Classroom Fish Tanks

Setting up a classroom fish tank that works.

By Karen Randall

When I first wrote about the aquarium we set up in my son's kindergarten classroom, I never thought I would be setting off an avalanche, but it seems I did. In our own small school system alone (in Holliston, Massachusetts) there should be over 30 tanks up and running by the time this article is in print, and several more ambitious projects are planned for the coming year. I have also received a huge number of requests for information from people in other parts of the country who would like to start the same type of program in their local schools. As a result of so much interest, I decided to write this article to help others get started installing aquariums in their local schools.

Because planted aquariums are my specialty, it is not surprising that I chose this type of setup as a model for the classroom tank. There are, however, a number of other reasons besides personal preference for this choice.

First, healthy planted tanks are more stable than non-planted tanks, and, believe it or not, a properly set up planted tank is actually easier to maintain in an aesthetically pleasing condition than a non-planted tank. In a non-planted tank, a power outage during a school vacation can mean that the class returns to a dead, smelly mess. Losses of power have happened to our planted tanks with absolutely no ill effects to the inhabitants because the plants are doing most of the filtering in the tanks. The fact that the power filter is off-line for a few days is of no consequence.

A planted tank looks "full" and interesting with a smaller number of fish. This helps prevent people from succumbing to the "one more won't hurt" mentality of fish stocking. The fish also behave more naturally with the shelter provided in a heavily planted tank, and are less stressed because of their smaller population. We frequently have unplanned spawnings and surviving fry in our tanks because the animals have the room to do what comes naturally!

Finally, there's more educational "bang for the buck" in a tank where both plants and animals are included. So, let's get started.

Scouting the Territory

Obviously, you've got to get someone on the school staff interested in the idea. The easiest place to start is in your own child's classroom. Few teachers will refuse the opportunity if you offer to install and maintain a tank for them. If nothing else, this gives you the chance to be involved in your child's classroom and allows you to get to know the teacher a little better.

If you're lucky, you'll have a teacher who's truly interested and will want to work with you to learn how it's done so they can handle it themselves in the future. If you're fortunate enough to have a really receptive staff and you have the interest in getting that involved yourself, you may be at the beginning of a wonderful experience, as more and more teachers and parents begin to see the value of the classroom aquarium.

Choosing Materials

If you are an experienced aquarist and will be maintaining the tank yourself, by all means, go with whatever type of system interests you and you are comfortable with. If you are less experienced or will have less experienced people working with you on the tank, the following method is our tried and true beginner-tested "recipe" for setting up a classroom tank. The setups I will describe here have been running in numerous classrooms for an extended period of time now, and there has yet to be a real disaster, in spite of some amusing (in retrospect) beginner-type mistakes that have been made along the way.

The Tank

We have found that for most classrooms, a tank between 10 and 30 gallons is the best size. Smaller tanks can be managed, but they require more attention to detail, and larger tanks usually take up more space than the average classroom can spare. Large aquariums can, however, be wonderful in a common area like the library.

If possible, use a tank that is longer than it is tall. Tall, narrow tanks and those of unusual shapes are difficult to light adequately and are also hard to work in. If you are going to purchase a setup for a classroom, I would suggest either a 20-gallon "high" or "long." Both are fairly inexpensive and are big enough to tolerate some mistakes. For the sake of simplicity, the rest of these instructions will be based on a 20-gallon tank. You can adjust accordingly for other sizes.

Other Equipment and Supplies

Use enough high-quality fluorescent lighting to achieve at least 2 watts of light per gallon. Two 24-inch, 20-watt tubes over a 20-gallon tank are fine. Aquarium strip light fixtures come as either double- or single-tube fixtures, and you can use any combination to meet your needs. You will probably not be able to find a pre-made plastic "hood" tank cover that will provide a sufficient amount of light for a planted tank, so it is best to place your lights above a hinged glass canopy instead.

Make sure the tubes you use are not old and worn out. Start each school year with new tubes for best results. Some good lighting options that are available in pet stores are VitaLite, Pennplax Ultra-Trilux or Triton tubes. Less-expensive tubes from a lighting supply source, such as GE Chroma 50, Phillips Ultralume 5000 or Phillips Daylight tubes, are also perfectly adequate. You will also need a light timer (like those used when people go on vacations) to turn the tank lights on and off each day.

A 150-watt heater should be adequate for a 20-gallon tank unless the room gets very chilly on weekends and during vacations. Buy a high-quality, submersible heater. Don't skimp here — a classroom tank is left unattended too often to risk losing your plants and animals to a faulty thermostat!

