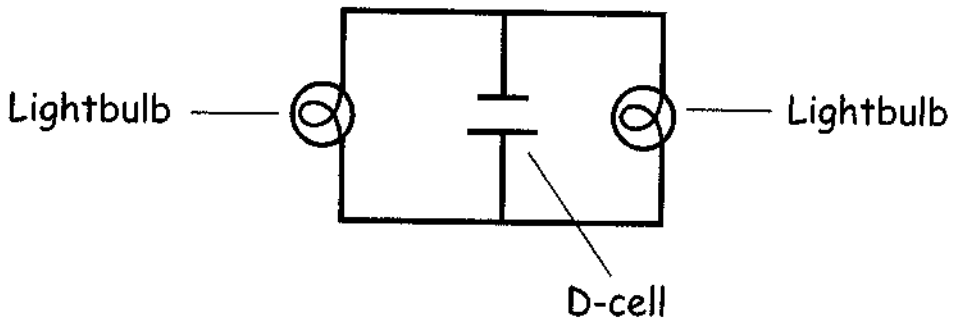
1. Draw a schematic diagram of a parallel circuit that will light two bulbs.



2. Why do you think the two lights are bright when they are in parallel?

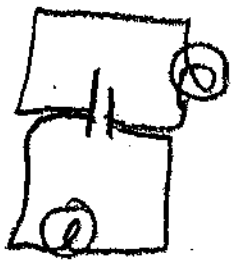
Both bulbs have a direct pathway to the source of electricity; they don't have to share the electric current.

3. Draw and label a schematic diagram of another parallel circuit that made two lightbulbs shine brightly.

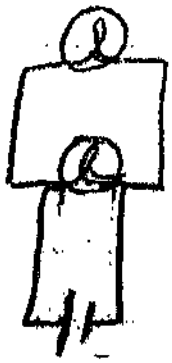


prompt #5
Investigation 3
No. 16 - Science Notebook

This is how I made two bulbs light brightly with one battery. This is a parrale circuit.



This is another way to make more than one bulb shine.



Bright?

The bulbs don't share the electricity.

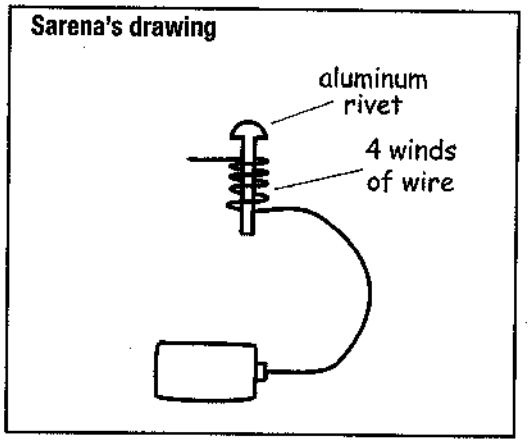
Prompt #6 Name _____ Date ANSWERS

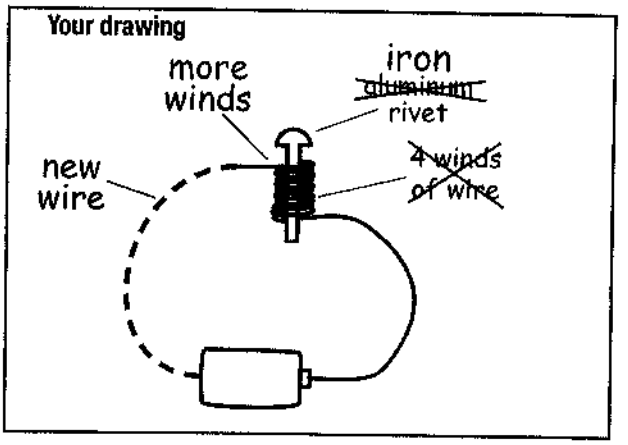
RESPONSE SHEET—CURRENT ATTRACTIONS

Sarena heard that if you wind a wire around a rivet, and connect the wire to a D-cell, you can make a magnet. She got some wire, wound it around an aluminum rivet four times, and attached it to a D-cell. She tried to pick up some paper clips, but nothing happened.

Below is the drawing she made to show what she had done. Help Sarena get her electromagnet to work.

1. Make a drawing to show how to make an electromagnet that works.





2. Explain to Sarena what she needs to change.

Sarena needs to make a complete circuit by adding another wire from the free end of her electromagnet wire to the free end of the D-cell. She should get an iron rivet and a longer electromagnet wire to put more winds around the rivet.

3. Explain to Sarena how an electromagnet works.

Current flowing in a wire creates a magnetic field around the wire. When the wire is coiled, the field gets stronger. When the wire is wound around an iron core, the magnetic field induces magnetism in the iron, making it an electromagnet as long as the current flows.

Prompt #7 Name _____ Date ANSWERS

SUMMARY: CLICK IT

ELECTROMAGNETS EVERYWHERE REVIEW

1. How does a motor work?

   Electromagnets attached to a shaft are repelled by permanent magnets surrounding the shaft. As the shaft rotates, the electromagnets turn on and off at exact times to keep the magnetic repulsion pushing the shaft around.

2. How does a doorbell make a continuous ring?

   Current flows in a circuit that includes a striker and an electromagnet. When the current flows, electromagnetism attracts the striker. The movement of the striker hits the bell and breaks the circuit. The striker returns to its original position, which completes the circuit again. The process repeats.

3. How does a speaker work?

   Pulses of electricity flow through the speaker wire to a coil attached to the speaker cone. The magnetic field created by the electricity is repelled by a permanent magnet. The speaker cone moves, making sound.

SUMMARY QUESTIONS

1. What causes the core of an electromagnet to become a magnet?

   Current flowing through a wire creates a magnetic field. The magnetic field induces magnetism in the iron core.

2. Discuss how an electromagnet can act as an energy converter.

   Electric energy can make an electromagnet, which can attract iron objects, making them move (motion energy). Electric energy can produce a magnetic field in a coil, which can attract or repel another magnetic field, producing motion energy.