

Goal • Apply your knowledge of electric charge from the chemistry unit by designing an experiment.

Question

How can you make an empty pop can roll the greatest distance without touching it?
(Brainstorm)

A ramp, put the empty pop can on the top of the ramp and let it go

Blow on the empty pop can

Group Members

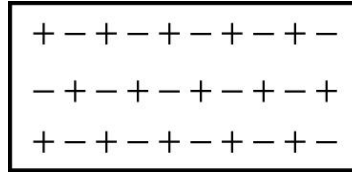
1. Serena
2. Makena
3. Carn

Group Name

Goal • Review your understanding of charge transfer.

What to Do

Use the following diagram to answer question 1–3. Use (–) to represent negative charges and (+) to represent positive charges.

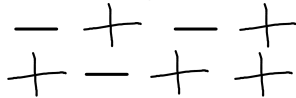


1. The diagram shows represents a neutral solid object. What is the relationship between the number of positive and negative charges in a neutral object?

The protons and the electrons are equal

2. When the above neutral object is rubbed with a material, it becomes positively charged.

(a) Draw a new diagram that represents the object with a positive charge.



(b) How do the number of positive charges compare to the original diagram?

Instead of having an equal amount of protons and electrons, there are more protons in this diagram

(c) How do the number of negative charges compare to the original diagram?

Instead of having equal an equal amount of protons and electrons, there are less electrons in this diagram

3. When the neutral object is rubbed with a different material, it becomes negatively charged.

(a) Draw a new diagram that represents the object with a negative charge.

(b) How do the number of positive charges compare to the original diagram?

Instead of having the same amount of protons and electrons, this diagram has less protons then electrons

(c) How do the number of negative charges compare to the original diagram?

Instead of having the same amount of protons and electrons, this diagram has more electrons then protons which means it a negative charge



Goal • Review your understanding of the laws of static charge.

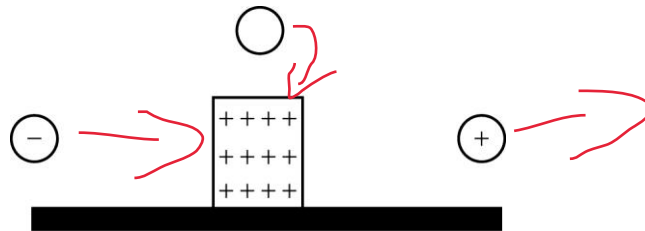
What to Do

Complete the following sentences using the following terms. Each term may be used more than once.

attracts, repels, positive, neutral, negative

1. A negative charge is repelled by a negative charge.
2. A positive charge attracts a negative charge.
3. A charged object attracts a neutral object.
4. A negative object attracts an unknown object. The unknown object could be positive or neutral.
5. A positive object repels a positive object.

Use the diagram below to answer question 6.