Any aquarium thermometer will do, but I prefer the stick-on-the-glass, liquid crystal type for several reasons. They are unobtrusive, yet easy to read. They are inexpensive and most are marked with both Fahrenheit and Celsius scales, which makes them a useful learning tool.

Choose either an internal or external power filter. There are many good ones on the market, but my preference is for those that have rinsable, reusable filtration media rather than those with disposable "cartridges." They are also less expensive to maintain and more environmentally friendly. Any good pet shop can tell you which size filter to get for your particular tank, but it is better to slightly oversize the filter than to skimp. Some filters that are designed to take disposable cartridges also offer plastic frames that can be fitted with your own filter media, which can be purchased in bulk.

With most water supplies, unless they are very soft, your plants will do better with some form of carbon dioxide (CO_2) supplementation. A juice bottle yeast reactor (see "Juice Bottle Yeast Reactor for Carbon Dioxide Supplementation" below) works very well on a 20-gallon tank and is an interesting learning tool in its own right.

Most classrooms are short on available electrical outlets, so you will need to use a heavy-duty power strip to provide power for your aquarium equipment. If you cannot locate the tank near an outlet, use a heavy-duty extension cord. Make sure to remind everyone involved with the tank to unplug the tank from the electrical source before doing any maintenance within the tank. In classrooms with younger children, we make sure that all outlets, plugs and so on are behind a bookshelf or something similar that keeps them out of reach of small fingers.

Remember, an aquarium is heavy! Filled, it will weigh close to 10 pounds per gallon. For smaller tanks, a sturdy counter should provide adequate support, but larger tanks really need a properly designed aquarium stand.

You can either use fine, natural-color aquarium gravel or find a less expensive source, but whatever you use, it should be between 1 to 3 millimeters in size and should not contain calcium carbonate-bearing rock. You can test this by placing a drop or two of muriatic acid (available at the hardware store) on a sample of gravel. If it foams, don't use it. You will need about a 25-pound bag for a 20-gallon high tank, slightly more for a 20 "long." We use "traction sand" from our local hardware store.

Laterite is an iron-rich tropical clay that will serve as the nutrient base for your plants. Ask your local pet store if they either carry it or can order it for you. If not, there are several mail-order sources in the various aquarium magazines that carry laterite and other plant-related products.

Setting Up the Tank

To begin with, place the tank on a stable, level surface. If there is even the slightest unevenness in the support, the tank can develop leaks. Place a couple of sheets of corrugated cardboard or a sheet of styrofoam underneath the tank in case of minor irregularities on the surface. Any excess can be trimmed off close around the tank. This is also a very good idea if you are using an open metal aquarium stand. The styrofoam will prevent heat loss from the bottom of the tank.

Before you go any further, fill the tank with water, wait about 20 minutes to see if there are any leaks and then empty it. This may seem like an annoying waste of time, because most tanks will not leak. But believe me, if you've ever had one that does, you will be much more annoyed if you find out about the leak after the tank is fully set up and running.

Install the thermometer, filter and heater, but don't plug anything in yet. Set your heater to approximately 76 degrees Fahrenheit unless you will be maintaining fish that specifically need warmer (like discus or rams) or cooler (like goldfish or white cloud mountain minnows) water.

Rinse the gravel under running water until the water runs clean. The better you rinse your gravel, the less cloudy the tank will be when it is first filled. Mix the laterite into the damp gravel in a bucket. Use enough gravel to make about a 1- to 1½-inch layer on the bottom of the tank. Be prepared — this step is messy! You might want to wear rubber gloves. Add the gravel/laterite mixture to the tank. While you want the gravel to be damp, try to avoid introducing any standing water into the aquarium.

Next, top the substrate with enough plain rinsed gravel to bring the total depth to 3 inches. Level the front edge of the gravel carefully, so it looks neat once the tank is filled. If you are planning to use driftwood or any decorative rocks, they can be placed in the tank now.

The next step is to fill the tank about three quarters full of water. The water should be between 70 to 80 degrees Fahrenheit. The exact temperature is not critical, but you want to be within a range that will not harm the plants.

How you fill the tank will make the difference between a tank that will be crystal clear by morning and one that can take a week or longer to settle down. Get a shallow saucer or bowl and place it on the gravel. Very slowly, trickle the water onto the saucer. Let it gently overflow the saucer, slowly filling up the tank. When the saucer is completely submerged, you can speed up the flow a little, still aiming the flow at the plate.

If this step is done carefully, the water should be quite clear from the very beginning. If you aren't careful enough, don't panic. The tank may look cloudy for a few days, but it will eventually settle out.

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