

## Welcome to Salmonids in the Classroom

Fisheries and Oceans Canada is pleased to support salmon incubation in your school. Raising salmon in the classroom is an opportunity to teach students to understand, respect and protect freshwater, estuarine and marine ecosystems, and to recognize how all humans are linked to these complex environments.

## The Aquarium Environment

As much as possible we want the tank to represent a stream environment. The equipment is designed to create the habitat that salmon need. When students are aware of these needs, maintaining the tank becomes more meaningful.

### Learning Resources

Salmonids in the Classroom resources (Primary and Intermediate) are required for the program.

Download at [www.streamtosea.ca](http://www.streamtosea.ca)

#### SALMON HABITAT

#### AQUARIUM PROVIDES

- 1 Cold water between 5°C to 10°C . . . . . refrigerator and insulation
- 2 Oxygenated water . . . . . fluval filter which aerates
- 3 Clean water . . . . . filter inserts which clean
- 4 De-chlorinated water . . . . . aquaplus chlorine remover
- 5 Darkness for eggs and alevins . . . . . covering of insulation and lid



### Equipment List

#### Set-up provided by DFO

- Aquarium 20 gallon
- Insulation and cover
- Fluval with filter inserts
- Aquarium gravel
- Gravel cleaner
- Thermometer
- Dip Net
- Aquaplug chlorine remover
- Cycle nitrifiers
- Ammonia remover

#### Provided by your School

- Refrigerator
- pH and Ammonia test kits
- Pie Plate and Redd
- 5 gallon bucket for water changes and fry release

#### Consumables replaced annually by your school

- Filter inserts
- Aquarium gravel
- Chlorine remover

### Calendar/Time Line

September . . . . . Applications sent to new participants as requested.  
Oct-Nov . . . . . Eggs from spawners are fertilized and reared at hatchery.  
November. . . . . Training workshops for salmon educators.  
December. . . . . Set-up tanks, prepare for egg delivery.  
January. . . . . Eyed-egg delivery to most classrooms.  
February. . . . . Eggs hatch to alevin stage.  
March. . . . . Swim-up fry stage; feeding and cleaning  
March-April. . . . . Fry released to local streams.

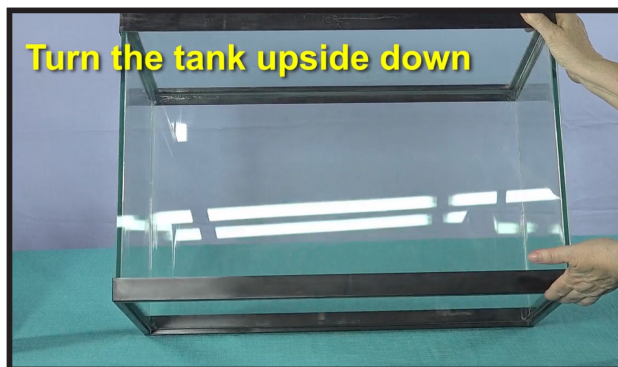
# Aquarium Set-Up

Set-up aquarium 10 days before eggs arrive to condition the water and ensure all equipment is working. Clean with vinegar/water before set-up.

## 1 Add Streambed Image

### You will need:

- streambed image
- glass dish
- scissors and tape
- mineral oil
- ruler or squeegee

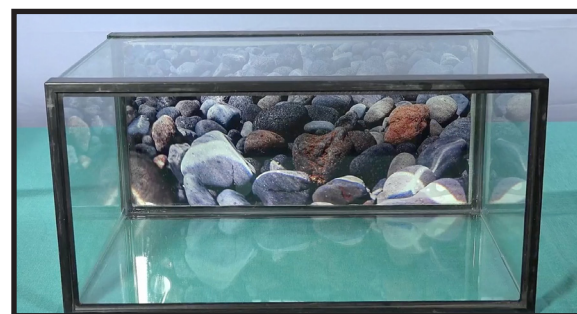
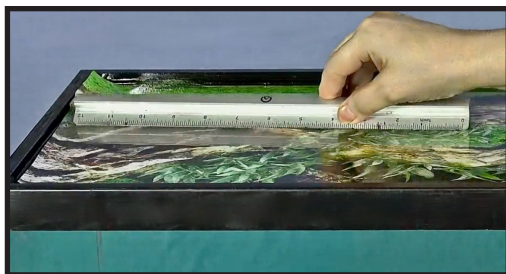


1. Cut the vinyl streambed image to fit **inside the rim** of the bottom of the tank.



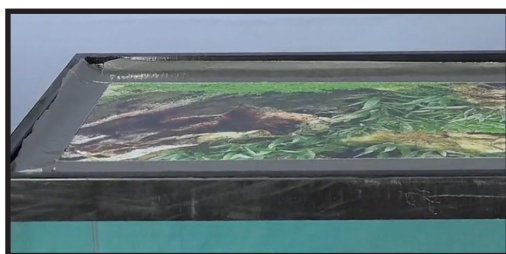
2. Add 1/4 cup of oil to bottom of tank and spread evenly. Use only **mineral or baby oil** as vegetable oils become rancid.