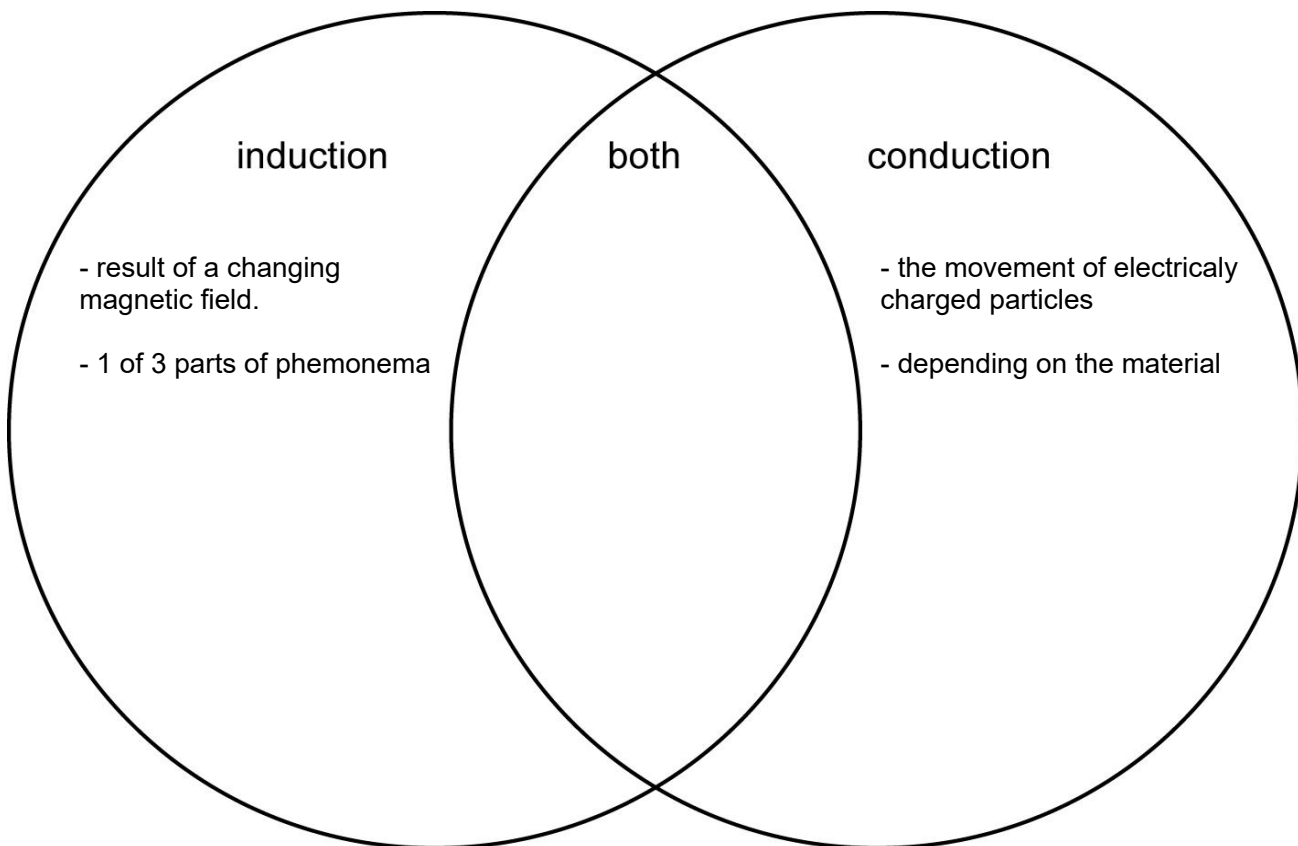


6. A positively charged object is attached to a table as shown. Use an arrow to indicate the direction of the force on the negative (-), positive (+), and neutral (no sign) charges placed near the object on the table.
7. Use the words "increased" or "decreased" to complete each of the following statements.
 - (a) To increase the electric force between two charged objects, the distance separating the two charges should be decreased.
 - (b) To increase the electric force between two charged objects, the amount of charge on one or both objects should be increased.
 - (c) To decrease the electric force between two charged objects, the distance separating the two charges should be increased.
 - (d) To decrease the electric force between two charged objects, the amount of charge on one or both objects should be decreased.

Goal • Compare and contrast conduction and induction.

What to Do

Complete the following Venn diagram. List points that are true of induction on the left side. List points that are true of conduction on the right side. List points that are true of both induction and conduction in the middle.



Goal • Review your knowledge of electric charge and its interaction with conductors, insulators, and electroscopes.

What to Do

Answer the questions that follow.

1. Classify the following items using an X.

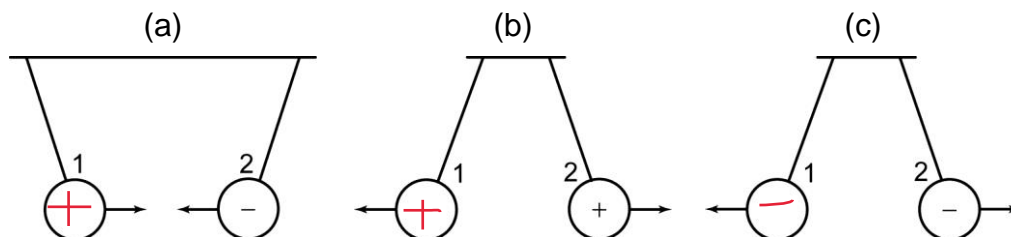
	Conductor	Insulator
Human body	X	
Air		X
Wood		X
Rubber		X
Plastic		X
Aluminum	X	
Silver	X	
Wool		X
Copper	X	
Iron	X	
Fur		X

2. Using the list of words below, complete the following sentences. Each word may be used more than once.

negative, negatively, positive, positively, opposite

- (a) opposite charges are unlike charges.
 (b) Two like charges are either both negative or both positive.
 (c) If two opposite charges are brought together, they will be attracted.
 (d) If a positively charged object is brought near a positively charged electroscope, the leaves will separate.
 (e) If a negatively charged balloon is brought near a positively charged rod, the balloon is attracted to the rod.

