

## 1 Background

When two objects are vigorously rubbed together, excess charges may move from one object to the other. This is called the triboelectric effect (*tribos* refers to the Greek word for “a rubbing”).

Benjamin Franklin defined the charge that is accumulated on glass, after it has been rubbed, to be positive.

## 2 Materials

- Scotch tape
- Rubber stoppers
- Plastic silverware
- Wooden ruler
- Glass graduated cylinder
- Metal rod
- Magnet
- Paper clip
- Paper, torn into very small pieces

## 3 Part I: Preliminary investigations

Take a piece of Scotch tape that is about 4–6 inches long and press it firmly against a smooth, unpainted surface (the desktop will do just fine). Peel it off quickly and let it hang off of your finger.

1. What happens as you bring any object towards the tape (for example, your hand or a pen)?
2. Now do the same thing to another piece of tape, and bring the two towards each other. What happens?
3. Does the distance between the tapes play any role in their interaction?

## 4 Part II: A Tale of Two Tapes

Take a piece of tape and press firmly on a surface, and write a “B” on it. Then take another piece of tape, press it *on top of* the other, and write a “T” on this one. Slowly pull them off the table (as one unit). When they are unstuck from the table, quickly pull the two apart. Do this again, so you have to sets of B and T tapes.

Describe what happens when the following things are brought near each other:

1. Two T tapes
2. Two B tapes
3. A T and a B tape

4. A T tape and a little piece of paper (a square of only about 5 mm on a side—or smaller)
5. A B tape and a little piece of paper
6. Two little pieces of paper (no tape involved)

## 5 Part III: Tapes and Things

Recharge your T and B tapes (or make some more if they aren't very sticky any more). Also, make a small pile of little pieces of paper.

Vigorously rub the following objects with a paper towel, then describe what happens as you bring them near each piece of tape and the pile of paper. You may need to periodically recharge your tape.

- Ceramic resistor
- Rubber stopper
- Plastic silverware
- Wooden ruler
- Glass graduated cylinder
- Metal rod
- Magnet
- Paper clip
- Any other object of your choice. Be creative! Have fun!

## 6 Part IV: Wrap-up

1. Describe a procedure that could tell you if an unknown object is charged or neutral.
2. Determine the charge on the T and B tapes.
3. When rubbed with the towel, what kind of charge accumulated on the objects in Part III?

## 7 Grading

You will not write a formal report for this lab. Instead, answer all questions and write down all of your observations. The writeup that you turn in must be typed, organized well, and must have your name and your lab partner's name.