

Aquariums For Schools





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CANADA**

I would like to take this opportunity to thank you for participating in the Aquariums for Schools program. This program was developed to help engage students in discussions while furthering their understanding, appreciation and studies of eco-systems, wetlands and the natural environment that surrounds us all.

I sincerely hope that the addition of an aquarium will bring a new dynamic and teaching aid into the classroom, which stimulates the learning process.

We also hope that by participating, the students will develop a sense of responsibility in being a good steward towards the environment.

On behalf of the Aquarium Club of Edmonton, I wish you enjoyment of your aquarium. We would like to thank the following for their help making this program possible: Paul Lennon, KimBerley Kern.



Aquariums for Schools
Aquarium Club of Edmonton



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Information Guide



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Introduction

“The mirror like shimmering that often accompanies bodies of water, does not allow us to see beneath its surface. An aquarium gives us the opportunity to peer into this underwater oasis and discover it for ourselves.” RK

The Aquarium Club of Edmonton and other such societies have been a part of the Edmonton area since the 1950's. Aquarists' have gathered to share their passion for the keeping of fish. It is because of this passion that the “Aquariums for Schools” program was developed; it began as a thought...

“Wouldn't it be nice if...”

We could facilitate a way to see that children who grow up in the Edmonton area have the opportunity to experience the fascinations that an aquarium brings by the time they finish grade school. The ideal scenario would include an aquarium setup within a classroom in every school; funded, financed and administered in partnership with members of the Aquarium Club of Edmonton, fellow aquarists, aquarium shops, wholesalers as well as teachers or anyone else that has the desire to make this dream become a reality.

The idea is simplistic, yet provides an engaging and interactive experience for both students and the teacher. If embraced, it can be a powerful complement to the existing curriculum; creating awareness to the significance and fragility of wetland eco-systems and the need for responsible stewardship towards the environment. These values can never be instilled too early in an individual's life.

The objectives of the Aquarium Club of Edmonton are;

- To gather, organize, and disseminate any information on aquatic life, without limiting the aforesaid, including the study of aquatic life.
- To encourage the preservation of aquatic life.
- To encourage the advancement of fish keeping and the other aquatic life.
- To develop and maintain a library on aquatic life.
- To promote fellowship amongst its members and other societies with similar objectives.



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1. Check List & Liaison Contact

We suggest that you fully read the complete guide before proceeding.

Contents of Aquariums for School Program Package:

☐ Aquariums for Schools Guide

☐ Aquarium Kit



☐ Gravel



☐ Timer



☐ Basic Aquarium Book (to be donated to the school library)



☐ Aquarium Background



☐ Bucket



☐ Siphon hose

☐ Gift Card/Certificate

Other Items that will be helpful to have on hand:

☐ Towel

Your Aquarium Club of Edmonton liaison for this program:

Name _____

Phone Number _____

E-mail _____

If you have any concerns or questions, please do not hesitate to contact me!



2. Getting Started

It is left to the teacher's discretion as to how much involvement students have in the setting up of the aquarium, but we do encourage you to include them in as many aspects of the installation whenever possible.

Setup:

