

# TROUT IN THE CLASSROOM

## Manual



2015 Edition

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## Manual

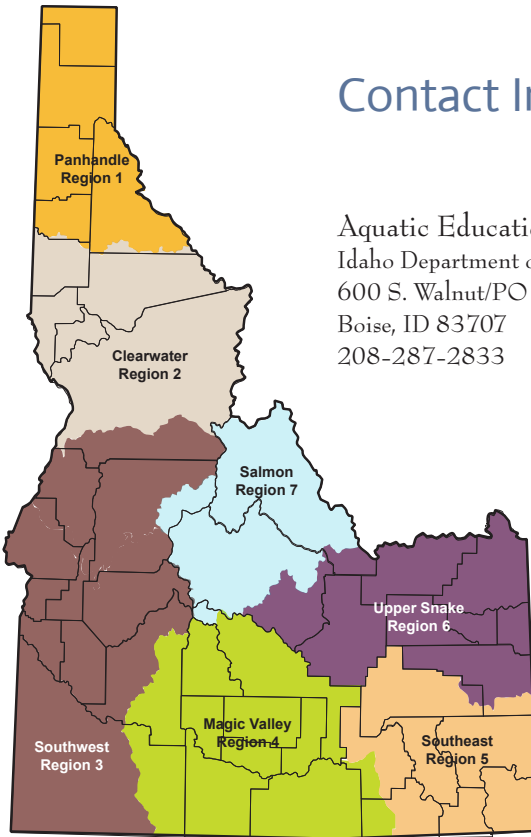
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# Welcome to Trout in the Classroom

## Purpose

The purpose of Trout in the Classroom (TIC) is to raise awareness about Idaho's aquatic resources by providing hands-on learning opportunities for Idaho students. Trout in the Classroom encourages students to actively participate in the learning process. By observing and caring for trout, students gain an understanding and appreciation of a trout's life cycle and habitat requirements.

We recommend you use this guide to assist you in purchasing the aquarium supplies and setting up your tank to prepare for your trout eggs. Trout care and how and where to release fish are also described. Trout in the Classroom is not intended to supplement hatchery production.



# Timelines

Depending on where you are in Idaho and what species you raise, the timelines will vary.

Calendar	
One month prior to egg arrival	Rinse equipment with water. Check equipment and refill.
December/January	Eggs arrive.
January/February	Eggs hatch.
February/March	Begin feeding fry when the yolk sac is completely gone.
April/May	Receive permit from your TIC Coordinator before releasing fry at approved site.
End of Year	Clean equipment with 1tsp bleach to 5 gallons water and rinse. Air dry completely before storage. Throw out old fish food.

Trout Life Cycle	
Life Cycle Stage	Duration
Eggs (eyed)	5-15 days
Alevins	2-3 days
Yolk Sac Absorbed	1-2 weeks
Fry to Fingerling*	3-4 weeks
Fingerling	4+ weeks
Release Date	Anytime in April or May
<i>*Fry = fish less than 1 inch, Fingerling = fish 1 inch or larger</i>	

# Equipment List

Appropriate aquarium equipment and supplies are necessary to provide a cold-water habitat for trout. Several types of equipment seem to work equally well, and there are multiple effective set-up options. For simplicity, we have not included all the possible equipment options. This equipment list has been successful in many classrooms in Idaho.

- Aquarium, 30-40 gallon. An aquarium "kit" can be the best value.
- Chiller, keeps the water cool at 52 degrees Fahrenheit.
- Screen lid, keeps the fish from jumping out.
- Power filter, use a hang on the back type filter.
- Aquarium stand or sturdy table or countertop. Close to a sink is helpful.
- Gravel is not necessary, but can be added to the tank.
- Water thermometer.
- Aquarium net, 4-inch minimum.
- Siphon tube, use to remove water and debris when cleaning the tank.
- Water testing kit (nitrite, nitrate, pH, ammonia)
- Dechlorinator, removes harmful chlorine from tap water.
- Vibert Box egg basket, provided by IDFG to contain and hatch your eggs.
- Five gallon buckets to add and remove water.
- Frozen two-liter pop bottles (2), keep frozen in case of power outage.



# Aquarium Set Up

We recommend testing your tank equipment a month before eggs arrive. If your chiller does not work properly, repair may take two weeks.

