Name:_____.

Investigation: Charging by Contact

In this investigation, you will use a pith ball apparatus to determine the kind of charge transferred from one object to another.

Question

How can we determine the kind of charge transferred to a neutral object when a charged object touches it?

Prediction

(a) Use the laws of electric charges to predict what kind of charge is transferred from each object to a pith ball apparatus.

a negative object transfers a negative charge - object becomes -.

a positive object takes a negative charge - object becomes +.

Observations

Record your observations in the table below.

Action	Observations
Charged ebonite rod brought close to, but not touching, the pith ball.	attract
Charged ebonite rod touches the pith ball and then brought close.	repels
Charged Lucite rod brought close to, but not touching, the pith ball.	attract
Charged Lucite rod touches the pith ball and then brought close.	repels

Analysis and Conclusion

(b) Write a statement about the transfer of electric charge when the pith is touched by a negatively charged object.

electrons flow into the pith ball creating a negative charge.

(more negatives than positives).

(c) Write a statement about the transfer of electric charge when the pith is touched by a positively charged object.

electrons flow out of the pith ball creating a positive charge.

(less negatives than positives).

(d) Ideally the pith ball is repelled by the charged ebonite rod after being touched. With the aid of a labeled diagram, use your knowledge of electrostatics to explain why this happens.

(e) Ideally the pith ball is repelled by the charged Lucite rod after being touched. With the aid of a labeled diagram, use your knowledge of electrostatics to explain why this happens.

(f) Write a statement to compare the movement of electric charges in the ebonite rod and the Lucite rod.

ebonite: electrons move out of the ebonite rod.

lucite: electrons move in to the lucite rod.

the rods remain charged because not enough electrons have moved to cause neutralization

Making Connections

1. If your hands were negatively charged and you touched a neutral doorknob, in which direction would the negative charges move? Explain your answer.

electrons move from hand to door knob, helps to neutralize the hand (neutral objects are preferred - lowest energy)

2. How do you think charging by contact could be used to paint a car?

charge the paint (+ or -), or charge the car (+ or -) or charge the car and the paint to opposite charges - attract the paint to the car

3. State some safety precautions that you should take if caught outside in a lightning storm.

- don't carry metal conducting lightning rod type objects
- if possible wear crocs - insulation foot gear
- roll up you sleeping bag and sit on it with your feet off the ground
- stay away from high objects (trees)

4. Use the table below to predict what would happen if two pith ball apparatuses were charged and brought close together. (If there is time, try this.)

Pith balls	Prediction
Charged alike	
Oppositely charged	
One is charged and the other is not	