

***InterActions* Unit 1 Cycle 2 Sample Quiz KEY**

(Final formatting and images to be done after August 14)

1. A magnetic material is

- a. a metal that interacts with a magnet.
- b. a metal that is magnetic.
- c. any material that interacts with a magnet.

This question asks you for a definition. Science words that you might need to define are in the margins of your textbook. The glossary is also a good place to look up words.

2. An electrical conductor is

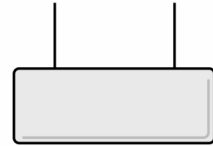
- a. a material made of metal.
- b. a material that does not allow electric current to exist in it.
- c. a material that allows electric current to exist in it.
- d. a material that is not made of metal.

This question asks you for a definition. Science words that you might need to define are in the margins of your textbook. The glossary is also a good place to look up words.

3. A magnet is brought very near to a suspended magnetic material that is free to move. The suspended magnetic material ...



Magnet

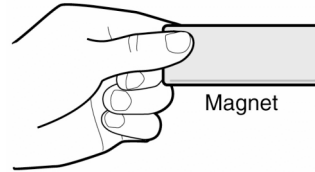


Magnetic Material

- a. moves toward the magnet.
- b. moves away from the magnet.
- c. moves toward or away from the magnet, but we can't say which way without more information.
- d. stays in the same place.

Magnetic materials are always attracted to magnets, no matter which side of the magnet is near. In this question the magnetic material is free to move, so it moves closer to the magnet. To answer this test question you need to know the defining characteristic that magnets attract magnetic materials. Use the Scientists' Consensus Ideas sheets to review defining characteristics.

4. A magnet is brought near another magnet that is suspended and free to move. The suspended magnet ...



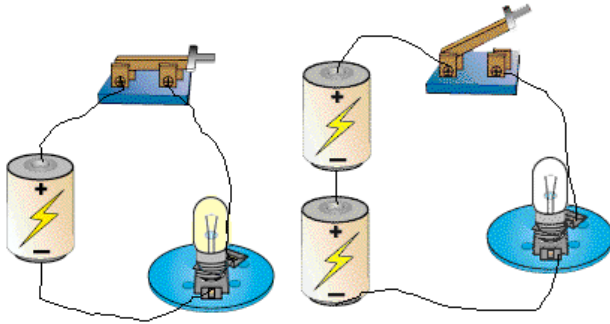
Magnet

Magnet

- a. begins to move toward the magnet.
- b. begins to move away from the magnet.
- c. begins to move either toward or away from the magnet.
- d. stays in the same place.
- e. There is not enough information to decide.

A magnet can be attracted to or repelled by another magnet. This is one of the defining characteristics of a magnetic interaction. To answer this test question you need to know a defining characteristic of a magnetic interaction, and use it to answer a question about two interacting objects. Use the Scientists' Consensus Ideas sheets to review defining characteristics.

5. A closed electric circuit consists of one battery and one bulb. If a second battery is added as shown, what happens to the brightness of the bulb when the circuit is closed?



- a. The bulb becomes brighter.
- b. The bulb becomes dimmer.
- c. The brightness of the bulb does not change.
- d. There is not enough information to say what happens.

When another battery is added to the electric circuit as shown, the current increases and the bulb becomes brighter. This is one of the variables of the electric-circuit interaction. To answer this test question you need to know how a specific variable affects a circuit. Use the Scientists' Consensus sheets to review variables that influence interactions.

6. When an electrically charged object is brought near an uncharged object it \_\_\_\_\_.

- a. repels the uncharged object
- b. attracts the uncharged object
- c. attracts or repels the uncharged object depending on the type of electrical charge
- d. neither attracts nor repels the uncharged object

Electric charges attract uncharged objects. This is one of the defining characteristics of the electric-charge interaction. To answer this question you need to know a defining characteristic of the electric-charge interaction. Use the Scientists' Consensus sheets to review defining characteristics.

7. When an electrically charged object is brought near another electrically charged object it \_\_\_\_\_.
- a. repels the electrically charged object
  - b. attracts the electrically charged object
  - c. attracts or repels the electrically charged object depending on the type of electrical charges interacting
  - d. neither attracts nor repels the electrically charged object

Like electric charges repel each other and unlike electric charges attract each other. This is one of the defining characteristics of the electric-charge interaction. To answer this test question you need to know a defining characteristic of an electric-charge interaction, and use it to answer a question about two charges. Use the Scientists' Consensus Idea sheets to review defining characteristics.

8. Which of the variables listed below will increase the strength of the magnetic interaction between an electromagnet and a magnet?
- I. The number of turns of wire.
  - II. The amount of magnetic material placed within the turns of wire.
  - III. The amount of electric current in the wires.
- a. I and III
  - b. II and III
  - c. I and II
  - d. I, II, and III

By increasing the strength of the electromagnet the strength of the magnetic interaction will increase. All three of the variables listed affect the strength of the electromagnet. To answer this test question you need to know the variables that affect the strength of the electromagnet. Use the Scientists' Consensus sheets to review variables that affect the electromagnet.

9. An electromagnet interacts with a magnetic compass. As the compass is brought closer to the electromagnet the number of degrees the compass needle deflects by changes. Data is provided below.

Distance between compass and electromagnet (cm)	Deflection of compass Number of degrees (°)
30	8
25	14
20	22
15	40
10	54
5	70

- (a) Write a question in relationship form for this experiment.

If the distance between an electromagnet and a compass decreases what happens to the number of degrees that the compass needle deflects?

An experimental question is a question about the relationship between the manipulated variable and the responding variable. For example: If the *manipulated variable* increases how will the *responding variable* change? To answer this test question you need to know the manipulated and responding variables, and how to write a question that asks about their relationship. For more information see *How To Analyze an Experiment Design and Determine if the Experiment is a Fair Test*.

- (b) The manipulated variable is

The distance in cm between the compass and the electromagnet

To answer this test question you need to know that the manipulated variable is the one you deliberately change. For more information see *How To Analyze an Experiment Design and Determine if the Experiment is a Fair Test*.

(c) The responding variable is

The number of degrees ( $^{\circ}$ ) the compass deflects.

To answer this test question you need to know that a responding variable is the variable measured after changing the manipulated variable. For more information see *How To Analyze an Experiment Design and Determine if the Experiment is a Fair Test*.

(d) The variables that are controlled are

Some of the controlled variables are:

- The strength, size, and materials of the electromagnet
- The type and size of the compass.

To answer this test question you need to know that the controlled variables are held constant during an experiment. For more information see *How To Analyze an Experiment Design and Determine if the Experiment is a Fair Test*.

(e) Do the compass and electromagnet interact? If so, what is the evidence of the interaction.

The compass and the electromagnet interact. Evidence of the interaction is the change in position of the compass needle as it is brought closer to the electromagnet.

To answer this test question you need to know that evidence of an interaction is an observed change.

(f) Write an experiment conclusion and your reasons

If the distance between the magnet and the compass decreases, the number of degrees the compass needle deflects increases. The data in the data table shows that as the distance between the electromagnet and the compass is decreased steadily from 30 cm to 5 cm, the number of degrees the compass needle deflects increases from  $8^{\circ}$  to  $70^{\circ}$ .

To answer this test question you need to know how to write a good experimental conclusion. To write a good experimental conclusion you must use all of the evidence to support your answer to the experiment question. You must use evidence and not your opinions.