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Static Electricity Lab

Materials

1) scraps of paper from a hole punch
2) Plastic Rulers
3) Balloons
4) Scotch Tape
5) A Comb
6) Lightweight string
7) Salt & pepper

Lab 1- Observing electrical force...

Procedure:

1) Place 15-20 scraps of paper from a hole punch on the table.
2) Take a 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.

Questions

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 these results. _____
   _____

Critical thinking:

1) When the ruler and the wool are rubbed together, the ruler gains electrons.
   a. what is the charge on the ruler? _____
   b. 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? Why or why not? _____
   _____
5) Can a negative object attract a neutral object? _____
6) What force is acting on the pieces of paper before the ruler is brought close to them? _____
7) What can you infer about the electrical force compared to gravity, when the ruler is placed next to the pieces of paper? _____

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Lab 2 - Observing static electricity on a balloon.

Procedure 1:

1) Blow up two balloons.
2) Rub each balloon in your hair for about 30 to 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.
   a. what was the charge on each balloon? _____
   _____
   b. 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 again with your hair.
2) Place the balloon against the wall.
3) Observe what happens.

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 negatively charged balloons are placed next to each other? _____
   _____
2) What happens when two positively charged hairs are next to each other? _____
   _____
3) Can a negatively charged balloon attract a neutrally charged wall? _____
   _____
4) What two forces are acting on the balloon when it is stuck to the wall and which is stronger? ___
   _____

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Lab 3- Using Tape to explore electric charges.

Procedure 1:

1) Tear off a strip of tape that is 8 to 10 cm long.
2) Stick the strip on a dry smooth surface, such as a lab table.
3) Repeat the procedure with a second strip of tape.
4) Rub each of the pieces of tape into the table for 1 minute.
5) Quickly pull both strips off the table and bring them next to each other.
6) Observe what happens.

Analysis:

1) What is true about the charges on each piece of tape, since they both were prepared 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 strip of tape.
2) Pull the two strips of tape off the table 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 what happens.

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 charge tape strip is placed next to a positively charged tape strip? _____
3) What would happen if a negatively charged tape strip was placed next to a tape strip that was neutral? _____
4) What is true about the charges on each piece of tape, since they both were prepared the same way? _____
5) What did you observe when they were placed next to each other? _____
6) Since both strips gained electrons from the table, what was their charge? _____
7) What is true about the charges on each piece of tape, since they both were prepared the same way? _____
8) What did you observe when they were placed next to each other? _____
9) Since both strips gained electrons from the table, what was their charge? _____

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Lab 4- charging a comb

Procedure 1:

1) Charge up two tape strips to give them opposite charges by rubbing one on wool and sticking the other to the table.
2) Stick the handle of each strip to the edge of a table.
3) Rub a comb through your hair and bring it near the end of one strip and then the other
4) Observe what happens.

Critical Thinking

1) The comb gains electrons, so what charged does it acquire. _____

2) Why did the pieces of tape behave the way they did when they were brought near the comb? ___
_____

3) Which piece of tape is negative (the top or bottom)? _____

4) Which piece of tape is positive (the top or bottom)? _____

5) What would have happened if the comb used was neutral and had no charge? _____
_____

Procedure: Dancing Balloon

1. Blow up 2 balloons and tie each one closed. Tie a long thread or string onto the end of each balloon.
2. Give each balloon a static charge by rubbing it with your hair as in part A.
3. Hold each balloon by the end of the thread and try to bring the balloons close to each other. What happens? _____ Why? _____

Procedure: Salt and Pepper

1) Sprinkle some salt onto a plate or tabletop.

2) Bring a charged balloon near the salt. What happens? _____
Why? _____

3) Then, sprinkle some pepper onto the table so that you have a mixture of salt and pepper. How do you think you might be able to separate the salt from the pepper? _____
_____

4) Bring your charged balloon near the pile of salt and pepper particles. What happens? Which pieces were picked up more easily? Is this a good way to separate salt and pepper if they accidentally get mixed. _____
_____
_____

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