

ADOPT-A-STREAM MONITORING EQUIPMENT BUILDING INSTRUCTIONS

BIOLOGICAL SAMPLING: ARTIFICIAL SUBSTRATES

THE HESTER-DENDY SAMPLER

Used to grow and then collect representative communities of macroinvertebrate life on the bottoms of streams, rivers, and lakes. Macroinvertebrates attach themselves and colonize this device. It is designed so that its usable surfaces total one square foot.

Materials:

| | | |
|---|----------------------|-----------------|
| | Hard board | 9" x 12" x 1/4" |
| | Hard board | 10" x 1" x 3/8" |
| 1 | Eye bolt | 3/8" x 6" |
| 2 | Washers for eye bolt | |
| 1 | Wing nut for eyebolt | |

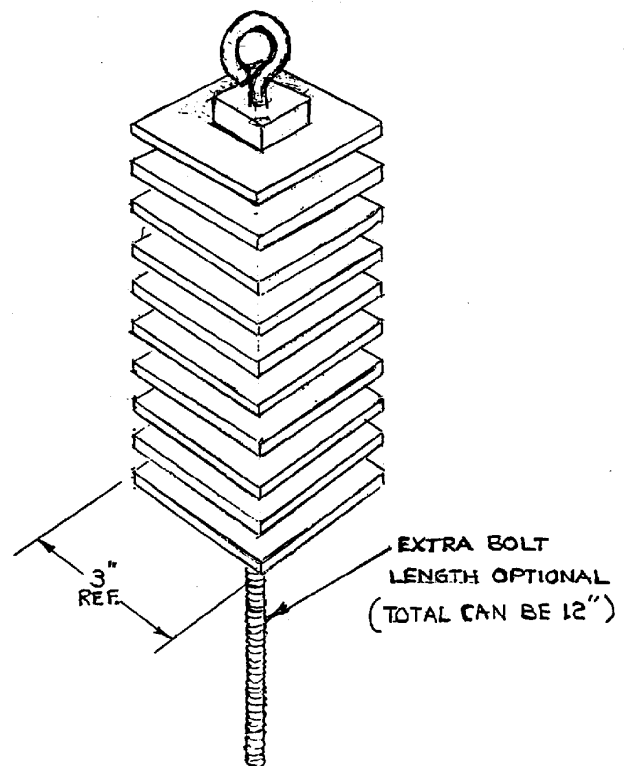
Tools:

Small hand saw
Drill and 3/8" bit
Sandpaper
Hacksaw

Building Instructions:

1. Cut the 1/4" hardboard into ten 3" squares. Cut the 3/8" hardboard into ten 1" squares. Drill 3/8" holes in the center of all the squares.
2. Assemble the sampler by sliding one of the 1" squares onto the eyebolt and then adding one of the 3" squares. Continue sliding squares onto the eyebolt until you have added eight more of the 1" squares, alternating with eight of the 3" squares. Place the tenth 3" square on the bolt right after the ninth 3" square, making a very narrow crack into which some types of microscopic organisms can crawl.
3. Set the tenth 1" square on the bolt, add a washer, and tighten the plates together with a wing nut.

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To Use:

Artificial substrates are used in studying benthic organisms in deep or high velocity water. In six to eight weeks a population that is hopefully representative of the habitat becomes established, and can be taken to the laboratory for evaluation when the substrate is retrieved. The samplers may be placed on the bottom if it is composed of sand, gravel, or rock. If the bottom is made of mud, suspend the sampler just off the bottom so that it does not become covered with silt. Tie the sampler to an overhanging branch or an object on the bank. In very swift water or in locations where attachment is difficult, the sampler may be attached to a metal rod that has been driven into the bottom of the lake or stream.

Retrieving artificial substrate samplers

1. Carefully place a net around the sampler to help prevent mobile invertebrates from escaping. Immediately place each sampler in a labeled plastic bag with some surface water to keep the organisms from drying out. This should be kept cool on ice if more than an hour elapses before identification of the organisms.
2. Open the plastic bag over a white enamel tray and remove the water and the sampler.
3. Disassemble the sampler and shake or brush (with a soft toothbrush) any macroinvertebrates that are still attached. Since the surface area available for colonization in the Hester-Dendy sampler is known, the results can be used to compute biomass as well as species composition and diversity.

For information on analytical methods, refer to the Adopt-A-Stream High School Teacher's Guide, Activity 7.4.