

Materials Testing: Plastics: Technical Notes

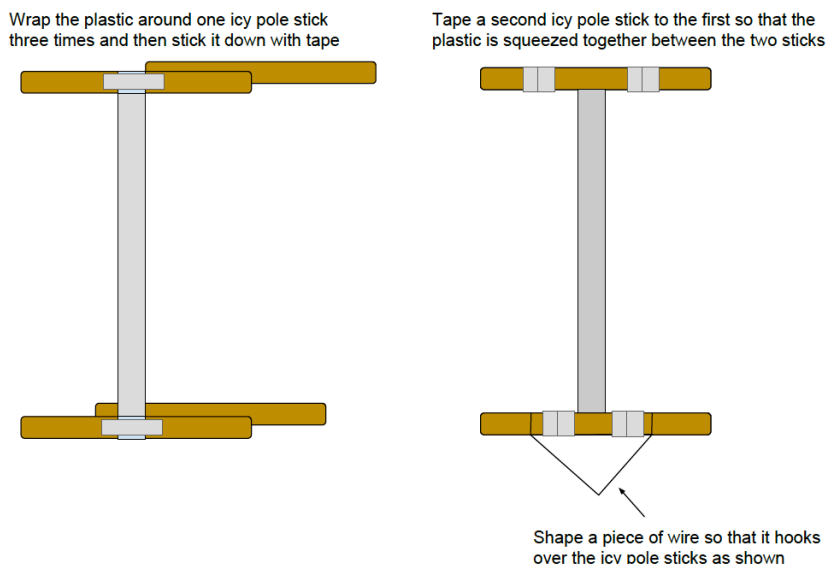
Equipment and materials

- Different plastic bags (3)
- Retort stand and clamp arm
- Paper clips or wire to make hook from which to suspend weights
- 1 pair Scissors
- Sticky tape (can be shared with other groups)
- 4 Icy pole sticks (possibly up to a total of 12 icy pole sticks if there is breakage)
- 2-3 bamboo skewers
- Weights (if possible, one kg of 100-gram weights per group)
- Ruler (and/or measuring tape)
- One rubber band (possibly more if there is breakage)
- One beaker or cup (approx. 8-10 cm diameter)
- Safety glasses/goggles

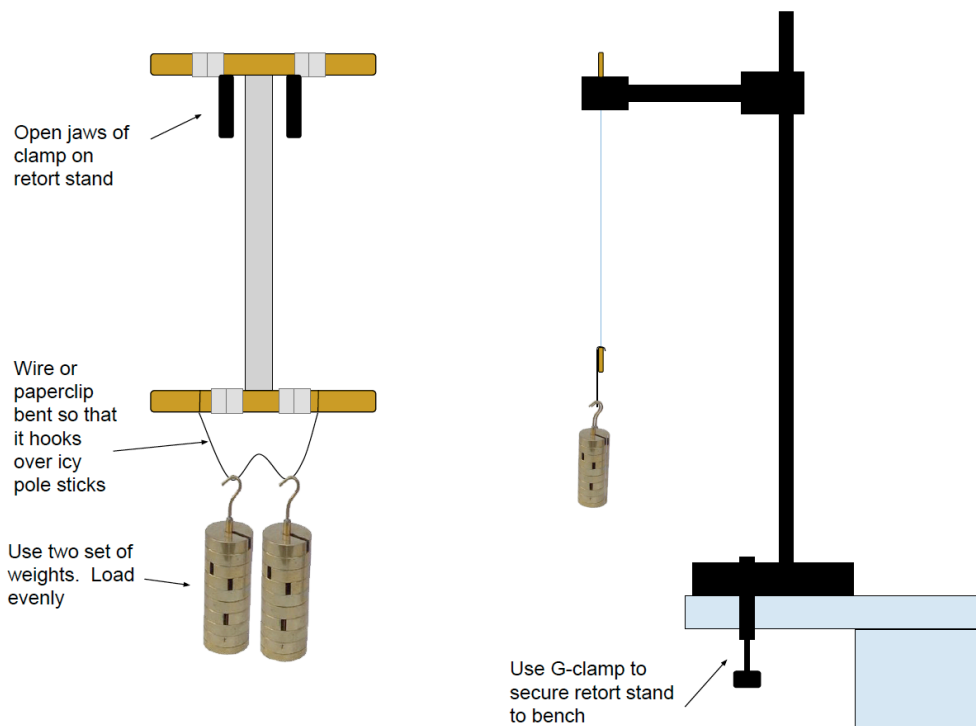
Experimental setup (for students)

Part 1

From the samples of plastic bags for testing, cut strips 30 cm long and 2 cm wide. Wind the plastic strip around the one icy pole stick as shown leaving 20 cm between the sticks. Use sticky tape to hold the plastic in place. Tape a second icy pole stick to the first one for extra support.



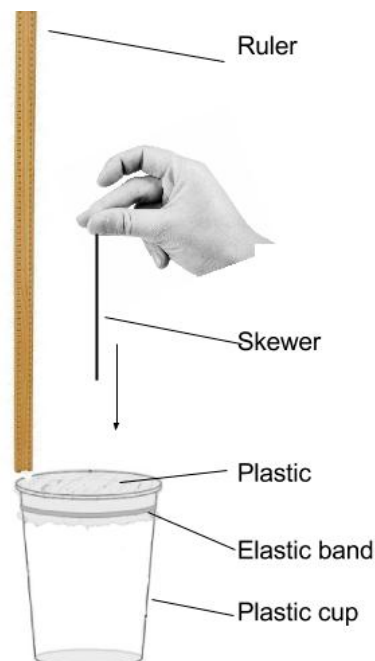
Suspend the top icy pole sticks from a clamp on a retort stand as shown below. Add weights to increase the load on 50 – 100 g at a time initially and 50 g at a time when you think the plastic is about to snap. Place something soft underneath the weights so that when the plastic breaks the weights do not crash to the ground. The supports on brass weights can be easily broken. Each time you add the load measure the distance between the top and bottom icy pole sticks i.e. the length of the plastic and also measure the width of the plastic at the midpoint of the length of plastic. Continue to add weights until the plastic test strip breaks.



Part 2

From the samples of plastic bags for testing, cut 15 cm squares – big enough to be stretched over the beaker/cup and held in place with a rubber band.

Stretch a sheet of plastic bag over the top of a plastic cup or beaker and secure it with a rubber band as shown. Drop a bamboo skewer, point down, onto the stretched plastic, from different heights.



Risk management

- The main hazard in Part 1 will arise when samples of plastic give way under load. Things may fly in unpredictable directions. Students must wear safety glasses/goggles, And also keep faces well away from the plastics when they are heavily loaded.]Keep clear if you think the plastic is about to snap. Set up a tray with something soft in it so the weights do not crash to the floor and keep feet clear.
- The main hazard in Part 2 are sharp objects. Care should be used with scissors to keep fingers clear while cutting. Both scissors and the bamboo skewers are sharp and care that they are not poked into skin or eyes. Students must wear safety glasses/goggles.

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