3. Place image of streambed face down on outside bottom of tank. **Remove air** bubbles with ruler or squeegee.



5. Streambed image on outside bottom of tank.

4. Wipe off excess oil and **tape** edges down. Image can remain on tank for several years without needing replacement.



## 2 Build Redd in Glass Dish

Use a 9 inch glass dish with high sides. Clean with boiling water or one part water to one part vinegar. Rinse well.

**Add no more than 1 cup of aquarium gravel in a thin layer.**

Use epoxy coated gravel and replace each year. If reusing epoxyed gravel it cannot be boiled or baked, only rinsed with vinegar.

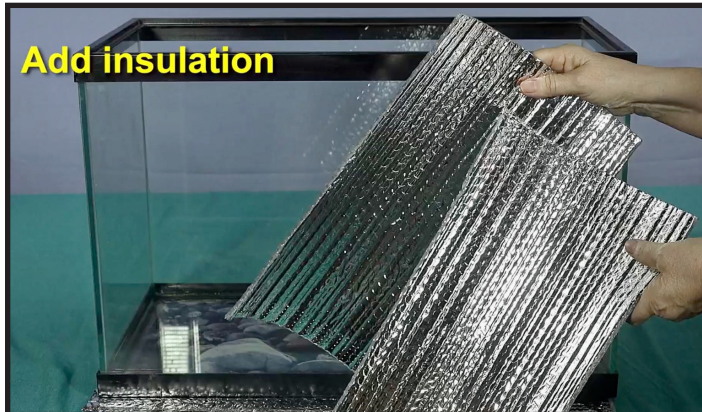


For the redd, collect 5 or 6 round rocks of 2 inch diameter. Avoid sharp edges, rust, iron, or metal in the rocks. Boil for 10 minutes and cool before adding to glass dish.



### 3 Backdrop

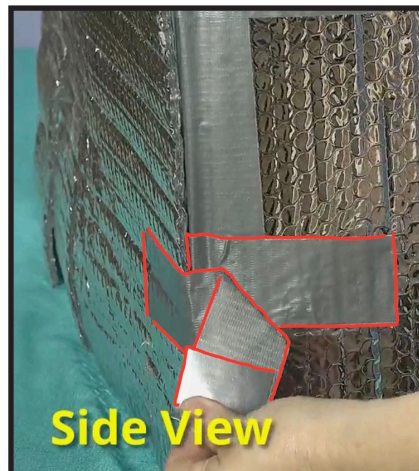
Add a laminated backdrop on the outside of the tank *between the* insulation and glass to minimize glare from the foil insulation. Have students create a stream scene backdrop or purchase from an aquarium shop.



### 4 Wrap Insulation

Add foil insulation (before water is added) and wrap tightly on all sides of the dry tank, then tape to sides. Use one piece for each side and one under the bottom. The sides, back and lid remain on the tank throughout the program. The front is removed at fry stage.

Hinge the front cover to easily open to view eggs and alevins. At this stage limit the light to three 10 minute sessions. At the fry stage remove front cover so fry become accustomed to day and night.

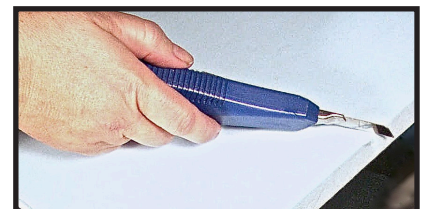


Cut a small door flap on the front cover for more frequent viewing by students.



### 5 Styrofoam Lid

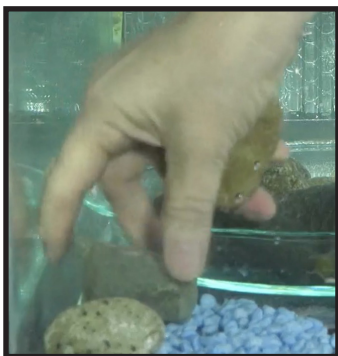
Add a styrofoam lid. For a tight fit, custom cut the lid with openings for electric cords and the refrigerator coil. This will prevent fry from escaping through spaces between the lid and sides.





## 6 Fill Tank

Run cold tap **30 minutes** prior to filling tank to clear pipes of harmful metals such as copper and lead. This is a 20 gallon aquarium.



