HOW TO: MAKE A BUG AQUARIUM

SIMPLE PROJECTS FOR CONSERVATION

Anyone familiar with the League's Save Our Streams program knows that bugs are a key indicator of a stream's water quality. Teaching people about stream health means showing them how to identify macroinvertebrates. So, whether you're setting up an educational booth or talking to a group of first-time stream monitors, it helps to have a working aquarium that can showcase living critters such as mayfly and caddisfly nymphs. The tank needs to have a flowing current to simulate a stream's oxygen-rich environment. The aquarium featured here does just that. It was designed by stream ecologist David Kirschtel of the National Ecological Observatory Network.

If you are using the tank as a teaching tool, make use of the League's book, *A Guide to Aquatic Insects and Crustaceans*, with its detailed macroinvertebrate illustrations and descriptions. Other League resources can help you in your biological monitoring, too. For more information, visit www.iwla.org.

Materials

- Clear acrylic ice bucket, approximately 9" to 13" in diameter (we got ours at Target)
- Plastic 2-liter soda bottle, emptied and cleaned
- Rocks (palm-sized work best)

From pet supply store:

- Aquarium air pump (for 20-40 gallon tank)
- Aquarium rigid tubing, 3/16" diameter (comes in 36" length; you need a 2" to 3" section)
- Aquarium airline tubing, standard size, 36" length or more
- 2 or more 1" suction cups
- Silicone sealant

From home improvement store:

- Clear vinyl hose, 1" diameter, about 6" to 8" length
- 8 or more plastic cable ties, 8" length
- X-Acto knife

ILLUSTRATIONS BY **MARIA RABINKY**

1. Create air pumping system

Use the X-Acto knife to cut the vinyl hose to appropriate length. It should be long enough to position onto the side of the bucket, at a 45-degree angle, with the bottom pointed about 1" from the bottom of the bucket and the top about 3" from the rim.

Take the 2" to 3" length of rigid tubing, find a point about 1/3 from one end, and warm it over a candle for a couple of seconds to bend it 90 degrees into an L-shaped tube.

Use the X-Acto knife to cut a small hole in the vinyl hose at the bottom end. Insert the short, bent end of the rigid tube into the hole, creating an inflow side of an airlift tube. Secure the longer end of the rigid tube to the vinyl hose with cable ties.

Cut a slit in the top nub of each suction cup to thread cable ties through. Attach suction cups to the vinyl hose by cinching the ties around the tube.

Connect one end of airline tubing to the rigid tube, the other end to the aquarium pump.

2. Prepare soda bottle

Cut the top off of the soda bottle. Cut a few holes out from the bottom and top of the soda bottle. This will aid the circulation of the water in the tank.

Run sealant around the open edge of the soda bottle. Glue the bottle down to the center of the bottom of the bucket. The bottle will channel the water flow around the tank.

3. Set up tank

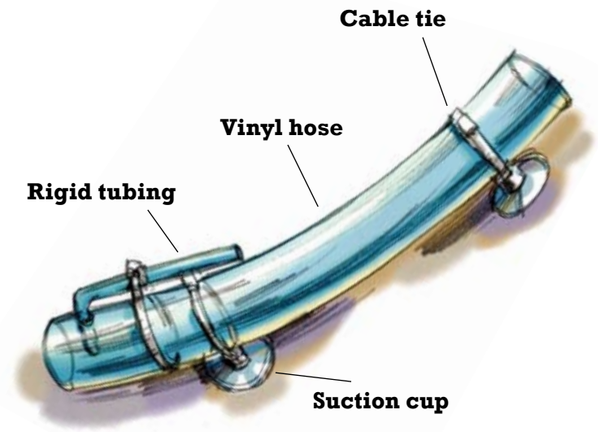
Add a layer of rocks around the bottom to create spaces for the macroinvertebrates to hide.

Attach suction cups to position the vinyl hose onto side of tank; the bottom of hose should be just above the pebbles, the top should be at the planned water line.

Fill the tank with water from a pond or stream. The water should be slightly above the top of the airlift hose.

Turn on the air pump. Check that the current flows evenly around the tank.

If the tank won't be in a sunny location, consider placing a halogen lamp over it for light.



4. Add bugs

Collect whatever aquatic insects you can find locally. Select a mix of bugs that represent clean and polluted waters. Keep them in the water you collected them in before depositing them in the tank. Be aware that certain species such as dragonflies and some stoneflies are predaceous and will eat their tankmates.

If you use the bug aquarium as an educational tool at a booth or event, people can either look through the clear tank to locate bugs beneath rocks, or you can provide nets and containers to take bugs out for closer inspection.