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# Keeping fish

A detailed illustration of a goldfish, likely a Koi or similar breed, swimming towards the right. It has a golden-yellow body with some darker markings, a large eye, and a slightly open mouth. The fish is positioned below the word 'fish' in the title.

Welcome to ***Keeping Fish***, an *Aquarium Primer For Keeping Fresh And Saltwater Fish*.

Whether your planning on starting a freshwater fish tank or a saltwater aquarium, it goes without saying that it will be much more rewarding in the long run to do things right, right out of the box.

Not everything about fish is as intuitive as an inexperienced hobbyist may think. For example, it may not be obvious to everyone that you shouldn't keep big fish in a small tank, or that small fish probably won't fair well with larger more aggressive stock. And, unless you follow the advice of the store clerk where you buy Betta fish, you may not know that putting multiple male Betta fish in the same fish tank is a bad idea!

As for general maintenance and setup, there are some essential steps that must be observed before your fish are ever introduced to their new home.

This brief primer will help you walk away with a better understanding of what is involved with creating a stable and healthy environment for your fish.

## Table Of Contents

Freshwater vs Saltwater.....	3
Tank Considerations .....	4
Size of the Aquarium .....	4
Capacity of the Aquarium.....	6
Tank Setup.....	7
A Note on Filtration .....	7
Cycling the Aquarium .....	8
Water Maintenance .....	9
Adding Fish .....	10
Caring For Your Fish .....	11
Maintenance Schedule .....	12
10 Basic Rules For A Successful Aquarium .....	13
10 Things to Consider BEFORE You Buy Your Aquarium ....	13

## Freshwater Aquarium vs. Saltwater Aquarium

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Each environment has its own unique criterion, including ongoing costs, everyday maintenance, and related fish care requirements. Sure, a **saltwater** (SW) tank requires considerably more work and attention, but it's hard to beat the satisfaction of knowing that you created a unique environment for warm water fish that few aquarists enjoy.

Obviously, many will argue that a freshwater (FW) system has its own merits. Most notably is the fact that SW environments seldom allow for "live" rock, live corals or other sessile or motile invertebrates. And, depending on your motive for building an aquarium in the first place, these additions can be equally enjoyable to care for, giving freshwater enthusiasts another reason to enjoy a cold water fish environment.

At the end of the day, personal preference dictates which setup is right for you. Of course, practically speaking, so does a budget. But if the commitment to creating and maintaining either type of system isn't daunting enough to keep you away, you'll be rewarded by your efforts from the moment your fish are introduced to your tank!

### A Snapshot Comparison Between The Two Aquatic Systems

#### SALTWATER

- Requires specially formulated salt water
- Requires high calcium levels
- Larger fish population
- Stricter maintenance schedules
- Specialized filtration
- Requires a heater
- More costly

#### FRESHWATER

- Can use tap water
- Avoid calcium-containing objects
- Smaller fish population
- More forgiving maintenance schedules
- Simpler filtration requirements
- No heater required
- More economical

## Tank Considerations

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Whatever setup you'll be using, purchasing an aquarium involves more planning than you might think. For instance, your decision to purchase a specific shape of aquarium will directly impact how many fish you can add to your tank, based on the amount of surface area that can support an adequate amount of oxygen exchange.

Additionally, you'll need to consider its location (avoid excessive sunlight, drafts, and other potential temperature extremes), the needs of the fish that will live in it, and maintenance. Initially, the most obvious requirement is whether to go with an acrylic, or glass tank.

Briefly, the characteristics of a *glass tank* are...

- Heavy
- More likely to chip
- Less likely to scratch (easier cleaning)
- Requires support only along the outside edges of the tank

Conversely, the characteristics of an *acrylic glass tank* are...

- Lightweight
- Better insulator
- Clearer (less distortion; more light)
- Requires support along the entire length of the bottom of the tank
- More expensive
- Less likely to chip
- Easily scratched
- Greater variety of shapes

## SIZE OF THE AQUARIUM

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The size of the tank typically dictates the number of fish that may be safely kept in it. The general rule of thumb is **one inch of fish per net gallon of water**, bearing in mind that the fish you buy in the pet store are probably not full grown yet and will only get bigger. Also remember that thicker-bodied fish require more space than slim-bodied fish.

