

Preparing a “U” tape

Use a strip of tape about 20 cm long (about 8 inches, about as long as this paper is wide). Shorter pieces are not flexible enough, and longer pieces are difficult to handle. Fold under one end of the strip to make a non-sticky handle, as shown in Figure 14.51.



Figure 14.51 Fold under one end of a strip of tape to make a non-sticky handle.

HOW TO PREPARE A U TAPE

- Stick a strip of tape with a handle down onto a smooth flat surface such as a desk. This is a “base” tape.
- Smooth this base tape down with your thumb or fingertips. This base tape provides a standard surface to work from. (Without this base tape, you get different effects on different kinds of surfaces.)
- Stick another tape with a handle down on top of the base tape, as shown in Figure 14.52.

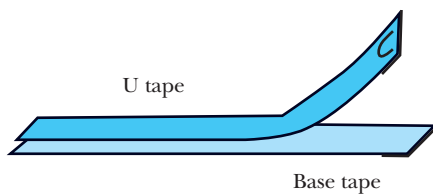


Figure 14.52 The U tape lies on top of the base tape.

- Smooth the upper tape down well with your thumb or fingertips.
- Write U (for Upper) on the handle of the upper tape.
- With a quick motion, pull the U tape up and off the base tape, leaving the base tape stuck to the desk.
- Hang the U tape vertically from the edge of the desk, and bring your hand near the hanging tape, as shown in Figure 14.53.

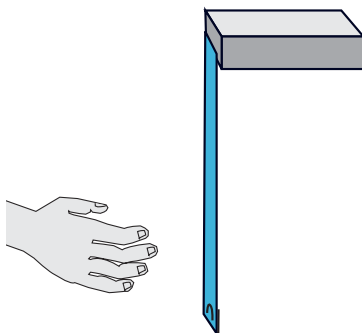


Figure 14.53 Bring your hand near a hanging U tape, and observe what happens.

- If the tape is in good condition and the room is not too humid, you should find that there is an attraction between the hanging strip of tape and your hand when you get close to the tape. If there is no attraction, remake the U tape.

Experimental technique: try to handle the tapes only by their ends while you are doing an experiment.

14.EXP.18 Interaction of two U tapes

(a) If U tapes are electrically charged, how would you expect two U tapes to interact with each other? Would you expect them to repel each other, attract each other, or not to interact at all? Make a prediction, and briefly state a reason.

(b) Make two U (“upper”) tapes by following the procedure detailed above. Make sure that both tapes interact with your hand. Hang one on the edge of a desk. Bring the second U tape near the hanging U tape. Since the hanging tape is attracted to your hands, try to keep your hands out of the way. For example, you might approach the vertically hanging tape with the other tape oriented horizontally, held by two hands at its ends. What happens?

You should have seen the two U tapes repel each other. If you did not observe repulsion, try remaking the U tapes (or making new ones, both from the same roll of invisible tape). It is important to see this effect before continuing further.