- Rinse out aquarium to remove dust and debris; never use soap or cleaner.
- Find a sturdy location for placement of the aquarium, once full, an aquarium weighs approximately 10lb or 4kg per gallon (NEVER MOVE A FULL AQUARIUM).
- Avoid placement of aquarium near heating or cooling ducts.
- Over exposure to direct sunlight can result in excess algae growth, therefore, should be avoided.
- Adhere background wallpaper to the back (outside) of the aquarium with clear tape.
- Rinse gravel with tap water using a fishnet and/or bucket to remove dust and debris (this may have already been done for you).
- Add the gravel, sloping highest at the back, to give the tank more depth.
- Rinse and add all hardscape (rocks, driftwood, plastic plants, etc.) before adding water.
- Use a clean bucket to help fill the aquarium, never use a bucket that has come into contact with soaps or cleaners.
- Add conditioner (de-chlorinator) to the water to remove chlorine and chloramines that are harmful to fish and plants. It is normal for the aquarium's water to initially appear cloudy; this is caused by small floating particulate.
- Install the filter with media and heater (following instructions) once the aquarium has been filled with water. Filter media includes sponge, carbon, and bio media.
- "Cycling" products can be added to the filter to add "beneficial bacteria".
- **Never run your filter dry; this could result in damage to the motor.**
- Adjust the heater temperature to 25C/78F. **Do not plug in heater until it is in the aquarium and water has been added; a dry heater that is plugged in will crack.**
- Adhere the thermometer to the outside lower portion of the aquarium; use it to verify the aquarium temperature. Check it periodically to see if the heater is maintaining the desired temperature.
- Add fluorescent bulbs to the canopy.
- Set timer and plug in lights to maintain a 8-10 hour photoperiod. **Ensure that only the lights are plugged into the timer; filtration & heater must be maintained 24 hours a day, 7 days a week.**
- At this point the aquarium is setup and almost ready to house its new residents.
- Over the course of the next week ensure the temperature remains at the desired temperature and the lights and filter are functioning properly. Although the aquarium may initially appear cloudy this should gradually become clear.

- Live plants can be added immediately but the addition of fish should wait for several days or even a week before being added.
- Further setup and care instructions can be found in the “Setting up an Aquarium”, “Hagen’s Basic Aquarium Guide” and on the DVD included in the kit.

3. Live Plant & Fish Selection

Live plants are best added before fish are introduced; their presence can greatly enhance the aquarium setting and environment for the fish. The following are a few suggested plants to consider for your aquarium. This is by no means an exhaustive list but rather a starting point for your selections. (Latin names are used, as common names are not always available). It is better to select several plants from one species than one of each. Choosing plants of different sizes that are appropriate for the background and foreground may also be a helpful with your plant selection.

Cryptocoryne species	Bacopa species
Java Fern species	Ludwigia species
Anubias species	Hygrophilia species
Vallisneria species	Sword Plants (Echinodorus species)
Sagittaria species	

All plants should have their individual pots (including most of the plant media) or weighted banding removed, roots trimmed and planted strategically into the gravel to make a visual aquatic landscape.

Selecting fish is sometimes the most fun of all, but care must be taken to do so carefully. For this program we recommend that you setup a community style fish tank. When visiting a pet store make sure to mention to staff that you require fish that are compatible for a community style aquarium.

Fish selection should be done with the following general criteria in mind:

- Healthy “looking” fishes do not possess damaged fins or scales, white or red blotches or other skin lesions.
- Fish should be active and show lively swimming behavior; although keep in mind that some fishes are a little shyer by nature.
- For fish to exhibit their natural behaviors it is best to house them in small groups as opposed to one of each kind.

Other valuable points

- Never overstock the aquarium; a reasonable guideline is 1” of fish per gallon of water; keeping in mind the adult size of the fish at maturity.
- Several small algae eating fish should be introduced at setup time.
- Select fish that cover the different levels in the water column (top, middle and lower).
- For an example, a single species tank can also be done using only guppies, platys or swordtails with only a few algae eating otto cats as algae eaters added.
- The choices are vast, as you will discover when you visit your local pet store.
- Enjoy your aquarium!

When adding new fish, float the bag(s) in the aquarium for about 10 minutes to acclimatize the water temperature in the bag. Open the bag and pour in some aquarium water into the bag and wait another 10 minutes. Then carefully net the fish out of the bags and release into the aquarium avoid pouring water from the bag back into the tank. Dispose of remaining water down the toilet or sink.

Recommended selection of fish to consider:

Ottocinclus (Otto cats) whenever possible should be added for algae control

Corydoras Catfish	Barbs	Gouramis
Guppies	Platys	Swordtails
Tetras	Angelfish	Neons
Kribensis	Siamese Fighting Fish (one only)	
Rasboras	Danios	

4. Aquarium Fish Varieties

Fish kept in an aquarium can usually be categorized into three groups; fresh water, brackish water and salt water/marine fish.

The most commonly kept aquarium fish are of the fresh water variety. They can be found in lakes, rivers, streams, ponds and even puddles; thousands of species are known and kept. Brackish water fish live in the coastal areas between the oceans and the rivers that feed them. Salt water/marine fish are those that most often are inhabitants of ocean reefs around the world.

