

# TIPS FOR RAISING SALMON IN YOUR CLASSROOM

*Volunteers and teachers with many years of salmon-rearing experience contributed to the following advice. Don't hesitate to seek technical assistance if it doesn't answer all your questions.*

## WHAT TO HAVE ON HAND

Use this checklist to inventory which accessories and supplies you have on hand and which you'll need to purchase from an aquarium shop in your area. You'll also need a clean bucket, a bowl for dipping water, and a fish net.

Suction-cup thermometer, F. and C.	\$ 4
Gravel vacuum	\$ 15 - \$ 20
Clean, natural gravel (50# bag)	\$ 30
De-chlorinator solution*	\$ 4 - \$ 15
Neutralizer block for chemical balance*	\$ 3
pH test kit*	\$ 7
Ammonia test*	\$ 10
Nitrite test kit*	\$ 10
Flake-style fish food**	\$ 5
Frozen bloodworms**	\$ 3

\*Good for several years

\*\*Enough for 6-8 weeks

## PREPARING YOUR SALMON TANK

- Rinse the tank in water only. If it's really dirty, scrub it with baking soda or a strong salt solution, and then rinse it thoroughly.
- Use fresh, natural gravel. Do not use colored or very old gravel. Rinse it well in cool (never hot) water to remove dust, pour it into the clean tank, and spread it gently with your hand.
- Install your aerator, filter, and refrigeration unit. If you use a sensor to maintain temperature, set it at 45° F. As a backup - and so students can check temperature easily, also install a suction-cup thermometer inside the tank.
- Fill the tank with tap water. (To avoid unwanted chemicals, do not use a garden hose or galvanized bucket.) Fill to within four or so inches of the top and use a Sharpie or tape to mark the fill line.
- Turn on the aerator, filter, and refrigeration unit four weeks before you receive eggs so that you're sure everything works. During this time, chlorine (which can damage fish gills) in the tap water will naturally neutralize.
- If ice forms on the refrigeration bar, turn up the temperature a degree or two but never higher than 50° F.
- Install a neutralizer block to help maintain chemical balance.
- Wrap netting over the filter intake or attach a foam rubber "fish sponge" to prevent alevin from being sucked in.

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## TANK CLEANING

How often your tank needs cleaning depends on the number and size of fish, their food, how well your filtration system works, and chemical balance. In a chemically balanced tank, beneficial bacteria, filtration, and gravel break down ammonia and nitrite naturally and reduce the need to clean.

If you have to clean the tank more than once a week, reduce the amount of food you are giving.

- Use a gravel vacuum to pick up uneaten food, egg casings, or other large debris and to tumble debris out of the gravel. Section your tank into fourths or thirds and clean only one section of gravel at a time, all the way to the bottom. Vacuum a different section next time.
- Algae won't harm your fish or water quality, so clean only the front of your tank for a clear view. Scrape the glass with a scraper or wipe with a clean sponge. If your tank is plastic, make sure your scraper is safe for plastic.
- Remove any dead (white or yellowish) eggs daily.
- Avoid replacing more than one third of the water at a time so that you don't stress the fish or upset the chemical balance.
- Make sure the water you add is exactly the same temperature as the water in your tank.
- Add an amount of de-chlorinator proportionate to the amount of new water.

### TECHNICAL ASSISTANCE

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# MAINTAINING CHEMICAL BALANCE IN YOUR TANK

Begin **weekly testing** of water for pH, ammonia, and nitrite before your eggs hatch. Test kits from an aquarium shop are easy to use and provide a learning experience for students.

If you find more than a trace of ammonia or nitrite, follow the advice below to restore chemical balance. In a balanced tank, **pH** will be between **7.0 and 7.4**.

Your fish will have adequate dissolved oxygen if your aerator is working properly and if you maintain the water temperature between **45° F and 50° F**.

**Ammonia** results from the decomposition of egg casings, fish waste, and uneaten food. It is very caustic and readily corrodes gill and fin tissue. The higher the pH, the more poisonous ammonia becomes. Red streaks on the fins indicate high ammonia.

- If ammonia tests high, check it the next day. If it continues high, do a partial water change and make sure the filter is working.
- If high ammonia persists, call us for advice about a product to add to your tank to complement bacterial action. If fish start dying, call right away; we may be able to shift some of your fish to another tank so that your tank can rebalance itself.

**Nitrite** results when beneficial bacteria break down feces and other sources of ammonia. Nitrite impairs breathing by inhibiting the uptake of oxygen and the release of carbon dioxide. Fish thus weakened are susceptible to infection.

- Re-establish biological filtration by following the instructions above for ammonia. Be patient; beneficial bacteria will solve an ammonia problem faster than they will solve a nitrite problem.
- If nitrite tests high, do partial water changes more frequently, even daily.
- If neither technique works, find out what is interfering with production of beneficial bacteria. The culprit could be colored gravel, volcanic rocks, toxic build-up, or inadequate cleaning after the tank was used for turtles or reptiles. If none of these factors seems to be at fault, call us.

## VOLUNTEER AT THE READY

Enlist a parent or other volunteer to lend a hand with the salmon project. You'll be VERY glad to have help setting up the tank, fetching supplies, and showing students how to do assigned tasks.

## FEEDING YOUR FISH

After your fish have "buttoned up" (absorbed their yolk sac), begin "tease feeding" so that they will learn to eat. Use the food provided by the hatchery for this feeding, then switch to foods that your fish are more likely to consume entirely.

They feed only as food falls through the water; they won't eat it once it hits the bottom. The more food waste and fish waste, the more frequently you will have to vacuum the gravel.

- Put a daily supply (about 1/4 teaspoon) in a vial or small lid. Use a Popsicle stick to sprinkle tiny amounts of this supply on the water. The first few days, your fish will mouth the food and spit it out but they should get the hang of eating within a week. Slow feeding will also insure that smaller fish get their share.
- At about 4 weeks after hatch, begin twice daily flake food such as Tetra-Min Tropical Flake, Omega One Freshwater Flake, and Sera Vipar; all about 45% protein and 6-10% fats. Because the flakes settle slowly, your fish will have a good chance to nibble all of this food.
- If filtration is working well and you have no problem with ammonia or nitrite, start feeding frozen bloodworms at about 8 weeks after hatch or when the fish are free-swimming (not resting at all on the bottom). Keep a close watch on ammonia and nitrite as bloodworms contain extra proteins. Continue feeding twice daily until release in May.
- Feed only as much as your fish will eat in one minute. If you find food on the bottom of the tank, reduce the amount you give.

## KEEPING YOUR FISH COOL

The most common problem tanks have is a malfunctioning refrigeration unit. Always check water temperature daily. If it rises above **50° F.**, your fish can die in short order. Here's what to do:

1. Make sure that the unit is on and that the temperature sensor (if you use) is in the water.
2. If so, **call us**. If one of us can't get there immediately, add ice to the tank (along with a few drops of de-chlorinator) or blocks of Blue Ice and continue monitoring the temperature.
3. If we must remove the unit, we'll install a loaner, diagnose the problem, and estimate the cost of fixing it. If the loaner happens to be in use elsewhere, we'll advise what to do.