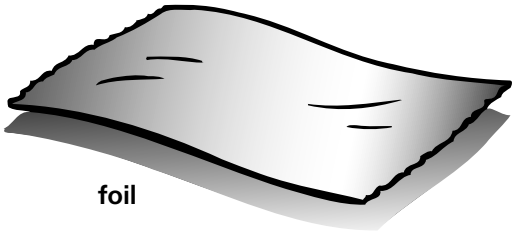
Chapter Science Investigation Name _____

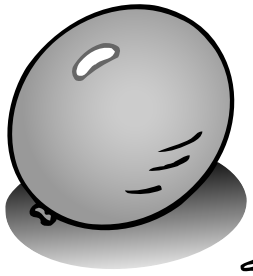
Making an Electroscope

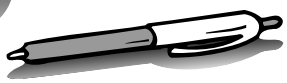
What You Need

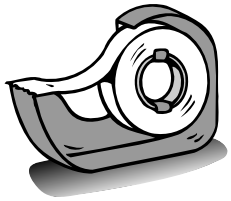

small glass jar

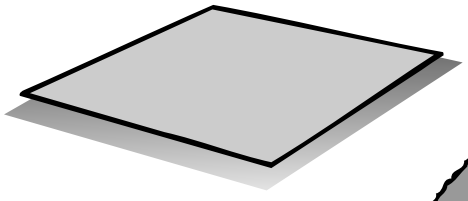

foil

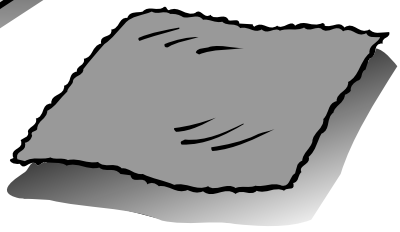

foil wrapper

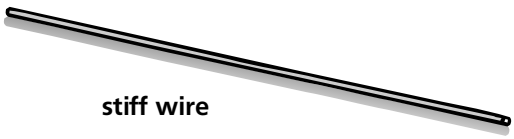

balloon

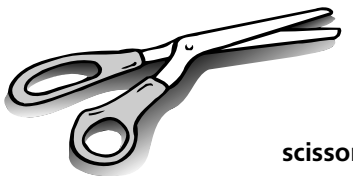

plastic pen


tape


heavy cardboard


a piece of silk or wool


stiff wire


scissors

Find Out

Do this activity to learn how an electroscope can detect static charge.

Process Skills

Observing
Predicting
Defining Operationally
Hypothesizing
Experimenting

Time

- 45 minutes on a dry day
- 15 minutes on a humid or rainy day

What to Do

1. Turn the jar over and trace the opening of the jar on the cardboard. Cut around your marks to make a cardboard lid for the jar. Make sure the lid is a little bigger than the jar opening so it will not fall into the jar.

2. Push the wire through the center of the cardboard lid. Bend the bottom of the wire over to make a hook at the end. Wrap several layers of tape around the wire just above the cardboard lid so the wire cannot move down through the lid. Cut to fit and tape a foil wrapper over the bent end of the wire.

3. Put the bent end of the wire in the jar and tape the cardboard lid to the jar.

4. Crumple the foil into a ball and stick it on the top end of the wire.

5. Place the pen near the foil ball. **Observe** what happens.

6. Now, charge the pen by rubbing it with a piece of silk or wool. Place the pen near the foil ball. **Observe** and **record** what happens to the wrapper.

7. **Predict** what will happen if you charge the balloon and put it near the foil ball. **Test** your prediction.

8. Write a **hypothesis** about what will happen to the wrapper if you repeat this activity on a rainy day. **Test** your hypothesis on a rainy or a humid day.

Hypothesis: _____

_____

_____

Detecting Static Charge		
Variables	**On a Dry Day**	**On a Humid Day**
What happened when the pen was placed near the foil ball?		
What happened when the pen was charged and then placed near the foil ball?		
What happened when the balloon was charged and placed near the foil ball?		

Conclusions

1. How do you know when the pen is electrically charged?

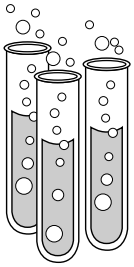
2. Did the foil wrapper react differently at different times? Describe.

3. Describe how the electroscope reacted on a wet day. Try to explain why this happens.

New Questions

1. Imagine it is a very dry day, and when you comb your hair, static electricity makes your hair stand up. How could you stop this from happening?

2. Why might someone use an electroscope?



Name _____

ACTIVITY

Opposites Attract, Likes Repel

What happens when you bring balloon 1 near balloon 2?

After rubbing both balloons with a wool cloth, what happens when you bring balloon 1 near balloon 2?

Why do you think the balloons acted this way?

What do you **predict** will happen if you bring the wool cloth near the balloons?

What happened when you brought the wool cloth near the balloons?

Record what happens when you rub the balloons with wool and move them toward these objects:

Bits of paper

Your hair

The wall

Why did the objects act this way?

Name _____

Conclusions

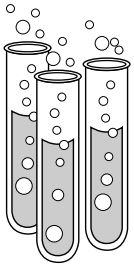
1. Did the balloons act the same every time? If not, why do you think they sometimes acted differently?

2. Think about the objects that moved. Did you have to touch the objects together to make them move? Why?

Asking New Questions

1. How did you make electrons move from one type of matter to another in this activity?

2. Thales and William Gilbert inferred that static electricity existed, based on their observations. List one **observation** and one **inference** you made in this activity.



Name _____

ACTIVITY

Magnetic Fields

Draw the combinations of magnets that worked in Step 1.

What happens when you place iron filings on the paper?
Sketch what you see.

What happens to the iron filings when you use two magnets?
Sketch the different combinations you use and the results.

Name _____

Conclusions

1. Which ends of the magnets pulled toward each other? Which ends pushed away?

2. Where did most of the iron filings clump together? What does this show about the magnet?

3. Which parts of the magnet would be best for picking up paper clips?

Asking New Questions

1. **Look** at your sketches of the iron filings. How do you think the magnets pushed or pulled each other without touching?

2. Suppose that you have one bar magnet with marked poles and one with unmarked poles. How could you find out which pole on the unmarked magnet is *N*?