## Aquarium

- Locate the aquarium close to a sink, away from direct heat and light.
- Rinse the aquarium and all equipment, such as buckets and nets that will be in contact with the aquarium, with water. No soap! Hot water may be used. If needed, a 1 tsp bleach to 5 gallons of water solution can be used, but you must triple rinse. Air dry.
- Fill aquarium with water and allow the water to run through the system one day. Empty aquarium and replace with new trout safe water as final preparation for eggs.

## Filter

Power filter system or hang-on-the-back type filter is recommended.

- Prime the filter by filling with water until water flows back into the tank.
- A waterfall power filter will provide enough oxygen.

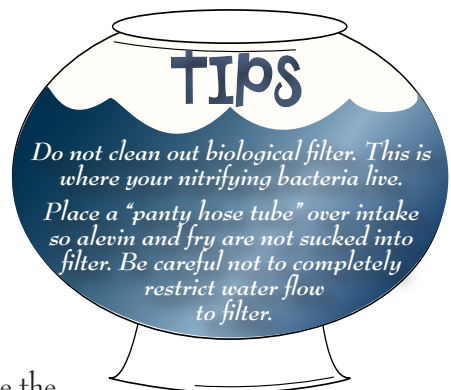
**Important!** Store filter media (i.e. biowheel) in water when not in use to keep plastic parts from drying out and breaking.

## Air Supply

- Adjust the filter water intake to ensure a good sized waterfall tumbles into tank to add oxygen into the water.
- Air stone and air pump are necessary for tanks 50 gallons and larger.

## Plugging In

- Plug all cords into the power strip while the power strip is in the off position, **except** for the chiller which must plug directly into a wall electrical socket.





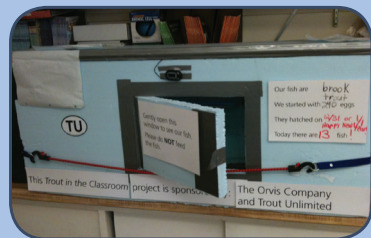
## Chiller

- Read chiller manufacturer directions.
- Place chiller beside the aquarium with the air intake grate side at least one foot from a wall.
- Place the metal coil into the tank suspended.
- Set the water temperature at 52 degrees Fahrenheit with no less than a 2 degree deviation.
- Be sure temperature sensor is under water. For Tradewind brand chillers, the sensor slides into the plastic sleeve before being placed in the water. The sensor can not directly touch the water.
- Save chiller box and warranty in case of needed repairs.

If the chiller is too noisy for your classroom, a couple options can help reduce the number of times the chiller kicks on each day.

### OPTION 1:

Put a Styrofoam box, around the aquarium. Cut out a window for viewing.



### OPTION 2:

Place a frozen 2 liter bottle of water in the tank each afternoon. Note that you must carefully monitor the water temperature. Extreme water temperature fluctuations stress fish.

# Egg Arrival

- For egg transport, place eggs in a small cooler with one small lunch sized ice block insulated from direct contact. The eggs will be around 52 degrees Fahrenheit at the hatchery. Try to maintain this temperature.
- Transport eggs to the school as soon as possible. Eggs will hold if kept at a cold temperature. Acclimate your fish eggs to your tank's water temperature for 20 minutes by floating the plastic bag in the tank.
- Gently pour eggs into the top of the Vibert Box (provided at first egg pick up) or pour eggs into tank.
- Vibert Box should be placed in the aquarium either suspended from the side of the aquarium or on the bottom. Rocks can be placed on top or inside the box to sink. When the eggs hatch, the alevin will swim out.

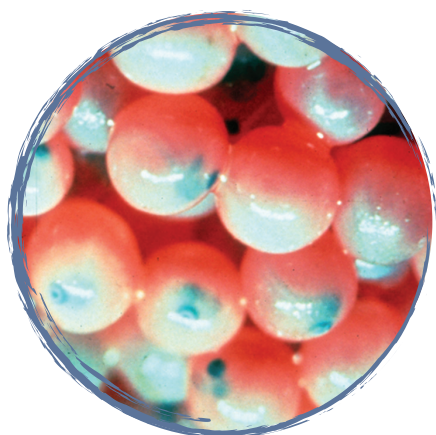


## Tip

*Putting some eggs into a shallow glass bowl or shallow jam jar can make it easy to remove eggs for viewing under a microscope.*