Fish were originally collected from the wild, but most of the fish available in the pet stores today are bred and raised for the aquarium hobby.

Most aquarium fish are relatively small, but possess distinct characteristics such as markings, shape or colors. Fish can be further classified by observing which part of the aquarium they spend most of their time in: bottom, mid-water or surface. They spend the majority of their time in the portion of the water column that they normally catch food or feed in. The anatomical features of their mouths provide a good indication as to where they dwell in an aquarium. Fish with upturned mouths feed mostly from the water's surface. Opposite to those, with a down turned mouth, are fish that forage through the substrate or bottom. Those fish with forward facing "snouts" obtain their food from the mid-water region. Although these are guidelines, fish will not pass up an opportunity to feed at any level of the aquarium as the need arises.

What area of the aquarium do you observe your fish in?

5. Feeding

Overfeeding can probably be the single greatest challenge for the classroom aquarium. Given that a fish's stomach is only about the size of its eye feeding should always be **extremely regulated**. Once the fish have become accustomed to their new surroundings they will always “look” and act like they are hungry when students or anyone approach's the aquarium. Although small portions of food fed many times a day is acceptable, close observations should be made to ensure that no uneaten food is accumulating on the substrate as this can affect water quality.

A small amount of fish food is included in the kits provided; other types and varieties should be acquired in accordance to specific need of the fish selected. Variety is the spice of life even for a fish.

Only feed fish the amount of food for which they can consume within a couple minutes. “A good rule to follows is: *“Less more often is better than more less often”*”.

If fish are well fed during the school week it is usually unnecessary to have them fed during holidays and/or weekends. An automatic feeder can be used, but one is not included in this program.

