Tri-Valley Fly Fishers
"Trout In Classroom" Program

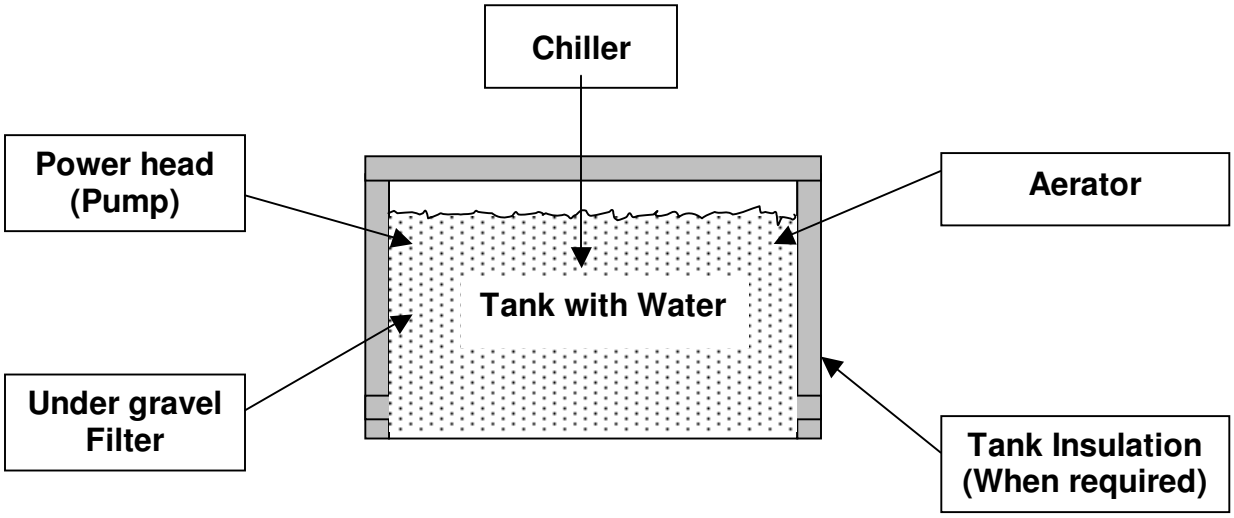
Basic Trout-in-the-Classroom Aquarium System Design

AQUARIUM SYSTEM DESCRIPTION:

Classroom aquariums used in the Bay Area TIC Program may vary somewhat in configuration details; however, the basic design is similar. They are designed to simulate a natural stream. The most significant conditions we attempt to simulate are:

- ☺ Cool Clean Water
- ☺ Stream Type Current
- ☺ Natural Streambed Gravel Bottom
- ☺ Healthy Dissolved Oxygen Content in the Water

A simplified schematic diagram of the classroom TIC aquarium is shown below



Basic TIC Aquarium System Components

SYSTEM COMPONENT OVERVIEW:

Tank with water: Glass tanks of varying size are used. The eggs need clean spring water (bottled drinking water) that is free of contaminants. It should not be city tap water that may contain traces of contaminants (chlorine, fluoride, etc) used in the purification process. Distilled water should be avoided because it lacks important minerals and nutrients.