## 11 If Alevin Escape

Some alevin may leave the glass dish. The flat surface of the tank is uncomfortable for alevin. **If this happens** build a small redd with a little gravel and 2 - 3 rocks in a corner. They will find their way to the redd.

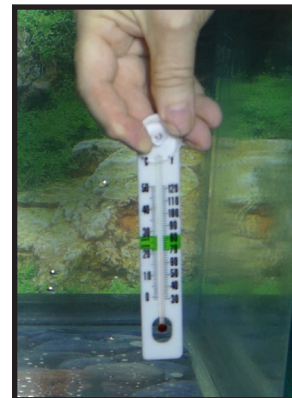


## 7 Remove Chlorine

Add AquaPlus to remove chlorine and prepare water. Follow the directions on bottle; for 20 gallons use 10 ml.

## 8 Thermometer

Add for daily recording of water temperature.



## 9 Glass Dish with Gravel and Redd

After filling tank with water carefully lower glass dish with gravel and redd into tank.

When delivered, the eggs are added to the front of the pie plate.

In two months, at the fry stage - remove glass dish, gravel and redd.



## 10 Final Aquarium Set Up





# Fluval Filter

## Airline

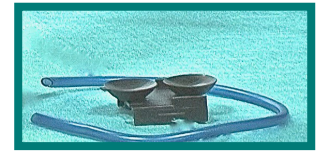
Attach securely to blue outlet. The other end of the airline (intake) should be outside the aquarium.

## Air outflow

Direct this current towards the refrigerator cooling tubes to prevent ice forming on the metal.

## Water flow

Blue lever adjusts the level of air flow; push to the + sign on right for maximum flow.



## Attachments

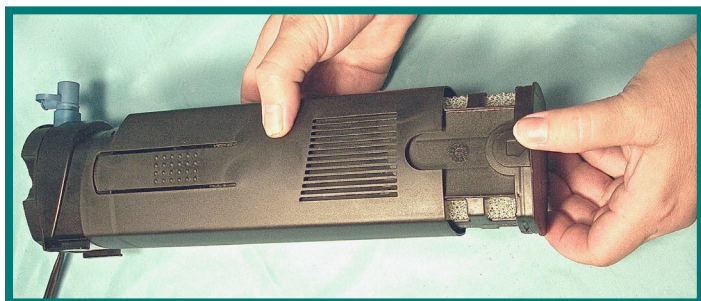
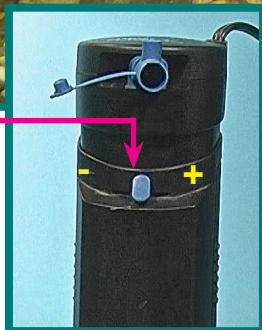
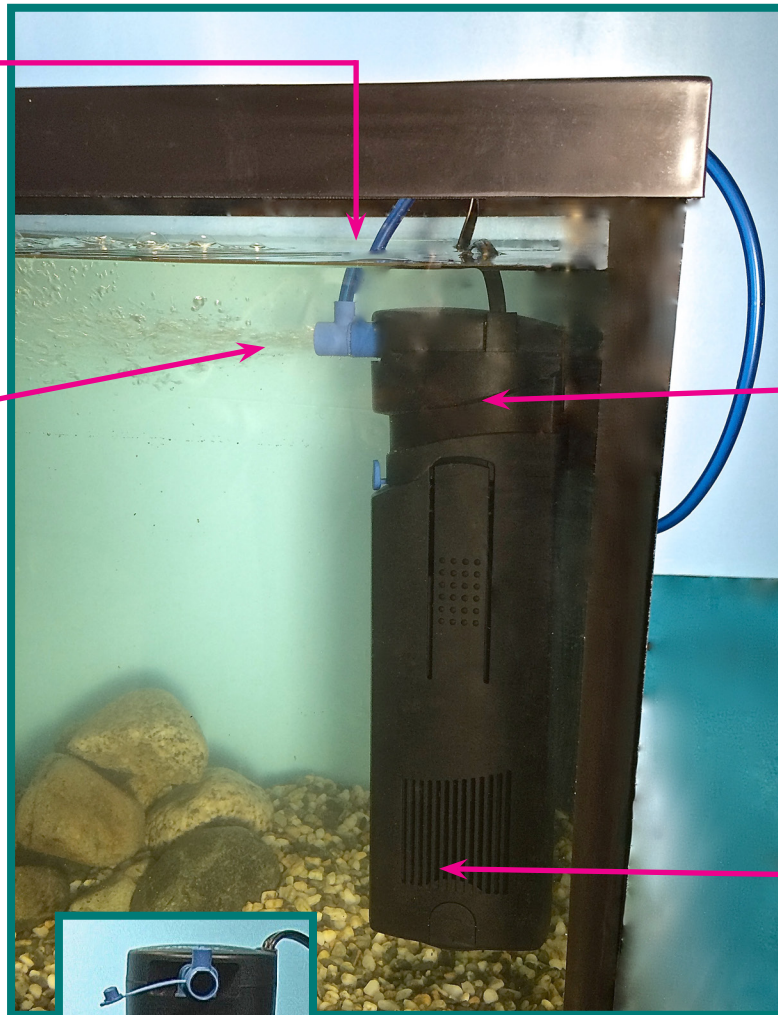
Bracket: attach Fluval to tank with suction cups.  
Airline: attach to blue outlet.

