

# ADOPT-A-STREAM MONITORING EQUIPMENT BUILDING INSTRUCTIONS

## BIOLOGICAL PARAMETER: PLANKTON SAMPLING

### THE PLANKTON NET

Used to filter the larger plankton out of the water. It can either be towed through the water or held in the current of a stream. The plankton caught are washed into a collecting vial at the end of the net by rinsing the outside of the net. For quantitative studies the amount of water that passes through is calculated. Complete instructions are given in the High School Manual, Activity 7.1, Plankton Diversity and Water Quality.

Plankton nets isolate only a percentage of the plankton present because many (especially phytoplankton) are too small to be caught in a net. Nets have different mesh sizes, depending on what types you would like to collect:

- ❑ *"Standard" plankton net (#0)* uses synthetic cloth with 34 meshes per inch and is suitable for larger zooplankton;
- ❑ *"Fine" net (# 12)* uses cloth with 125 meshes per inch (0.119 mm openings) and is better for small zooplankton, will catch some phytoplankton.
- ❑ *Net size #20 (0.076 mm openings) and #25* are best for phytoplankton (though more likely to clog).

#### **Materials:**

1 pc	1/4" copper tubing	1/4" x 27 1/4"
1 pc.	Fine netting or light cloth*	28" x 18"
3	Grommets	
1 pc.	Nylon cord	1/8" x 36"
1	Very small funnel	
1 pc.	Thin rubber tubing	3" long
1	Small wooden plug	
1	Large fishing swivel	
1	Small stoppered vial or baby food jar	
1 pc.	Tent poplin or canvas	28" x 6'

#### **Tools:**

Sturdy vice  
Hacksaw  
Grommet tool  
First grade flat file  
Epoxy or plastic cement  
Yard stick  
Hammer  
Sewing machine  
Large fabric scissors  
Pins  
Nylon Thread

#### **Procedure:**

1. Bend the 27 1/4" length of tubing into a circle. This is the hoop of the net.
2. Make the hoop cover by folding the piece of poplin in half, width-wise, and sew a double seam 1" from the fold.
3. Cut the netting to make a cone about 18" deep. Sew this between the layers of the cover.
4. Join the two edges of the cone. Starting at the tip of the net, sew up the net about half way.
5. Slide the hoop cover and the net around onto the hoop.

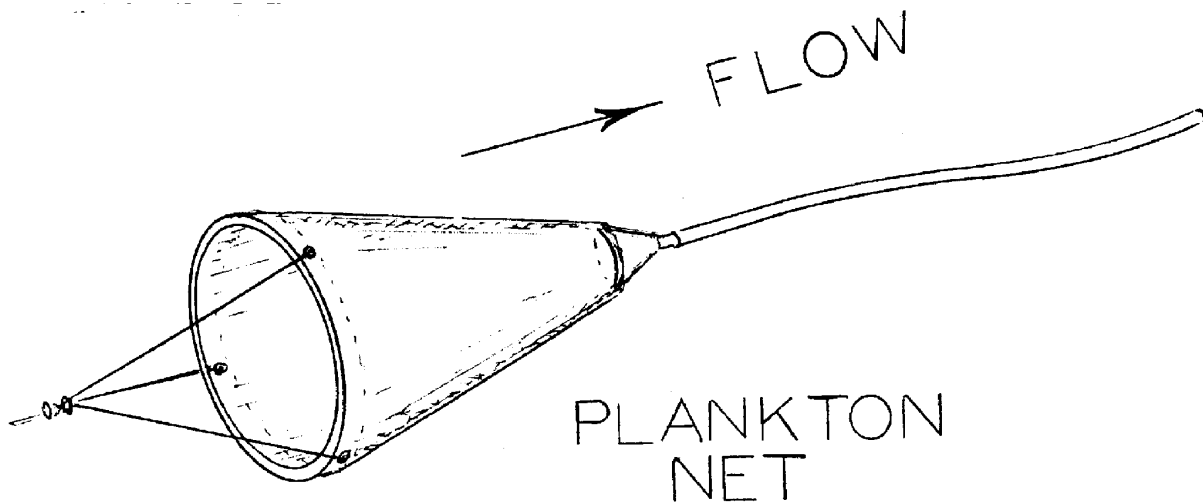
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### THE PLANKTON NET (continued from page 1)

6. Solder the ends of the hoop together.
7. Sew the rest of the seam, including the ends of the hoop cover.
8. At the tip of the net, cut an opening slightly smaller than the mouth of the funnel.
9. Epoxy the funnel into this opening, pointing it out (away) from the hoop.
10. The piece of tubing should be thin-walled and flexible. Stretch it over the end of the funnel, and if necessary, fasten it by twisting a short piece of wire around it.
11. Seal off the tube by putting the small plug in the trailing end.
12. Fasten the three grommets in the cover just behind the hoop equally spaced around it.
13. Cut the cord into 1' lengths, and tie one length in each grommet. Join all three together at their other ends, and fasten them to the swivel.
14. The towline will be fastened to this swivel.



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#### **PLANKTON SAMPLING**

Before sampling for plankton, consider some factors that can affect their *distribution*:

1. Since plankton move with water currents, an idea how currents move in your body of water is important. It is usually best to tow the plankton net at right angles to the direction of wind or current.
2. Sunlight influences both the movements of plankton and primary production. Daily vertical migrations are common. Zooplankton tend to collect near the bottom in daylight and to distribute more evenly at night.
3. Nutrients, particularly nitrogen and phosphorus stimulate algae growth. Lack of a nutrient can limit production.
4. Toxic compounds can either kill plankton or alter their life cycles.
5. Warmer temperatures stimulate growth, up to tolerance limits.
6. Plankton in small streams may actually be periphyton scoured from the streambed.

The waters of streams and rivers are generally well mixed, and subsurface sampling is sufficient. Sample in the main channel and avoid backwater areas.

Subsurface sampling is also fine for shallow lakes, ponds or reservoirs 2 to 3 meters in depth. If you are sampling a deeper lake you will need specialized equipment to take samples at regular intervals with depth (Kemmerer or Van Dorn samplers).

Samples obtained with nets are not quantitative unless you have a metered net or use one of the following procedures (semi-quantitative):

1. Tow the net through the water with a line, noting how far the net was pulled. The amount of water that has flowed through is calculated by multiplying this distance by the area of the mouth of the net.
2. Organisms must be washed out of the net in a quantitative fashion by rinsing the net thoroughly into the funnel end using tap water brought for this purpose. (If you use lake or stream water, your sample volume increases by an unknown amount).