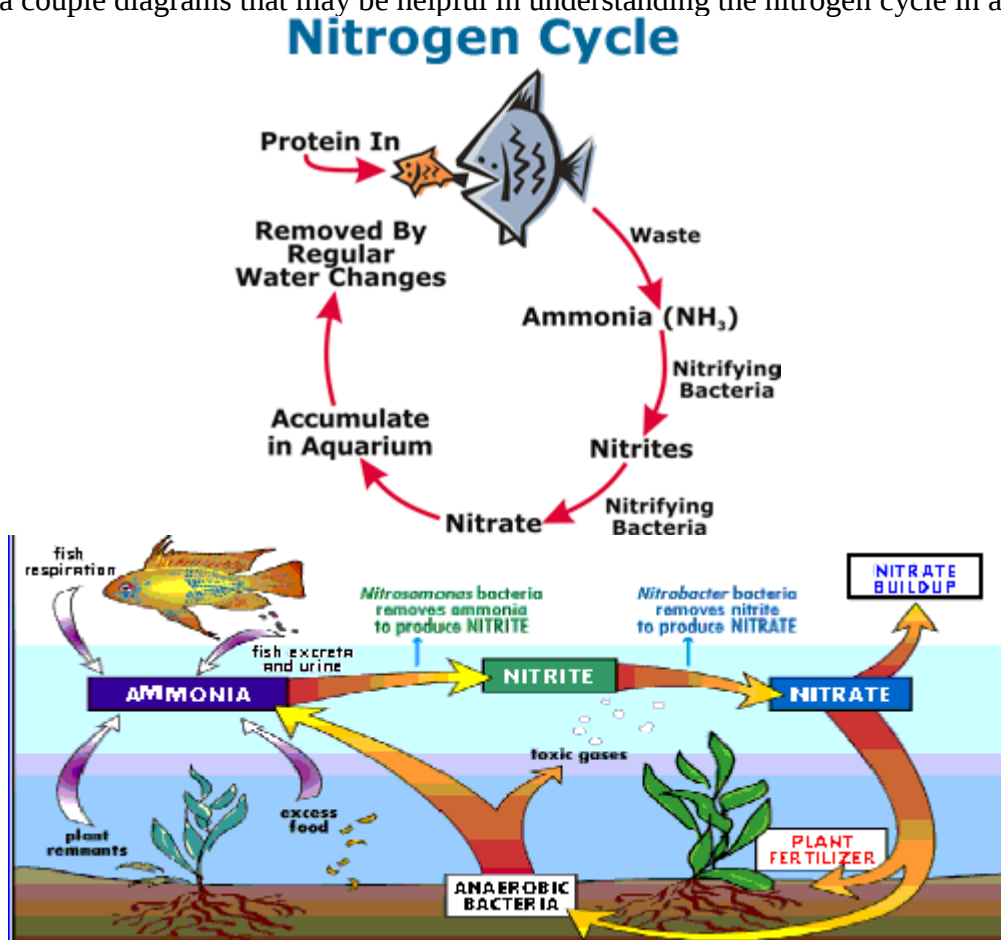
6. Nitrogen Cycle

The same nitrogen cycle that exists on earth is similar to that which occurs in the closed system of an aquarium; just on a far smaller scale. It is this very process that allows us to keep fish in an aquarium for great lengths of time. Understanding this process is crucial to understanding why and how an aquarium works.

Once fish are added, a natural biological process begins to occur; the *nitrogen cycle*. This cycle cannot occur without the presence of bacteria, which automatically begins to flourish within the aquarium. Wastes produced by fish, uneaten food and deteriorating plants all add to the buildup of ammonia and nitrite in an aquarium; both of these are detrimental to the well being of the fish. These two lethal substances are in time converted by bacteria in the aquarium but particularly in the filter to become ammonium and nitrate. Once the “cycle” has been established these are no longer lethal. They, however, can buildup in an aquarium and are best dealt with regular weekly water changes of 20%.

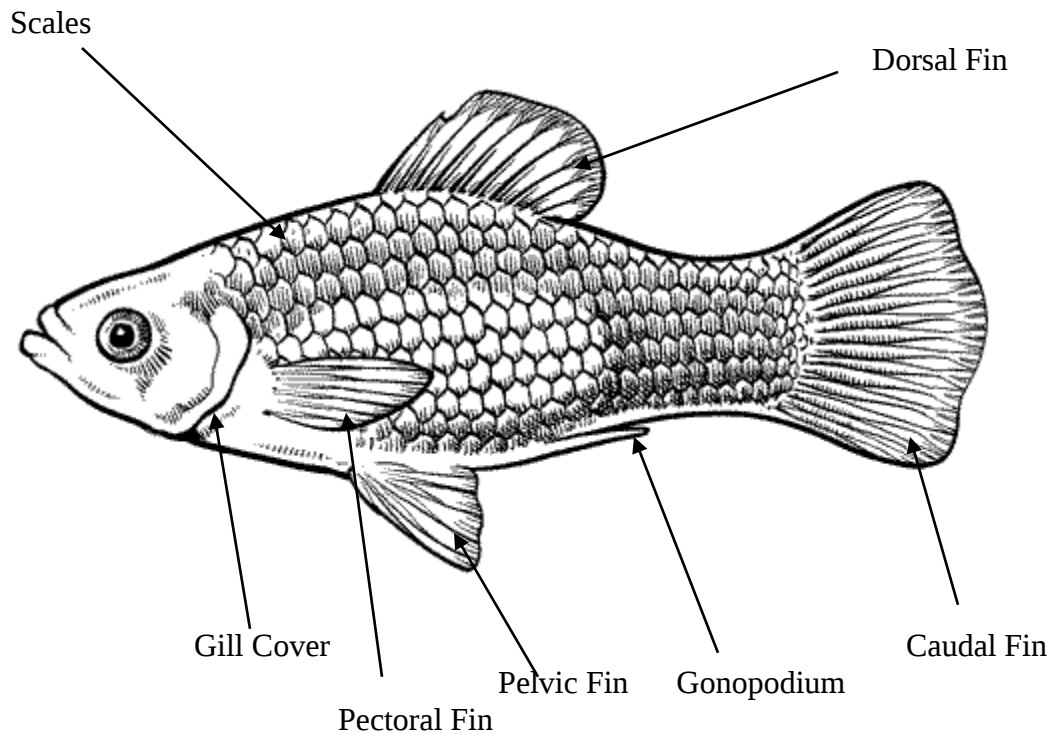
The average aquarium will cycle naturally in about 4-6 weeks. It should be also noted that the “beneficial bacteria” created in the filter which makes this cycle possible should never be subject to rinsing with chlorinated tap water.

