

14 forces

Which syringe is easiest to push?

Austria

Force is proportional to area if the pressure is constant

Follow these steps

1 Connect the apparatus (see diagram), filling the syringes and plastic tubing with water. The nozzle of each syringe should be of equal size to connect the plastic tubing.

2 Hold a syringe in each hand and press evenly on them.

3 Note which syringe plunger is easier to push down. You may need to swap the syringes from one hand to the other to notice the difference, because the difference in the strength of your hands may counteract the difference in force required.

4 Try varying the amount of water in the system. About a third full should work best. If there is too little water it can be difficult to detect the difference in forces required. The greater the difference in the size of the two syringes the easier it will be to detect the difference in force required.



You will need...

- ✓ two syringes of different sizes (e.g. 5 and 20 ml)
- ✓ some plastic tubing
- ✓ some water

What next?

This is a good introduction to hydraulics, as used in the brakes of a car, as the basic principle is the same.

So what happened?

The plunger of the smaller syringe is easier to push down. As the pressure remains constant the force required is proportional to the area of the syringe.