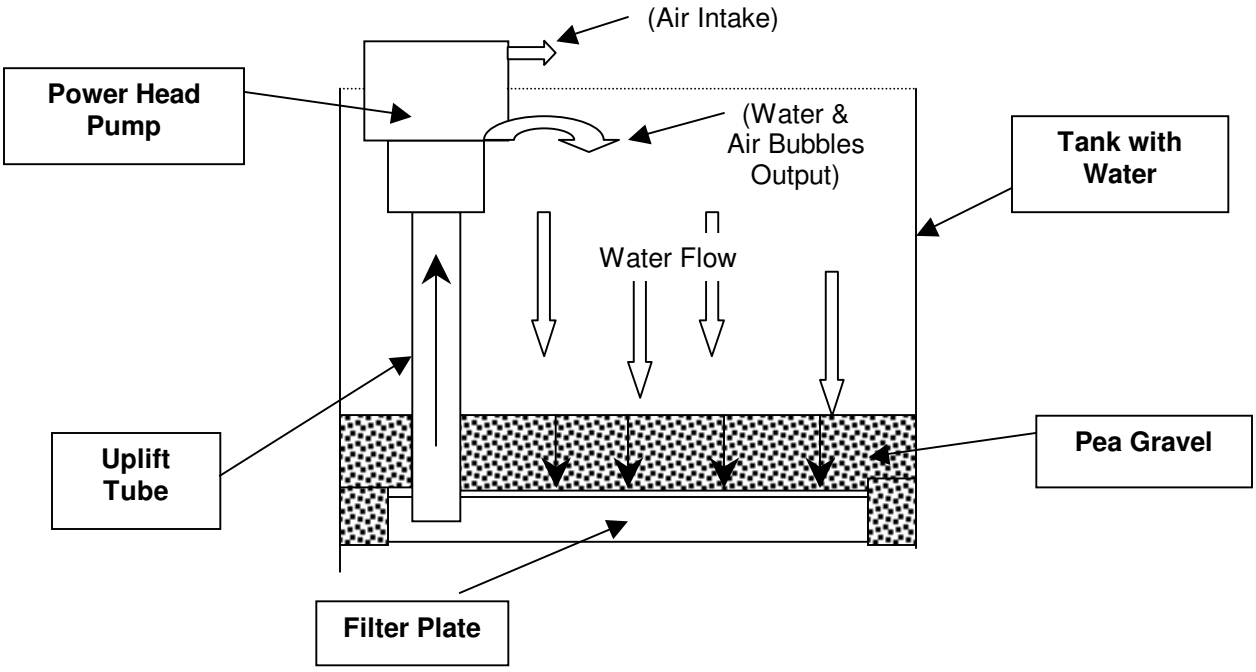
Chillers: Chillers keep the water temperature at a level healthy for the trout. The chillers used in the TIC program vary considerably. Some are small and require insulation be added to the tanks to maintain proper temperature. Larger units easily maintain the tank's temperature at a required level without added insulation. However, they are much more costly.

Insulation/Covers: Tanks using the affordable chillers require insulation. This is typically custom-made Styrofoam box with a front and top that provides access to the tank. If the larger chillers are used insulation is not required, however, a light blocking cover is needed for the early stages of the fish's development.

Under Gravel Filter: These filters are assembled in all of the tanks, with the only difference being size. The filter should cover the entire bottom of the aquarium. It consists of a bottom plate with an open space beneath it and a thick layer of small gravel covering the top of it. It has a tube extending up from the space under the filter plate to a pump. The aquarium water is circulated through the tank, forced down through the layer of gravel, through the space under the plate, and up the tube to the pump (see "Under Gravel Filter Operation" diagram, page 3). This creates a biological filter that removes bacteria and/or contaminants from the water.

Power Head Pump: This is a pump that is attached to the tube that extends up from under the under gravel filter plate (see above). It draws the water from under the filter plate and pumps it out into the aquarium, creating a current in the tank and forcing the water down through the gravel. The current is critical for the survival of the trout eggs and simulates natural stream conditions. Size is the only difference in the pumps in various tanks. Larger tanks need larger pumps.

Aerator: In most aquariums, the "Power Head Pump" also induces air into the stream of water that circulates throughout the tank. This raises the dissolved oxygen level in the water, which is necessary for the eggs and the fish to survive. In a few systems, this feature of the pump is not available, so an external aerator pump is used to oxygenate the water



Under Gravel Filter Operation

SUMMARY:

The design of the aquarium assembly simulates natural stream like conditions for the trout eggs and young fish. The Power Head Pump and Under Gravel Filter provide a natural stream condition, complete with clean water, a current flow, and a natural streambed type bottom. The chillers keep the water cool enough for the health of the fish, and the aerator maintains a natural dissolved oxygen level in the water. It is important that all these conditions be met for the aquarium to be able to keep the fish alive and healthy.

It is anticipated that the teacher will include these details in their classroom curriculum, so the students will understand the importance of satisfactory stream characteristics, and how they are related to the survival of the fish.