ORANGE PUBLIC SCHOOLS
OFFICE OF CURRICULUM AND INSTRUCTION
OFFICE OF SCIENCE

GRADE 4
SCIENCE

I-Check 4

Unit 2:

Magnetism and Electricity

School Year 2014-2015

Directions for Grade 4 I-check 4

The Grade 4 i-check is made up of multiple choice questions, constructed response questions and performance questions.

Read each question carefully, including diagrams and/or graphs.

Work as rapidly as you can without sacrificing accuracy. Do not spend too much time puzzling over a question that seems too difficult for you. Answer the easier questions first; then return to the harder ones. Try to answer every question, even if you have to guess.

Where necessary, you may use scratch paper for your work. Do not use the margins of the test booklet to do scratch work.

FOR ALL QUESTIONS, YOU MUST RECORD ALL OF YOUR ANSWERS ON THE TEST BOOKLET.

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Investigation 4—Current Attractions

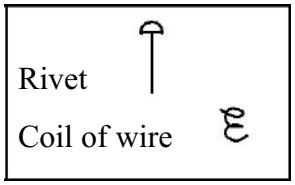
Name
Date

49. The rule you use to help you decide whether two magnets will attract or repel when they come close together is _____ poles repel and _____ poles attract.

50. Steve wants to make an electromagnet.

a. Write a letter to Steve describing how to build one.

b. Draw a schematic diagram to show Steve how to make his electromagnet. Use the symbols you already know plus the new ones shown below.



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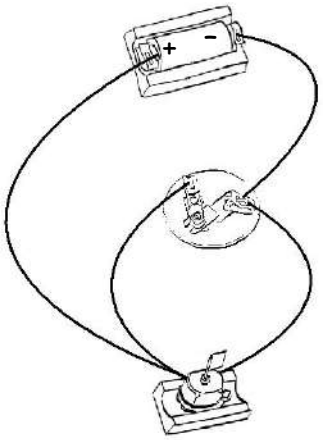
Investigation 4—Current Attractions

51. When you make an electromagnet, where does the magnetism come from?

52. Look at the picture of the circuit to the right.



- What will happen to the motor if the lightbulb burns out?

- Why does that happen?

53. What do you know about making temporary magnets that would help you decide whether to use a brass rivet or an iron rivet for the core of an electromagnet?

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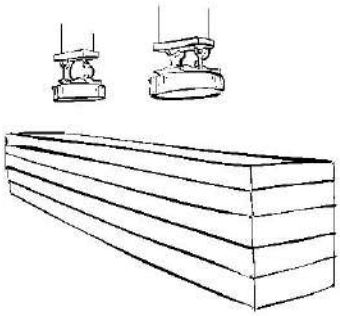
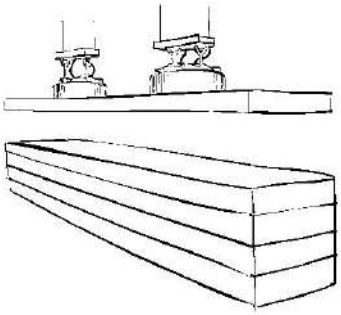
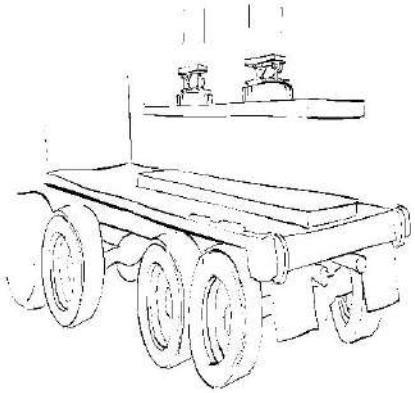
54. The machine you see in the pictures is used to load steel beams onto delivery trucks.



Getting ready to lift a beam



Lifting a beam



Dropping a beam on a truck

There are no hooks or ropes that attach the steel beams to the lifting machine. How is the machine able to pick up and drop the steel beams?

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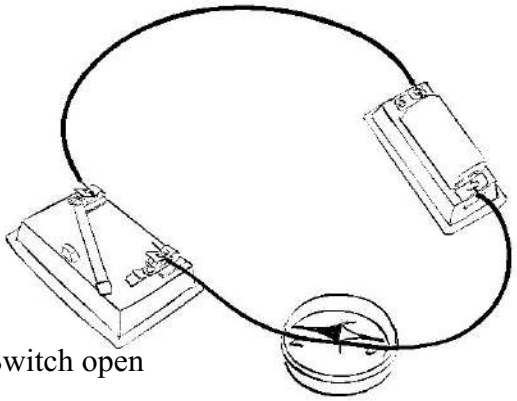
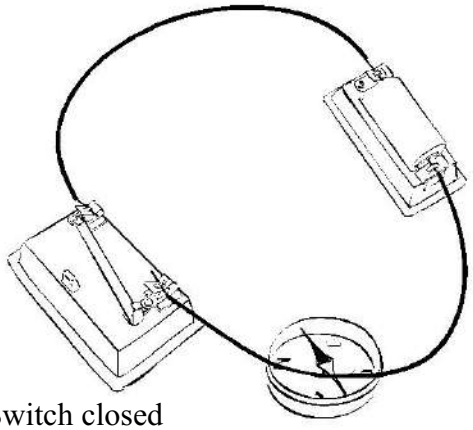
55. If you put a compass under a wire and close a switch so electricity flows through the wire, the compass needle will move.