# Taking Care of Your Trout

## Eggs

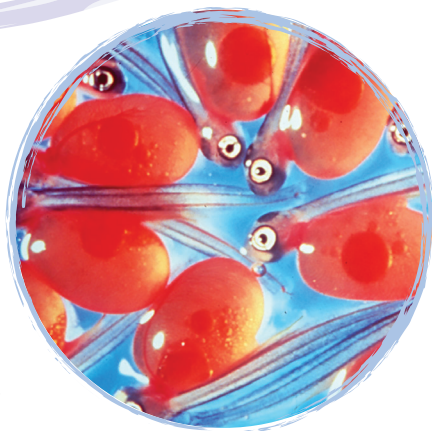


The eggs will be in the eyed egg stage when you receive them. Eggs are very vulnerable to environmental stimuli such as light and changes in temperature. Do not expose these eggs to sunlight or fluorescent light. Make sure the tank cover is on at all times to provide shade and prevent objects from polluting the water. Tank temperature should remain within 2 degrees above/below 52 degrees Fahrenheit.

Make sure you have cleaned your hands with water, so they are free of lotions or soap residue before handling the fish or putting your hands in the tank. Remove dead (white colored) eggs ONLY if you can remove them without touching or disturbing live eggs.

## Alevins

The eggs are hatching! Yay! You now have alevins! They may hide in the gravel and disappear for 1-2 weeks. Do not disturb them or move them. Alevins are very vulnerable. When the yolk sac has completely disappeared, the fish are now fry!

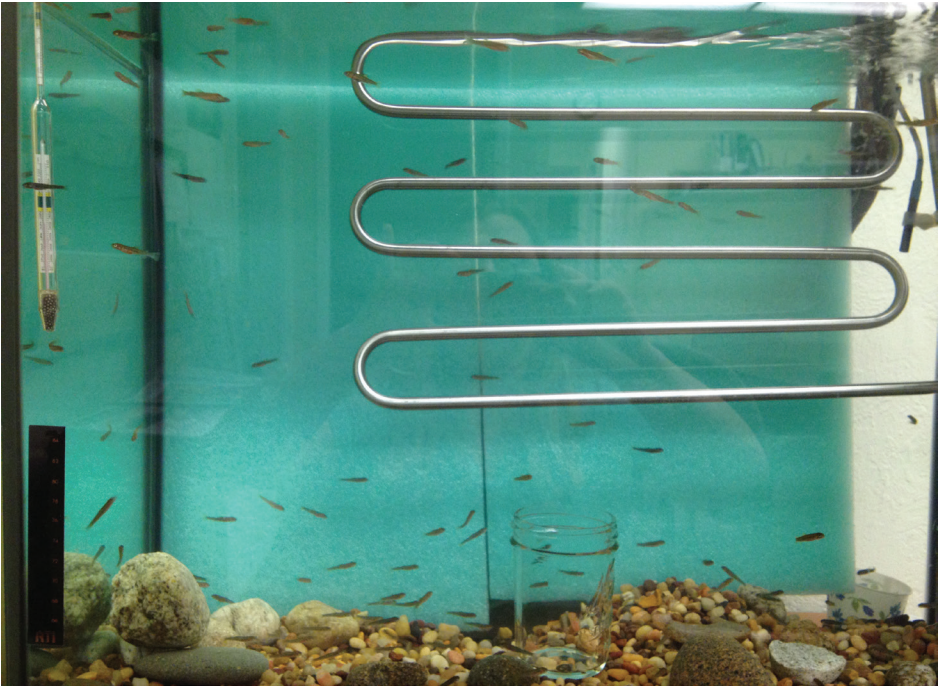


## Fry

Now is the time to begin feeding your fish. When you feed, it is very important to not feed in excess. You should only feed as much as the trout can consume in one minute. This is a tiny pinch of trout food 1-2 times a day. Don't forget to remove dead fish daily as they can spread disease and cause fungus to grow.