## Filter motor

(At top of Fluval) Operate only when under the surface as it is cooled by the surrounding water.

At year-end remove the motor from the top and pull out the impellor blade from inside. Clean blades and inside with a cotton swab and water.

## Water intake



## Filters

Pull the bottom of the Fluval out to remove the filter casing from inside. Rinse new foam pads and charcoal inserts before using.



## Maintenance

Rinse filters after eggs hatch. Rinse after each water change when feeding fry. Rinse in *de-chlorinated water*. Never use tap water or soap as this kills the beneficial bacteria that live in the filters. Replace filters annually (available at DFO workshops).

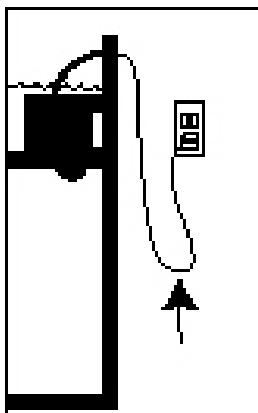
## Fluval operating precautions

To guard against injury basic safety precautions should be observed, including the following:

### READ AND FOLLOW ALL SAFETY INSTRUCTIONS

**DANGER** – To avoid possible electric shock special care should be taken since water is employed in the use of aquarium equipment. For each of the following situations do not attempt repairs yourself; return the product to an authorised service facility for service or discard the filter.

- A If the appliance falls into the water **DO NOT** reach for it! First, unplug it and then retrieve it. If electrical components of the filter get wet unplug the appliance immediately
- B If the appliance shows any signs of abnormal water leakage immediately unplug it from the power source (immersible equipment only).
- C Carefully examine the filter after installation. It should not be plugged in if there is water on parts not intended to be wet.
- D Do not operate any appliance if it has a damaged cord or plug, or if it is malfunctioning or is dropped or damaged in any manner.
- E To avoid the possibility of water dripping into the electrical outlet position the entire aquarium unit to one side of the electrical outlet. A “drip loop” should be arranged by the user for each cord connecting an aquarium appliance to an outlet. The “drip loop” is that part of the cord below the level of the receptacle, or the connector if an extension cord is used, to prevent water from travelling along the cord and coming into contact with the outlet. If the plug or outlet does get wet **DO NOT** unplug the cord. Disconnect the fuse or circuit breaker that supplies power to the appliance. Then unplug and examine for presence of water in the outlet.



Close supervision is necessary when any appliance is used by or near children. To avoid injury do not place the FLUVAL filter in contact with moving parts, or hot parts such as heaters, reflectors, lamp bulbs, etc.

Always unplug the FLUVAL filter from an outlet when not in use, before putting on or taking off parts, and before cleaning. Never yank the cord to pull the plug from its outlet. Grasp the plug and pull it to disconnect.

Make sure the FLUVAL filter is securely mounted on an aquarium before operating it.

If an extension cord is necessary a cord with a proper rating should be used. A cord rated for less amperes or watts than the FLUVAL rating may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.

The FLUVAL filter has a polarised plug (one blade is wider than the other). As a safety feature, this plug will fit in a polarised outlet only one way. If the plug does not fit in the outlet, reverse the plug. If it still does not fit fully in the outlet, contact a qualified electrician. Never use with an extension cord unless the plug can be fully inserted. Do not attempt to defeat this safety feature.

### CAUTION:

**Disconnect the plug of all appliances inside the aquarium before placing hands in water.**

- Place the filter inside the aquarium and ensure that it is placed below the water level.
- Attach the filter to the aquarium by using either the rim clamp or suction cup bracket.
- Rotate exhaust outlet to desired angle.
- Plug into power.

### CAUTION: The filter must not be allowed to run dry.

As with all mechanical filtration devices, the filter media must be changed to provide optimum purifying performance. Although the impeller is self-cleaning, regular cleansing of the impeller well is recommended. Soap or detergents should never be used as traces left on equipment may stress or kill fish. Rinse thoroughly in lukewarm water.

**CAUTION:** Always disconnect all internal electrical accessories before placing hands in water

