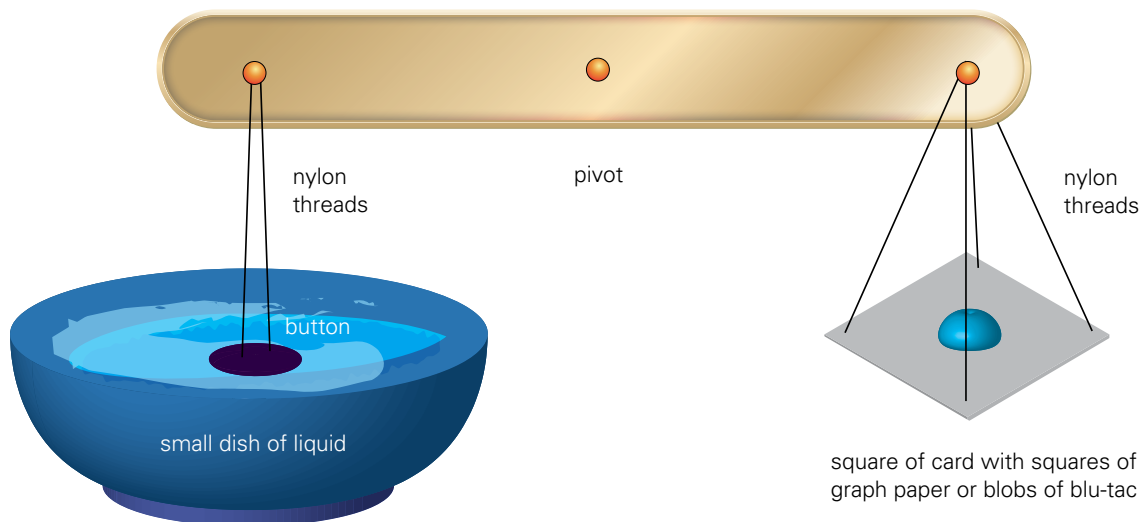


# Measuring surface tension



In the mid-1800s a lady called Agnes Pockels was washing up when she noticed that there were currents in the water when salts were added. She devised a method for measuring the surface tension in her kitchen which is the precursor to the Langmuir Trough used today (see page 6).

You can make a simple version of this called a 'Button Balance' and use it to measure the surface tensions of different liquids.

## You will need

- button (fairly plain and flat)
- lolly stick
- nylon thread or fishing line (this does not soak up water like other threads)
- 3 pins
- needle
- plasticine or blu-tac
- small dish for the liquid
- small square of card
- squares of graph paper (optional)
- water and washing up liquid

## What you do

Push the pins through the lolly stick so that they stick out on either side. You will need one near each end and one in the middle. The exact locations of the pins is not critical. It is helpful to have a cloth of some sort to help you push the pins through.

Thread the needle with nylon thread. Pass the thread through the button leaving a long loop. Remove the needle and tie a knot in the thread. Re-thread the needle and use the thread to pass

through the card near each corner to make a small tray. Tie off the thread leaving a long loop. (See diagram.)

Loop the thread of the button round one of the end pins on the lolly stick and the thread of the card tray round the other end. Use the middle pin as a pivot. You can hold this pivot in your hand or balance it on something like two baked bean cans. Stick plasticine as required to the lolly stick to balance the two ends.

Fill the small dish with water. Balance the button on it. Add either squares of graph paper or small pieces of blu-tac to the tray to balance the button. Record how much is required.

Add a drop of washing up liquid to the water and observe the change in surface tension. You will need to add more blu-tac or graph paper squares to balance it. Record the amount required this time.

You can use the button balance to measure the difference in surface tension between different liquids and solutions.

If you want a little more accuracy in your results, weigh a few pieces of graph paper on an accurate balance. Calculate how much each square that you are using weighs.

## Look here!

For more information about Agnes Pockels and what she achieved working from home see <http://tinyurl.com/35pfex>

For more experiments on surface tension which you can try at home see <http://tinyurl.com/2qkk3n>

Total area closest to a squash court

0.126 mm<sup>2</sup>

Area of single alveolus is

Answer to Box 2 ps