Name _____ # _____
Section_____

STATIC ELECTRICITY

REGENTS RULES – Full Sentences for FULL CREDIT

Static electricity consists of charges trapped in a body moving randomly.
In order to understand static electricity we need to know **three principles**:

1. _____2. _____

3. _____

Neutral objects become positive by _____ _____

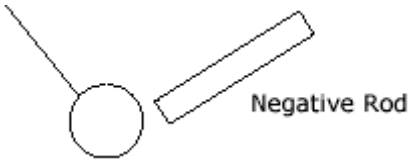
Neutral objects become negative by _____ _____

In this experiment we will be charging:

· **black rubber rods** are charged with **_____-** BLACK ROD becomes negative

· **And glass rods are charged with _____ - GLASS ROD becomes positive**

We will also being using **pith balls** in this lab. These pith balls have a Styrofoam center with a coating of metallic paint. The pith ball is suspended by silk thread, which keeps the pith ball from being grounded.



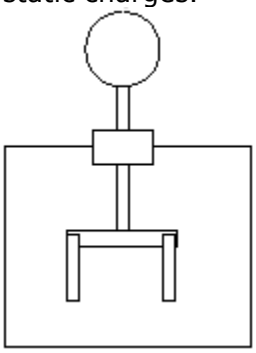
Before contact pith ball is neutral

Show the charge arrangement in the pith ball when the negative rod comes near.

What happens when the rod touches the pith ball?

_____

Objective
During this investigation you will use pith balls and an electroscope to investigate some behaviors of static charges.



a) What is the purpose of the white plastic collar on the electroscope?

b) Label the leaves of the electroscope shown on the left.

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Procedure

A. Charging a Pith Ball

1. Rub the rubber rod with wool. **SLOWLY** bring the rod close to a suspended pith ball.

   Explain why pith ball is first attracted to the rod and then repelled by it.

_____

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2. What would the final charge on the pith be if you used a positive charged rod and followed the same procedure as before?

Explain _____

_____

B. Charging the Electroscope by Conduction

RUBBER ROD - CONDUCTION

Charge the rubber rod by rubbing it with wool. Touch the rubber rod to the top of the electroscope.

a) What is the charge of the electroscope? _____

b) What kind of charge moved between the rod and electroscope to give the electroscope that charge?

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c) In which direction did the charge move? _____

_____

d) Why do the leaves of the electroscope diverge?

_____

e) Why do the leaves remain diverged, even when the rod is pulled away?

_____

f) Touch the top of the electroscope with your finger.

Where did the electrons move to make the electroscope neutral?

_____

GLASS ROD - CONDUCTION

Charge the glass rod by rubbing it with silk. Touch the glass rod to the top of the electroscope. (KEEP TRYING UNTIL THE LEAVES FINALLY DIVERGE)

a) What is the charge of the electroscope? _____

b) What kind of charge moved between the rod and electroscope to give the electroscope that charge?

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c) In which direction did the charge move? _____

_____

d) Why do the leaves of the electroscope diverge?

_____

e) Why do the leaves remain diverged, even when the rod is pulled away?

_____

f) Touch the top of the electroscope with your finger. Where did the electrons move to make the electroscope neutral?

_____

Summarize your observations involving charging the electroscope by conduction.

D. Charging the Electroscope by induction

1. Bring a negatively charged rod (BLACK) **NEAR but not touching the electroscope**.
2. Remove the rod.
3. Again bring the charged rod near the electroscope. With the rod still close, briefly touch your finger to the electroscope. With the rod still held close, remove your finger.
4. Now remove the charged rod.
5. Test the charge on the electroscope by bringing a negatively charged rod near the electroscope. What is the charge of the electroscope?

   _____

6. Explain why the electroscope has this charge.

7. What would the charge of the electroscope be if you used a positive rod in this last experiment?

8. Explain why the electroscope would have this charge if you used a positively charged rod.

9. Compared with the charging body, what is the charge on an electroscope when it is charged by

   conduction? _____ (Answer "The same " or " Different")

   induction? _____ (Answer "The same " or " Different")

10. Ball A and B below start out neutral. A **negatively charged rod** is brought near the two spheres and then ball B is moved away. The charged rod is removed. What charges do you think will exist on Ball A and B? **Explain**.