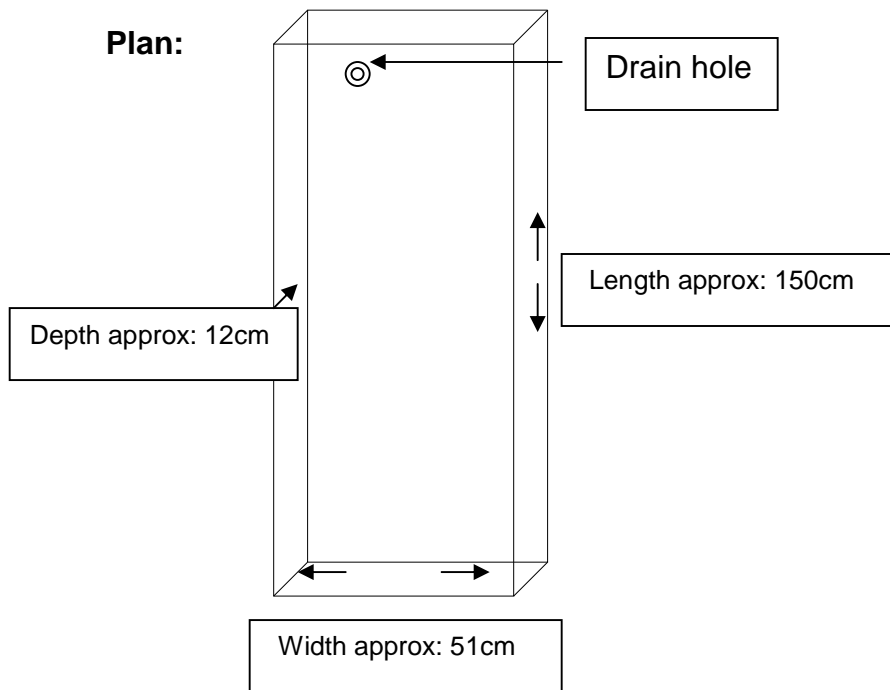


Make a Flume

A simple flume is basically an open box that is waterproof, and allows water to flow through at an adjustable angle. It is important to be able to control the water level for certain experiments.

Plan:



Step 1

Get the wood pre-cut unless you've got access to a good

Resources (all prices are guesstimated)

- 1X 8 by 4 foot sheet of 18mm marine ply. This is waterproof and hardwearing but expensive. £54.00
- Quality wood glue e.g. "lumberjack" £6.50
- 18 x No. 8 brass wood screws 4mm x 40mm
- Tube of Unibond silicon paintable sealant £3.75
- Can of 3 in 1 Weathershield undercoat £7.50
- Home Base 40mm bath waste and combined overflow pipe £8.95
- 15mm copper pipe £2.95
- 1 x 15 – 22mm reducing copper pipe connector £2.95
- 1 x 15mm 90 degree bend copper pipe £2.95
- Varnish £3.95
- Homebrew barrel £12.95

Total = £120.00ish

Tools:

Bench saw (*unless you get the wood pre-cut which is highly recommended*)

Jig saw

Hack saw

Drill with round saw bits (14mm and 38mm)

Screwdriver

Clamps

Sealant gun





Step 2

Assemble the sides and base as shown.

Drill and screw sides together

Step 3

Then screw base onto sides. When satisfied that the parts fit snugly, unscrew the sides and add wood glue. Replace the screws and wait for 48 hours before removing excess glue with a sharp chisel.



Step 4

Drill a hole to fit the waste drain. I used a 38mm cutting drill and enlarged the hole gradually with sandpaper. I then tapped the drain plug into place and fixed it in with silicone sealant. Attach the flexible tube that comes with the drain to the outside of the flume with a pipe clip. This allows you to control water levels.

The Home Base drain is made of a brittle plastic. Fortunately you get two in the pack after you've smashed the first one trying to get it in.



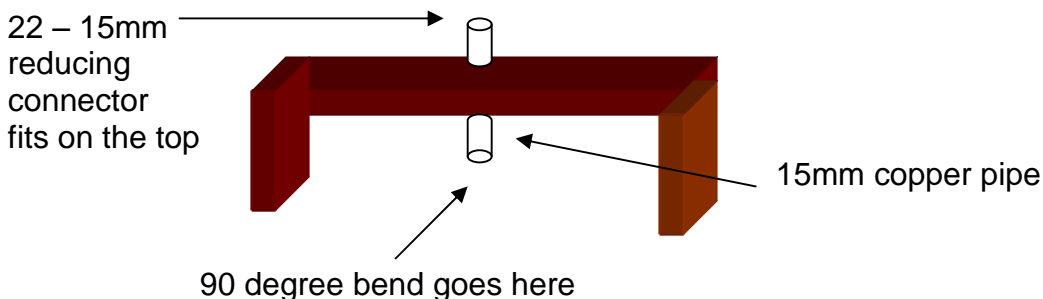
Close up of the drain plug hose and retaining clip. This is the sea-level position. For a river channel you would probably have the flume free-draining.

Step 5

Sand down edges of flume and add a layer of silicone sealant (paintable) to the seams. Allow to dry (48 hours) Although marine ply should last for 10 years without being damaged by water it makes sense to paint the inside, apart from anything else it makes a good contrast when taking pictures of processes. In used three layers of exterior undercoat and didn't bother to add a topcoat. For extra hardwearing properties, and to ensure it's waterproof, (especially if the construction is a bit dodgy), you could paint the inside of the flume with epoxy resin. However the whole contraption is already **VERY HEAVY!**

Step 6

In order to get water into the flume it would be good to consider that the water coming out of a tap varies in pressure. My solution looked like this:



This attachment is designed to straddle the flume. Water is delivered through the copper pipe which has the plumbing attachments labelled. The attachment could incorporate legs with which to raise the whole flume but no doubt that would infringe the design by the "MAJOR EDUCATIONAL SUPPLIER"

I then glued some small bits to ply to the top in order to retain the homebrew barrel. Mains water goes into the barrel which then acts as a simple constant head tank and the tap of the barrel sits over the top of the copper pipe to allow water flow to be adjusted simply.



Close up of the water inlet system. Mains water goes via a hose into the top of the barrel which is not connected to the flume. This gives a simple but effective control over water flow.



Step 7

Buy some children's play sand for a test bed and wash out the cleaning agent that makes it foamy! (Builders sand will stain)

Set up the flume with the drain over a sink (or a dustbin)

Use blocks of wood to adjust the slope angle. My flume would be improved with a better system for adjusting the angle.

You may want to get a rolling pin for smoothing the test bed and my top tip is to go to Toys R Us and buy a set of plastic trees and farm animals for making experiments more realistic.

I also use plastic straws, wooden lolly sticks and some pebbles from Chesil Beach (collected at risk of a £20.000 fine!) for different experiments. A sliced up length of 25mm plastic pipe makes a good delta flume (or private schools might like to buy a Perspex one from a MAJOR EDUCATIONAL SUPPLIER for an unbelievable £75.00!!)



Then get modelling! I've used my flume for modelling glacial processes, soil erosion, liquefaction, river erosion, meander studies, deltas, longshore drift, rotational slumping and sand dune formation. Why not send me ideas for projects, and I'll add them to the lessons section (with appropriate acknowledgements)

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