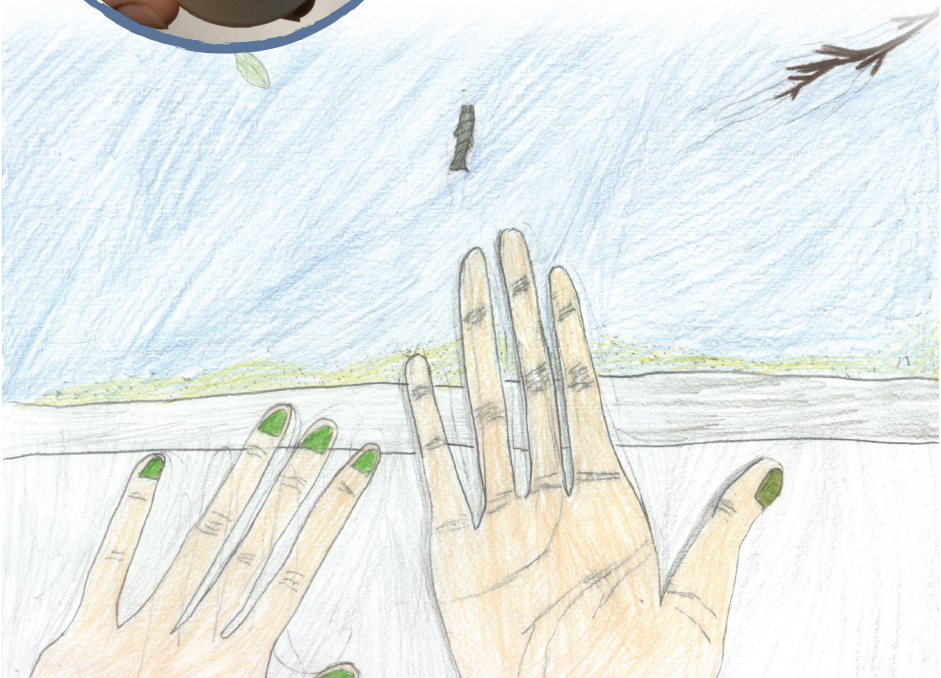
On weekends, it is okay to feed in the late afternoon on a Friday and return to your classroom Monday morning to feed again.

You should only feed as much as the trout can consume in one minute.



# Release Day

Fish cannot be placed in any Idaho waters without obtaining a release permit. Permits are provided to teachers through the Idaho Fish and Game TIC coordinator.



# Habitat Requirements

Egg and Fry Requirements	Natural Habitat	Aquarium Habitat
Limited Light (as eggs and alevins)	Eggs are buried under gravel in a redd.	Cover the aquarium to keep out the light.
Cold Water (52°F)	Snow melt, water from underground sources, and shade from stream-side plants help keep water cool.	Chiller unit cools the water.
Oxygen	Cold, rushing water gathers and holds oxygen from the air. Aquatic plants also produce oxygen.	Aeration system adds oxygen.
Clean Water	Clean water is stored and gradually released in a healthy, properly functioning watershed. Waste products are moved by flowing water and naturally degraded.	Dechlorinated water must be used. The filter and regular water changes remove waste products.
Neutral pH	Runoff from rocks, soil, parking lots, animal wastes, and decaying organic matter in the water all affect pH.	Tap water should have a neutral pH. Measure pH to maintain a balance between acidity and alkalinity.
Gravel	Rocks and gravel are washed into the stream and tumbled smooth by the water and other rocks. Spaces between the gravel are sediment free.	With an under gravel filter, gravel is needed.
Food	Aquatic insects that live in the gravel or terrestrial insects that fall into the water and tiny zoo plankton are food for fry.	A special diet of fish food.
Protection	Eggs buried in the gravel are generally safe from birds and other predators. Fry have protective coloration and hide under rocks and other stream habitat.	No predators in the aquarium.

# Aquarium Monitoring

## Weekly Checklist

- Test water
- PH 6.8-8.2 (7 optimal)
- Ammonia (near zero)
- Nitrites 0-5 (CYCLED)
- Nitrates below 5-25PPM (CYCLED)
- Dissolved oxygen 8-10PPM
- Remove 5% - 10% of the water weekly by using a siphon to clean out gravel and tank bottom. Replenish with 'trout safe' water. Do not siphon when you have eggs or alevins.

## Nitrogen cycle

- Stage 1 Ammonia spikes*
- Stage 2 Ammonia converted to Nitrite, Nitrite spikes*
- Stage 3 Nitrite to Nitrates, Nitrate spikes*





# DAILY CHECKLIST

- check water temperature (50-54°F).
- remove dead fish.
- Feed fish one pinch daily beginning in the fry stage after the yolk sac is completely absorbed. Do not feed early.

