Take the U tube; hold closed end up. What happens? Attach rubber to open end, placing it below surface of water; lower the other end. What comes out?

Make barometer; graduate it. Keep record of readings.

Fill a wide-mouthed bottle with water, and invert it over water; lower a similar inverted bottle, apparently empty, into water; turn it round gradually with its mouth below that of the first bottle. What happens?

Fill a common syringe with water, noting what happens as it is filling with water; hold the nozzle against a piece of sheet rubber or against the finger; try to push the piston down.

Repeat the same experiment when the syringe has only air in it. Is air compressible? Test the same fact with the U tube with air in the closed end, pouring additional mercury into the open end. Try this also with water instead of air in the closed end.

Fit a piece of cardboard or glass plate to the mouth of a glass jar or tumbler; fill the jar with water, and invert it, holding the cardboard against the mouth of the jar. What happens? Repeat the experiment, but only half-fill the jar. What happens? (Invert it over a basin or bucket.)

Substitute a lamp-glass for the jar, fitting a card or plate to both ends. Repeat the experiment. Remove the top plate. What happens? Why?

Make a siphon (the open U tube, inverted, will do). Make a siphon of rubber tube only. Try the effect of raising the free end above the level of the water.

Make a hole at the highest point. What happens? Why?

Take two pieces of rubber cord, one stouter than the other, and two boards. Fasten each cord by a drawing-pin through its end to a board, and tie a loop of silk thread round the cord 12 in. from the drawing-pin. Attach a weight to the loop of one cord, and measure the stretched length. What stretches the cord? Remove the weight; take hold of the cord by the loop, and pull it horizontally until it is stretched to the same extent. What is the force of your pull?

Attach the same weight to the second cord, and repeat the experiments. Place both boards horizontally and connect the loops by a piece of silk; pull the boards apart until the first cord is stretched as much as it was at first. How much is the second cord stretched? What stretches each cord? (After a few experiments fresh pieces of rubber cord should be used.)

Attach a toy wagon to one of the cords. Incline the board at any angle, the fixed end of the rubber cord being at the highest part of the board. Put shot or weights into the wagon until the cord is stretched as much as it was before. What is the total weight of the wagon and shot? Call this the *weight*. What is the pull on the rubber cord? Call this the *power*.

Find the fraction or ratio, $\frac{\text{weight}}{\text{power.}}$

Measure the length of the inclined plane or board; measure the height of the raised end. Find the ratio or fraction, $\frac{\text{length}}{\text{height.}}$ Compare it with the ratio, $\frac{\text{weight}}{\text{power.}}$

Make or procure a simple pulley; mount it and pass a silk cord over it. Attach equal weights to each end. Substitute the rubber cord fixed as above for one weight. Hang the other weight to it. How much is the rubber stretched? Replace the silk cord on the pulley; note the result. Incline the board at different angles. What pull is exerted by the cord over the pulley? Repeat the experiment with the inclined plane; but, instead of attaching the wagon to the rubber cord, attach the power by a silk cord passing over a pulley fixed at the higher end of the plane. Find the ratios — weight/power, and length/height — as before.

Vary the inclination of the plane, and so get law of inclined plane.

At this stage pupils may be able to express their ideas of mass, weight, and force more or less clearly.

Repeat the last experiments. Detach the wagon from the silk cord, and keep it in position with the finger: with what force does it press against the finger? Remove the finger: what happens? What force drives it down the plane?

Take or make a large glass syringe with a wooden piston with cotton-wool or woollen-yarn packing. Take out the piston, and put a small glass marble or bulb inside the nozzle of the syringe. Make a small hole in the piston, and fit the top with a small valve of rubber sheeting.

Illustrate principle of common pump. The apparatus may easily be converted into a model of the common pump.