

“Sunfish and Students”

Setting Up the Aquarium

Before beginning set-up, please inventory your equipment to make sure that you have everything necessary:

- Equipment (provided by the Department of Natural Resources)
 - Glass aquarium – 20 gallon long
 - Glass canopy – 30” x 12”
 - Hagen AquaClear 50 power filter
 - Ammonia remover
 - Foam 3 pack
 - Whisper air pump – 60 gallon
 - Two 8” air stones
 - Airline tubing – 12 feet
 - Two check valves
 - Penn-Plax Silent Air emergency pump
 - API Freshwater Master Test kit
 - Tetra SafeStart – 100 ml.
 - Prime (Seachem) – 500 ml.
 - Thermometer
 - Small fish net
 - Batteries – 2 size D
- The Department of Natural Resources will supply the food for the bluegills when you receive your fish.
- You will need to provide:
 - A clean (preferably new) 5 gallon bucket for dechlorinating water.
 - A small piece of panty hose to wrap around the end of the extension tube to prevent the fish from being sucked into the filter
 - Metric ruler

Be sure to read all of the instructions that come with your equipment. You will want to keep the instructions for future reference.

- Always assume that your water is treated with chlorine or chloramine unless you know that it came from a well. You will need to add Prime to chlorinated water (follow directions on the label). Always keep a 5 gallon bucket of dechlorinated water on hand at all times.
- Begin with a clean, leak-proof 20 gallon long aquarium. Place the aquarium in a low traffic area out of the sun and away from heat sources.

- Connect the air stones to the Whisper air pump
 - Measure and cut two pieces of tubing so that they are long enough to reach from the air pump to the bottom of the tank. Attach one end to each outlet on the pump.
 - Cut each piece of tubing in half and insert a check valve as shown in the directions that come with the valve. In case of a power outage, the check valve will prevent water from siphoning out of the tank and into the pump.
 - Attach an air stone to the other end of the tubing and attach one on each end of the tank about two inches from the bottom
- AquaClear filter
 - Set up filter according to the directions.
 - Substitute the ammonia remover for the charcoal.
 - If the fish are small, you'll need to wrap a piece of panty hose around the end of the extension tube and secure it with a rubber band. This is to prevent the fish from being sucked into the filter.
 - Attach filter to the center back of the tank. Do not plug it in yet.
- Begin filling the aquarium with water. If your water contains chlorine/chloramine (i.e., is not well water) add one capful of Prime when you have about an inch of water in the aquarium.
 - As you fill the aquarium, discard a cup of water from the bucket and add a cup of water from the aquarium every five minutes or so. This will get the temperature of the water in your bucket as close as possible to the temperature of the water in the aquarium.
 - Fill the aquarium with water to within an inch of the lip of the filter. Mark the water level with a waterproof marker.
- Prime the filter with water from the aquarium
 - Adjust the water flow control lever on the intake tube to its maximum position (all the way to the left).
 - Plug in the filter. Once the filter is working, move the water flow control lever to the lowest setting (all the way to the right).
- Plug in the air pump.
- Add entire bottle of Tetra SafeStart to start the nitrogen cycle.
- Remove the emergency pump from the bucket and set it up in the tank. This will provide aeration if your power should go out.
 - Make sure the air stone will reach the bottom of the tank.
 - Turn the pump on to make sure it is working. Leave it on and plug it in. **The pump should stop working.** It will go on if the electricity goes off.
- Put the glass canopy on top of the tank.
- Now it is safe to put the fish in the tank.
 - Check the water temperature in the bucket and the tank to make sure they are the same.
 - Pick up the fish gently in the net and place them in the tank.

Maintaining the Aquarium

Before working with the aquarium, be sure to rinse hands thoroughly with warm water. DO NOT USE SOAP!!! Even a small amount of soap may be fatal for the fish. Be sure to wash hands thoroughly with soap afterwards.

Water Quality

You will be testing the water in your tank for ammonia, nitrites, nitrates, pH and temperature. All the materials necessary are in the kits provided; follow the directions included in the kits.

The ideal water quality parameters for your bluegills are:

- Ammonia – optimum level is 0 ppm; bluegills can survive total ammonia levels of 2.5 ppm and total unionized ammonia of 0.12 ppm (See the note about ammonia below.)
- Nitrites – optimum level is 0 ppm
- Nitrates – less than 40 ppm
- pH – 6.5-8.5
- Optimum temperature – 18.3°-26.7°C (65°-80°F); bluegills can tolerate temperatures as high as 30°C (86°F)

When your fish are first introduced, there will be a spike in the levels of ammonia, nitrites and nitrates; this is called “new tank syndrome”. **When the fish are first added, you will need to test the ammonia, nitrite and nitrate levels daily until the levels are in the safe range!!** Once the nitrogen cycle is established, the levels should remain stable. If the water chemistry levels are high, see the section on “Trouble Shooting”.

A note about ammonia. In water, ammonia occurs in two forms, ionized and unionized, which together are called total ammonia nitrogen (TAN). Of the two, the unionized form is much more toxic to fish and is affected by temperature and pH. At high temperatures and high pH, there is more unionized ammonia. Your test kit measures TAN, but if you know the temperature and pH, you can go to the following website to calculate unionized ammonia: <http://aquanic.org/images/tools/ammonia.htm>. The unionized ammonia level should be less than 0.12 ppm. If the level is higher than this, add AmmoLock.

The goal is to have 0 ppm total ammonia, but this may not always be possible, especially in the beginning. In fact, there may be times when the total ammonia is high but the unionized ammonia is within safe levels.

