Electrostatics Lab Stations

Station 1: CHARGED OBJECTS AND DISTANCE

CAUTION: ***Inform your teacher if you are allergic to latex.***

Procedure:

1. Inflate **two balloons** to the same size and tie off**.** Attach a ½-m length of **string** to each balloon.

2. Rub one balloon back and forth on your shirt six to eight times, causing it to become charged. Hang it from a cabinet, table, or other support by the string with a piece of **tape.**

3. Rub the second balloon the same way and then suspend it from its string.

4. Observe Slowly bring the second balloon toward the suspended one. How do the balloons behave? Tape the second balloon so it hangs by its string next to the first balloon but does not touch it.

5. Observe Bring your hand toward the charged balloons. What happens?

Analysis

6. What did you observe as the two balloons were brought near each other?

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7. What happened as your hand was brought near the balloons?

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8. Critical Thinking With what two objects have you previously observed similar behaviors of action at a distance?

Station 2: ELECTROSTATIC FORCE

Procedure

CAUTION: *Inform your teacher if you are allergic to wool.*

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

Analysis

5. What happens to the pieces of paper when the charged ruler is brought close to them? What happens to the pieces of paper that come in contact with the charged ruler?

6. Did you observe any unexpected results when the charged ruler was brought close to the paper scraps? If so, describe these results.

7. What forces are acting on the pieces of paper before the charged ruler is brought close to them? What can you infer about the forces on the paper after the charged ruler is brought near the paper?

8. **Critical Thinking** Based on your answers to the previous questions, form a hypothesis that explains the effect the charged ruler has on the scraps of paper.

Station 3: LIGHTNING SAFTEY

Carefully read through this website on lightning safety
https://www.noaa.gov/jetstream/lightning/lightning-safety

Select one of the safety suggestions that the National Oceanic and Atmospheric Administration (NOAA) lists as ways to stay safe from lightnings.

Write one paragraph (7-10 sentences) using your knowledge of electricity to a) explain what lightning is and b) explain why that safety warning would help keep you safe.

Station 4: JUMPING DISKS

Procedure

1. Tear off a sheet of plastic wrap about 30 cm by 30 cm.
2. Lay the plastic wrap on a clean surface and use the cotton cloth to make it smooth and flat.
3. Use the paper punch to cut small round disks from aluminum foil.
4. Place a small pile of aluminum foil disks in the center of the plastic wrap.
5. Slowly lift the plastic wrap by one end.
6. Observe and record the behavior of the aluminum disks.

Results

1. What did the aluminum pieces do first? Why?

2. Was the electrostatic force holding the aluminum to the plastic stronger or weaker than the force of gravity? How do you know?

3. What happened to the aluminum after a few seconds? Why?