

**Science 9**  
Unit 3: Static Electricity  
Worksheet 2: Laws of Electric Charge



**Force** is a push or a pull

**Electric force** is a push or a pull between charged objects

**Action at a distance force** refers to a force that can have an effect without touching

Observation of electrostatic effects gives the **3 Law of Electric Charges**:

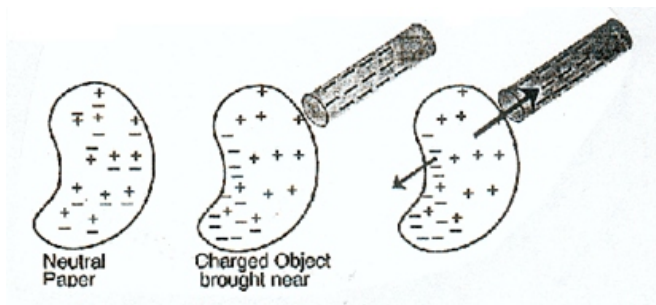
1. Opposite charges attract



2. Like charges repel



3. Charged objects can attract some neutral objects.



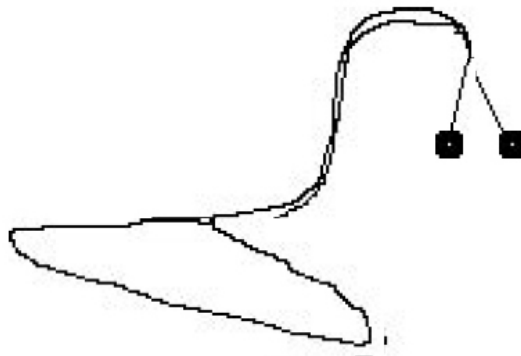
How does a positively charged rod attract a neutral object?

When a + charged rod is put near neutral object, \_\_\_\_\_ is induced on the side of the object near the rod and \_\_\_\_\_ is induced on the side away from the rod. The rod can attract the neutral object because \_\_\_\_\_ between rod and - induced charge > the \_\_\_\_\_ between rod and + induced charge.

## PART A: Multiple Choice

1. We are led to believe that there were two kinds of charge because we are able to
  - (A) isolate them in separate containers.
  - (B) see two effects, attraction and repulsion.
  - (C) detect different weights for the same object.
  - (D) separate electrons and protons.
2. Which of the following objects are attracted by a positively charged object?
  - (A) only positively charged objects
  - (B) only negatively charged objects
  - (C) only neutral objects
  - (D) neutral and negatively charged objects
3. Two objects have collected static electricity with the same charge. What would the objects do when placed near each other?
  - (A) repel
  - (B) attract
  - (C) nothing
  - (D) stick together

Use this diagram of a homemade electroscope to answer the next **two** questions. The circles are Cheerios that will take a static charge.



4. In the diagram, the Cheerios are apart. What does that indicate about the charge on the Cheerios?
  - (A) One Cheerio is positive, the other is negative.
  - (B) Both Cheerios are negative.
  - (C) Both Cheerios are positive.
  - (D) The Cheerios have the same charge.
5. Why would a comb that had been run through hair touch one cheerio and cause the two Cheerios to come together. The comb had...
  - (A) a negative charge.
  - (B) a positive charge.
  - (C) a different charge than the Cheerios already had.
  - (D) the same charge as the Cheerios already had.

6. What does the “Law of Electric Charges” state:
- (A) Like charges repel, and unlike charges attract one another
  - (B) Like charges attract, and unlike charges repel one another
  - (C) Like charges do not respond to each other, and unlike charges attract one another
  - (D) Like charges repel each other, and unlike charges do not respond to each other
7. A repelling force must occur between two charged objects under which conditions?
- (A) charges are of unlike signs
  - (B) charges are of like signs
  - (C) charges are of equal magnitude
  - (D) charges are of unequal magnitude
8. You rub a balloon on your hair. The balloon then sticks to the wall. Which law of electric charge does this demonstrate?
- (A) charges attract neutral
  - (B) like charges attract
  - (C) like charges repel
  - (D) unlike charges attract
9. The laws of electric charges include all of the following, EXCEPT...
- (A) opposite charges attract each other
  - (B) opposite charges repel each other
  - (C) similar (like) charges repel each other
  - (D) charged objects attract neutral objects
10. Which of the following does not reflect the laws of static charge?
- (A) Like charges repel
  - (B) Opposite charges attract
  - (C) Neutral charges repel
  - (D) Neutral objects are attracted to charged objects

**PART B: WRITTEN RESPONSE**

1. The picture below shows how positive and negative charges respond to each other. They are following the law of electric charges. Based on the picture below, state the law of electric charges. [4]

- (i) Negative charges **circle one** ~~attract~~/**repel** negative charges.

- (ii) Positive charges **circle one** ~~attract~~/**repel** positive charges.

- (iii) Negative charges **circle one** ~~attract~~/**repel** positive charges.

- (iv) Positive charges **circle one** ~~attract~~/**repel** neutral ob



2. During an experiment working with three charged objects, the following observations were made and recorded:

- \* Object A attracts object C
- \* Object A repels object B
- \* Object B attracts object C

Determine the possible charges of the three objects. Justify your answers.

[2]

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3. What is the definition of an electric force?

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4. According to the laws of static charge, explain how:

(a) like charges react

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(b) opposite charges react

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(c) neutral objects react to charged objects

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5. A positively charged object is brought near another object. If the two objects repel, what is the charge on the second object?

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6. An unknown material is rubbed with silk and becomes charged. Explain how you could use a negative acetate strip or a positive glass rod to determine the type of charge on the unknown material.

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