Filter

The filter should be checked to make sure that it is running properly. It may not come back on after a power failure. If it is not on, add water; it should start up again. Make sure that the pantyhose over the extension tube is clean. Change the filter inserts and clean the filter according to the directions that came with the filter.

Air Stone

The air stones should be bubbling at all times. They do wear out with time; replace them if you notice a decrease in output. Be sure to check the air stone on the emergency pump when you check the pump.

Emergency Pump

The emergency pump is very important; if the power goes off, the pump will help maintain crucial dissolved oxygen levels. The pump should be checked monthly and before a vacation. With the pump turned on, unplug it. It should automatically come on and bubbles should come out of the air stone. If it does not, replace the batteries.

Water Level

The water in your tank will evaporate, even with the lid on. Keep a bucket of dechlorinated water handy. When the water level falls more than an inch or so below the marked level, add dechlorinated water. Never add water straight from the tap.

Water Changes

Routine water changes are best method for keeping an aquarium healthy. A water change consists of removing aquarium water and replacing it with an equal quantity. The water must always be dechlorinated and at the same temperature as the water in the tank. Water changes are also used for bringing down levels of toxic chemicals (ammonia, etc.) and improving water clarity. If water quality parameters are in the safe range, a weekly 25% water change should be sufficient.

Debris

Remove any uneaten food or other debris with a small net or turkey baster.

Remember - It is much easier to maintain an aquarium on a routine basis than to try to correct a problem once it has developed. You might want to set up a checklist for you and your students.

Trouble Shooting

Spike in Nitrogen Levels:

You may have a spike in the nitrogen levels right after the fish are added. These chemicals are toxic to fish and must be dealt with immediately. **When the fish are first added, test the water quality daily until the nitrogen cycle is established and the levels of ammonia, nitrite and nitrate are stable and within the safe range.**

Ammonia/Nitrites Too High:

If the ammonia level (especially unionized ammonia) is too high, add Ammo Lock according to the directions. This will block the ammonia so that it is not toxic. (It will not remove it and therefore the readings will remain high.) Do a 25% (5 gallon) water change. Check the water chemistry the next day and if levels are still high, do another 25% water change and add AmmoLock. Continue testing the water quality, doing water changes and adding AmmoLock as often as necessary until the levels come down and become stable. **Remember: AmmoLock is your friend!**

A spike in nitrogen levels after the nitrogen cycle has become established is usually caused by overfeeding and subsequent decay of uneaten food. If this happens, cut back on the amount of food and follow the directions above for lowering the nitrogen levels. Be sure to check for uneaten food each day and remove any with the turkey baster.

Cloudy Water

The most common cause for cloudy water is overfeeding. Remove any uneaten food and adjust the feeding. You may need to do a 25% water change for a few days until the cloudiness goes away.

Sometimes in a new aquarium there is a bacteria bloom when the SafeStart is added. This is not harmful and will go away.

Algae

If your tank has a green, blue-green or brown growth, it is algae. Algae are not harmful; in fact, they produce oxygen and use up nitrates. However, they often are not very attractive and may block your view. If that is the case, scrape the growth off the sides of the tank using an algae scraper, available from the pet store. To reduce algae growth, reduce the amount of light the tank receives.

Feeding Your Bluegills

The food for your fish will be provided by the Maryland Department of Natural Resources. **The food must be kept refrigerated.** At first, the pellets will be too big for the fish and will have to be broken up by hitting them with a crab mallet or rolling pin.

Your bluegills are juveniles and like most babies, they prefer to eat several small meals spaced over the course of the day rather than large meal. Try feeding them at least twice a day. They will be fine without being fed over the weekend.

How much to feed is a matter of trial and error – too much food will foul the tank, while insufficient food will cause your fish to become malnourished. This is why it is crucial to monitor both your tank's water quality and your fish's growth. At first, your fish may eat only a few pellets at each feeding. For the first couple of weeks, watch the fish between feedings. If there is uneaten food left when the next feeding begins, decrease the amount of food. If all the food is eaten immediately, increase the amount of food slightly. Obviously, if your fish are not growing, you will need to increase the amount of food. Your fish will also require more food as they get bigger. Use your weekly measurements as a guide.

Be sure to keep a record of how much you are feeding daily. You can measure either by weight or by dry measure.

Measuring Your Bluegills

Your fish should be measured every two weeks. You will not hurt the fish by taking it out of the water to measure it, but you want to do it as quickly as possible. You may want to measure several and take an average. **When handling the fish, be careful of the spines in the dorsal fins!**

To measure total length:

- Lay the metric ruler on a hard surface.
- Place the fish on the ruler with the tip of the mouth on the 0 mark.
- Measure to the tip of the tail.

Routine Care and Maintenance Schedule

Be sure your hands are soap free before you start. Wash your hands thoroughly when finished.

Daily:

- At first, you will need to do water quality testing, and possibly a 25% water change daily until levels are stable.
- Check the activity level of the fish
- Look for uneaten food – remove any if present and reduce the amount being fed
- Check the filter and air stone to make sure they are running properly
- Make sure the pantyhose is clean.
- Check the water clarity – if the water is cloudy, do 25% (5 gallon) water change. Determine the cause of the cloudy water.

Weekly:

- Record the amount of food being fed daily
- Check water level – add more dechlorinated water if necessary
- Once the water quality parameters are stable, water chemistry tests can be done weekly.
 - Ammonia
 - Nitrites
 - Nitrates
 - pH
 - Temperature
- Do a 25% water change.
- Remove algae from glass if needed

Monthly:

- Check the emergency pump
- Change ammonia remover insert

Every 2 months:

- Change foam insert

Every three months

- Change BioMax insert
- Clean filter according to package directions