Below are a couple diagrams that may be helpful in understanding the nitrogen cycle in an aquarium.

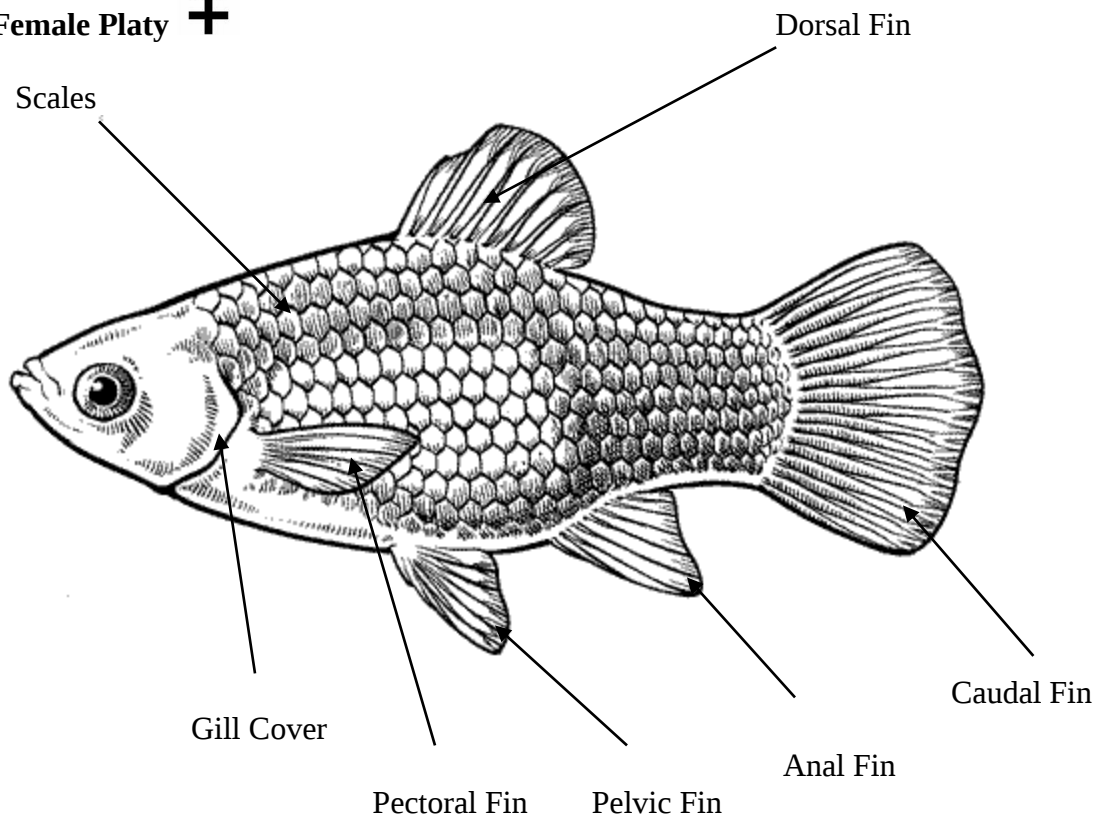


7. Fish Anatomy

Male Platy ♂



Female Platy ♀



8. Fish Health

“Having a successful aquarium includes starting with fish that are healthy.” What are some the key indicators of health?

1. Life span. Fish life spans vary, but a general guideline is several years. It is not always easy to tell what the age of a fish is. If you look closely, you can observe the rings on their scales (similar to trees), but this can be difficult.
2. What is the condition of other fish residing within the same tank? Any fish appearing lethargic covered in white spots or lesions, demonstrating “clamped” fins or showing signs of itching, are fish that are probably sick. It is advisable not to purchase any fish from a tank where fish are exhibiting any of these characteristics.

What are some factors that affect health of fish?