# Cleaning and Storing Equipment

- After your trout are released, thoroughly clean and properly store all equipment. Cleaning is a huge job if the tank dries and bacteria is allowed to grow. This is a science experiment you will not want.
- Empty the aquarium and remove the gravel.
- Clean the aquarium, and all equipment with warm water. If desired, disinfect with 1 tsp bleach to 5 gallons of water. Use a soft cloth and a baking soda paste for stubborn areas. Rinse thoroughly with large amounts of water to remove any bleach residue.
- Vigorously wash aquarium gravel with clean water only. Allow the gravel to air dry to prevent the growth of mold. Spread the gravel in thin layers to speed up the drying process.
- Remove dust from chiller air intake grate.
- After all equipment is thoroughly dry, reassemble and store in a clean, dry area.

**Please do not use tank for other aquatic life.**



# When Will They Hatch?

Trout and salmon eggs need 600 temperature units (TU) to hatch. A temperature unit is 1 degree Fahrenheit above 32 degrees Fahrenheit for 24 hours.

## Hatchery Data:

Temperature units of eggs day 1 in the classroom  
(provided by Fish and Game)

A

Temperature units needed to hatch  
( $600 - A = B$ )

B



## In the classroom:

Average daily temperature of classroom tank

C

Temperature units accumulated daily  
(Average temperature - 32 degrees = temperature units accumulated daily)

D

OR ( $C - 32 = D$ )



## How many days until our fish hatch?

(Temperature units needed/temperature units accumulated)

OR ( $B/D = E$ )

E

The date our fish will hatch is

Month

Day

# Troubleshooting

**M**ost aquarium systems function properly, but mechanical problems can occur. Always have (2) 2-liter frozen water bottles available in case of an emergency. Don't dump in ice unless it is dechlorinated.

## Is the water temperature increasing?

- Is chiller plugged in?
- Is there a tripped breaker? Plug in another appliance in the same outlet to see if it works. Restart chiller according to manufacturer directions.
- If you have tried the above, try reducing the temperature setting.
- If reducing the temperature setting does not work, there is a mechanical problem. Use frozen water bottles to keep the water cool and contact your Trout in the Classroom coordinator.

## If the water is freezing in the tank or around the coil.

- Make sure only the metal wand is in the water.
- Turn chiller off and then on. Restart according to manufacturer directions.

## If water movement is not apparent or bubbles are not coming from the filter.

- Adjust the filter intake and make sure water intake is not plugged.

## Egg and Fry problems

Clue	Problem	Solution
Fry gasping at the surface.	This indicates a dissolved oxygen problem but may also indicate a nitrite problem. Newly hatched button-up fry will come to the surface to gulp air and fill the swim bladder, but after that they should remain at mid-aquarium levels.	Check to make sure the waterfall is adequately coming out of the filter.
Fish gasping at the surface, listless fish, tan or brown gills.	Nitrites.	Check the nitrite level in your tank. If it is high, change half the water, reduce feedings, increase aeration, and continue to monitor nitrite levels until they reach zero. Change 5-10% of the water until acceptable water quality is reached.
Discolored eggs, eggs with eyes extending outside of the shell but the rest of alevin still inside the shell.	pH problem. pH levels are affected by the accumulation of hatching and fry waste products. As these waste products increase, the pH drops, creating more acidic water. If the pH falls below 6.5, the eggs or fry can die or be severely damaged.	Change 5-10% of the water. Use dechlorinated water that is close to the same temperature as the water in your tank.
Changes in pH measurements, compression of fins on the fry.	Ammonia levels.	Change 5-10% of the water in your tank.

Clue	Problem	Solution
White fuzzy growth on egg or fry.	Fungus.	If you are not using a Vibert Box, promptly remove all dead eggs and egg shells. If you are using a Vibert Box, do not remove dead eggs as this can cause more potential harm to the live eggs. Remove dead fry. This should prevent further spread of the fungus.
Fry that swim in circles.	Deformed or injured fry.	Check water quality. Change water. The fry cannot be healed. Continue to observe them and remove if they die.
Oily reddish spot in egg.	A ruptured yolk sac caused by excessive jostling or late shocking at the hatchery.	Observe the egg and remove if it turns white, indicating death.
Discolored yolk, fry swimming on their sides.	Coagulated yolk.	Minimize handling, turbulence created by water flow, and light exposure.
Two heads, other deformities.	Natural deformity caused by errors in development.	There is no solution. Just observe the development of your unique fish.

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