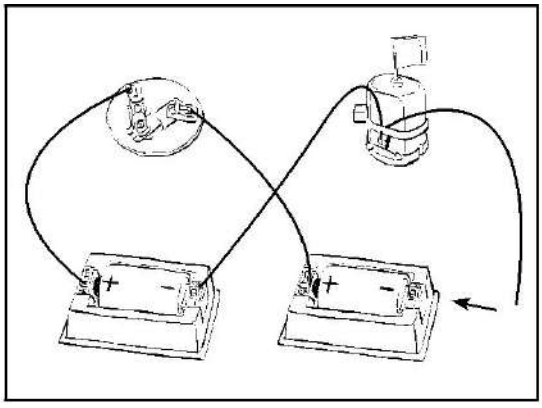
Switch open



Switch closed

Explain why the compass needle moves.

56. • What will happen when the loose wire on the right side of the motor is connected to the negative terminal of the D-cell as shown in the picture?



• Why do you think that will happen?

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57. Lynley made an electromagnet, but it was very weak. Below is a list of ways she thinks might be used to make it stronger.

Help Lynley by marking an X next to each of the ways the strength of an electromagnet can be increased.

(You may mark more than one answer.)

_____ Increase the number of winds around the core.

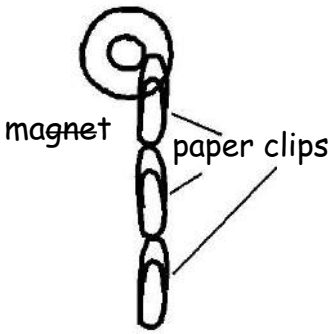
_____ Use thicker wire.

_____ Add another D-cell in the circuit.

_____ Add a switch in the circuit.

58. Kurt was investigating which objects stick to magnets. He made an entry in his science notebook and drew a picture to help explain what he did.

I picked up a paper clip with a magnet. Then that paper clip picked up another one, and then another one. And they weren't hooked together either. All they had to do was touch each other.



Explain to Kurt why he was able to pick up three paper clips, even though the magnet was only touching the first one.

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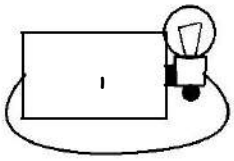
59. Complete the following sentences.

- A hair dryer converts electric energy into _____ .
- A doorbell converts electric energy into _____ .

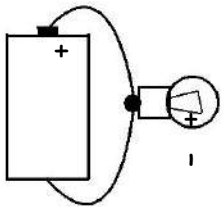
60. Only one circuit below will light the bulb. Which one will work?

(Circle the one best answer.)

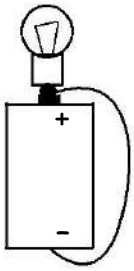
A



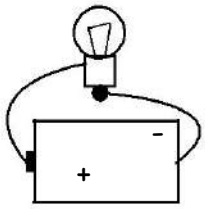
B



C



D



Why is that the only circuit that will work?

_____

_____

_____

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61. Robbie made an electromagnet by winding a coil of insulated wire around a nail. What kind of energy was changed into magnetic energy?

(Circle the one best answer.)

A. heat energy

B. electric energy

C. sound energy

D. light energy

62. The graph shows the results of an investigation with an electromagnet. If 22-gauge wire is used, how many nails will it pick up?

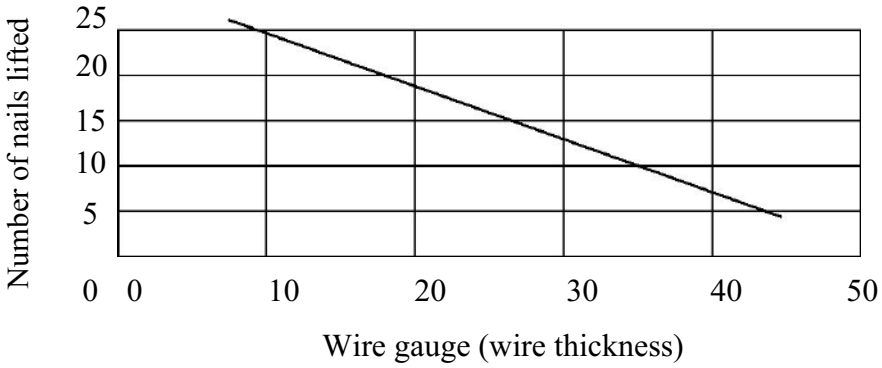
(Circle the one best answer.)

A. 15 nails

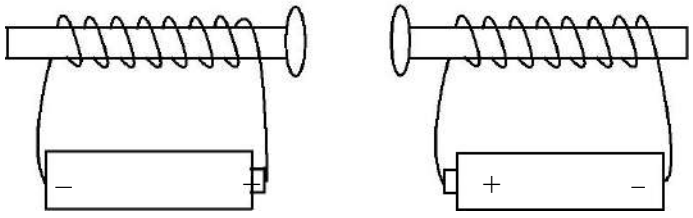
B. 24 nails

C. 18 nails

D. 10 nails



63. Two electromagnets were placed near each other. Which statement about the two magnets is true?



(Circle the one best answer.)

A. The electromagnets will repel each other.

B. The forces of the electromagnets will be cancelled (nothing will happen).

C. The electromagnets will attract.

D. Electricity will flow from one electromagnet to the other.