1. A fish experiencing stress is more likely to become sick; no different from humans. Fish become stressed for many reasons:
 - Temperature of the aquarium is too warm or too cold.
 - Any form of handling of the fish, including shipping, netting, and transferring fish from one environment to another. Healthy fish can handle brief periods of stress, but any underlying conditions may make the effects of stress terminal for a fish.
 - **Tapping on the glass is extremely stressful for inhabitants of an aquarium. It is important to reiterate this point with all those who come in contact with the aquarium.**

If you have any concerns regarding the health of your fish, please contact your liaison as soon as possible.

10. Freshwater & Saltwater

Did you know the earth is most often referred to as the “blue planet” because the earth’s surface is covered in with about 70% water?

Most of that water is contained in our oceans; thus being saltwater. Freshwater only accounts for approximately 2 % of the earth’s overall water supply. In our environment, water is constantly being recycled and it is hard to believe that there is no more water on earth now than when the dinosaurs roamed upon it. We have many marshy and wetlands areas throughout the world. Once thought to be wasteland, it is now understood that these areas are not only a habitat for a wide range of wildlife but is in fact Mother Nature’s filtration system.

Both freshwater & saltwater (marine) aquariums can be kept; this program is designed for only freshwater aquariums. Many principles for both styles of aquariums are similar, but the keeping of marine aquariums is considered slightly more advanced. If you are interested in information about saltwater aquariums, please visit your local library or contact an aquarium society or club within your area.

11. Maintenance & Observation Log

Once an aquarium has been in operation for several weeks it is considered established and should require only minimum maintenance to keep it functioning. Daily observations should be made of the aquarium and its inhabitants. All equipment is new, but verification that the equipment is functioning properly is recommended weekly. **Over feeding & over-populating is the main cause of excessive maintenance requirements.** Weekly change of 10-20 % of the water is recommended. The tank supplied for this program generally requires the removal of ½ 5-gallon pail of water and replacement with de-chlorinated water. Cleaning of filter material as required can be done with the removed tank water at this time (similar temperature of water).

Cleaning of the filter can be done with the removed tank water at this time. Never clean filter material under the tap or replace all filter material at once. Always use aquarium water to rinse filter media. The amount of evaporated water from the aquarium does not constitute a portion of the recommended water change.

Cleaning of glass should be done as required both inside the aquarium and out using non-abrasive items and without any cleaning chemicals. A gravel cleaner or hose is best to remove water from the aquarium and makes the removal of any debris easier. Having the students create a weekly log of the maintenance, fish additions, temperature and other general observations should be encouraged.

12. Fun Facts & Answers to Questions

- The world's first public aquarium was opened in 1853 in London.
- There is currently an estimated 60 million-aquarium hobbyist's worldwide.
- Penguins have an organ above their eyes that can convert saltwater to freshwater.
- The Amazon is one of the worlds longest and perhaps oldest continuously flowing river systems and contains the largest number of freshwater tropical fishes species in any single watershed.
- Over 26,000 species of fresh & saltwater fishes are currently known with over 200 added annually.
- Can fish hear? Yes, although they may not hear exactly as we do, they can hear via an inner ear and their lateral line. **It is thus very important not to tap or bang on an aquarium at any time; it is important to share this fact with the students.**
- Do Fish Sleep? Well kind of, but because they do not have eyelids it may seem that they are always awake. They can sometimes appear on the bottom of the aquarium in an almost suspended form during the night where they are simply at rest.

13. Year End Procedure & Feedback Form

At the end of the year the aquarium and all of its contents are to be given away to one of the students. The *Setting up an Aquarium* book can remain in the school library. Please complete this form and return it to the address below. Any pictures and feedback are greatly appreciated.

School Name: _____

Family name and address of student who received the aquarium: (this information will be used solely to send family newsletter from the Aquarium Club of Edmonton **and will not be disclosed or published for any purpose.**)

Family Name: _____

Address: _____

Did the students enjoy maintaining the aquarium?

How many kids were in the class? _____

Did you encounter any problems setting up or maintaining the aquarium?

What types of fish were purchased for the aquarium?

Would your school be interested in participating in this program in the future?

Comments or further suggestions:

Thank you for participating in the Aquariums for School program!

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