3. The diagram below shows two charged pith balls hanging on thin threads. One ball in each diagram is shown with either a positive (+) or a negative (−) charge. The arrows indicate whether the two balls are attracted or repelled. On the diagram, indicate the charge on the blank balls.



Question

How can you make an empty pop can roll the greatest distance without touching it?

Hypothesize

Write a hypothesis for your experiment.

I think that the pop can will go a bit of a distance, but we dont know what we are doing yet so it might work or it might not.

Materials

- fur or wool
- rubber rod
- plastic or glass rod
- plastic golf tube
- balloon
- empty pop can
- plastic wrap and/or plastic bags

Procedure

1. With your group of 3. Include any or all of the above materials in the design of your experiment. Write your procedure below.

Balloon, Fur and a Can

We used the balloon and rubbed it against the fur, then we put the balloon near the can and it follows.

2. Test the procedure and revise it as necessary. If you touch the can during the race, the can will be disqualified.
3. Write the revised procedure below. Have your procedure approved by the teacher. You will use this procedure in a race against your classmates.

We will get a piece of the fur and the blown up ballon. Before the race starts we will be rubbing the balloon against
the fur very intensely to create static charge. Then when the race starts, we put the balloon infront of the can
and it eventually follows it. We will try to do the furthest distance.

Observations

As your group tests each part of its procedure, write down your observations below. You will need to refer to these observations when you decide which method of racing your can will give you the best chance of winning.

We only decided on one way of doing the race which was the fur and the balloon because it was the only method that worked the best. We saw that 95% of the class used the fur method because i dont think there's another way that you can do it better.

Results

Record the results of the race. Describe briefly how each group (including your own group) moved its race can and how well each method worked.

Mostly everyone used the same method and it worked very well, for the one who didnt use that method they didnt succeed. For our race it was going good at the start but then it started going sideways, we couldve kept going but it was already out of ' power '

Conclusion

Draw specific conclusions about your group's method of moving the pop can. If your group's method worked, explain why. If your group's method did not work or did not work well, explain why.

Our method worked because by rubbing the balloon against the fur it created a lot of you can say power to move the pop can, in our opinion it worked the best out of all the other options we had

Analyze

1. Was your original hypothesis correct? Explain.

It wasnt necessarily correct but we did predict we would do moderately good which was true.

2. Evaluate your group's approach to this activity. What aspects of your group's procedure and interaction would you change in future investigations?

Maybe if we had our group of three because one of the people in our group left so it was more work for only two people

Group Reflection – Collaboration Fluency

“Establish”

1. Did your group stick to the original agreed upon non-negotiables? Explain

Yes we did stick to it, we worked together like we said we would.

“Envision”

2. Did your group stick to the original plan? Explain

We didnt really have a stuck plan but once we found out what we were doing we stuck to it.

“Execute”

3. Did your group execute the plan? Explain

Yes we did because we stuck to the idea we were going to do and it we executed it well.

“Examine”

4. How did the collaboration go? Explain

It went well, it would have been better if we had a full group but i think us two did very well together

Self-Reflection – Collaboration Fluency

“Establish”

5. Did you stick to the original agreed upon non-negotiables? Explain

Yes we did, we were going to find an idea and stick to it which we did.

“Envision”

6. Did you stick to the original plan? Explain

Yes we did stick to the original plan, even though it didnt really work at first we kept trying and trying, it eventually worked.

“Execute”

7. Did you execute the plan? Explain

yes we did even though we didnt win the contest, it still went very far.

“Examine”

8. How did the collaboration go? Explain

In my opinion the collaboration went very well and I dont think i couldve done this by myself
