**Do the Lab stations on the following pages and then come back to this page to answer the questions below.**

1. What part of the atom is transferred to provide static charge?
2. What is the charge on an object if the number of protons equals the number of electrons?
3. What is the charge on an object if it gains electrons?
4. What is the charge on an object if it loses electrons?
5. What happens when two objects with the same charge are placed near each other?
6. What happens when two objects with opposite charges are placed near each other?
7. What happens when a neutral object is placed by either a positively charged object or a negatively charged object?
8. A rubber rod can be charged negatively when it is rubbed with wool. What happens to the charge on the wool? Why?
9. After a comb is rubbed on a wool sweater, it is able to pick up small pieces of paper. Why does this occur?
10. A pith ball is a small sphere made of a light material, such as plastic foam, often coated in a layer of aluminum and graphite paint. How could you determine whether a pith ball that is suspended from an insulating thread is neutral, is charged positively, or is charged negatively?

**Lab Station 1 – Observing Electrical Force**

What happens when a plastic ruler is rubbed with wool (or a plastic bag) and then brought near a pile of paper scraps?

**Procedure:**

1. Place 15-20 scraps of paper from a hole punch on a table.
2. Take the plastic ruler and rub it with a piece of wool.
3. Bring the ruler close to the pieces of paper
4. Observe the effect the ruler has on the scraps of paper.

**Analysis**

1. What happens to the pieces of paper when the ruler is brought close to them?
2. What happens to the pieces of paper when they come in contact with the ruler?
3. Did you observe any unexpected results when the ruler was brought close to the paper scraps? If so, describe.

**Critical thinking**
1) When the ruler and wool are rubbed together, the ruler gains electrons.

1. What is the charge on the ruler?
2. What is the charge on the wool?

2) What is the charge on the pieces of paper on the table?

3) What happens to the negative charges in the piece of paper when the ruler is brought next to them?

4) Can a negative object attract a negative object?

5) Can a negative object attract a positive object?

6) Can a negative object attract a neutral object?

7) What force is acting on the pieces of paper before the ruler is brought close to them?

8) What can you infer about the electrical force compared to gravity, when the ruler is placed next to the pieces of paper?

**Station 2 – Observing static electricity on a balloon.**

**Procedure 1**

1. Blow up two balloons.
2. Rub each balloon in your hair for about 30-45 seconds
3. Place the balloons next to each other WITHOUT TOUCHING THEM TOGETHER
4. Observe the interaction of the balloons.

**Analysis:**
1) Each balloon gained electrons from your hair.

1. What was the charge on each balloon?
2. What was the charge on your hair?

2) What happened when you placed the charged balloons next to each other?

3) Did you notice anything happening to your hair when you charged the balloons? If so, describe what happened and explain why it did.

**Procedure 2**

1. Charge up one of the balloons on your hair again.
2. Place the balloon against the wall.
3. Observe.

**Analysis**

1. What was the charge of the wall?
2. What happens to the negative charges in the wall when the balloon is brought near them?
3. What did you observe when you placed the balloon against the wall?

**Critical Thinking**

1. What happens when two negative charged balloons are placed next to each other?
2. What happens when two positively charged hairs are next to each other?
3. Can a negative charged balloon attract a neutrally charged wall
4. What two forces are acting on the balloon when it is stuck to the wall? Which is stronger?

**Station 3 – Using tape to explore electric charges**

**Procedure 1**

1. Fold over about 5mm on the end of the tape for a handle.
2. Tear off a strip of tape about 8-10 cm long.
3. Stick the strip on a dry smooth surface (our lab table)
4. Repeat the procedure with a second strip of tape.
5. Rub each of the pieces of tape into the table for 1 minute.
6. Quickly pull both strips off the table and bring them next to each other.
7. Observe.

**Analysis**
1) What is true about the charges on each piece of tape, since they were both prepared in the same way?

2) What did you observe when they were placed next to each other?

3) Since both strips gained electrons from the table, what was their charge?

**Procedure 2-**

1. Stick one strip of tape on the desk and place the second strip on top of the first.
2. Pull the two strips of tape off together at the same time.
3. Rub the strips of tape with your fingers, until they are no longer attracted to your hand.
4. Quickly pull the two strips apart
5. Put the strips of tape next to each other
6. Observe.

Analysis

1) What did you observe?

2) Why did the strips behave the way they did?

Critical Thinking

1. What happens when two negatively charged tape strips are placed near each other?
2. What happens when a negatively charged tape strip is placed next to a positively charged tape
strip?

1. What would happen if a negatively charged tape strip was placed next to a tape strip that was neutral?