Generally speaking, the larger the aquarium (or fewer the fish), the greater your chance of maintaining a stable environment. This is an obvious case of, "bigger is better."

Know that an aquarium holding more than 15 gallons of water will weigh over two hundred pounds so, be sure that to use an appropriate stand. Consider the following table for determining tank weights and ultimately, your tank's permanent location.

## Basic Aquarium Sizes

(Weights Are For *Glass Aquariums*; Acrylic Will Weigh Less)

SMALL AQUARIUMS (Not Recommended For Beginners)		
Tank Size	L x W x H	Filled Weight
2 1/2 gallon	12" x 6" x 8"	27 lbs
5 gallon	16" x 8" x 10"	62 lbs
10 gallon "Leader"	20" x 10" x 12"	111 lbs
15 gallon	24" x 12" x 12"	170 lbs
15 gallon High	20" x 10" x 18"	170 lbs
MID-SIZED AQUARIUMS		
Tank Size	L x W x H	Filled Weight
20 gallon High	24" x 12" x 16"	225 lbs
20 gallon Long	30" x 12" x 12"	225 lbs
25 gallon	24" x 12" x 20"	282 lbs
29 gallon	30" x 12" x 18"	330 lbs
30 gallon Breeder	36" x 18" x 12"	348 lbs
40 gallon Breeder	36" x 18" x 16"	458 lbs
40 gallon Long	48" x 12" x 16"	455 lbs
LARGE AQUARIUMS		
Tank Size	L x W x H	Filled Weight
50 gallon	36" x 18" x 19"	600 lbs
55 gallon	48" x 13" x 21"	625 lbs
65 gallon	36" x 18" x 24"	772 lbs
75 gallon	48" x 18" x 21"	850 lbs
90 gallon	48" x 18" x 24"	1050 lbs
125 gallon	72" x 18" x 21"	1400 lbs
150 gallon	72" x 18" x 28"	1800 lbs
180 Gallon	72" x 24" x 25"	2100 lbs

**Note:** Don't make the assumption that your tank will hold this exact amount of water. Remember that the volume of your tank will also include such things as gravel, rocks, plants, and various decorations – things which disperse the water volume indicated in the above chart. In reality, ***your tank's water volume will often be 10-15% less than the actual capacity of the tank.***

## **CAPACITY OF THE AQUARIUM**

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The amount of oxygen available to fish is critical for their survival. Not only does the size of the tank matter, but its shape also affects the efficiency of the exchange of oxygen and carbon dioxide. Naturally, larger surface areas result in more oxygen entering the water so avoid tall thin tanks, and opt for longer ones.

In thinking ahead to the amount of fish you want to add to your tank, you'll need to know the amount of available oxygen exchange that can support the maximum amount of fish. Don't worry about the math, it's simply a matter of calculating the surface area of the tank by multiplying the length times the width of the aquarium (in inches) and dividing by 12 to get the number of inches of fish the aquarium can handle.

**Note:** **Cold/freshwater aquariums** accommodate about **2 1/2 times LESS fish than in a warm/saltwater aquarium** so divide the **surface area by 30** to get the number of COLDWATER fish that can be added to a freshwater aquarium.

Finally, be sure to invest in a reliable pump for adequate oxygen supply and consider having a second one on hand in case of failure (and they *will* fail).

## Tank Setup

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Setting up your tank is almost as fun as adding the fish. Apart from making sure that everything is clean and/or in working order, this is when you get to arrange your fish's new home.

Once the tank and stand (and light) is in a safe location, and before the water is added, simply begin adding the contents: filter, air pump, gravel, heater, water pump (if necessary). It makes more sense to add the decorations after the water is in.

Be sure to rinse things first (cold water only) and don't use any soap or cleaners on anything.

Once the water is added, you can add any necessary water conditioner to remove the chlorine and chloramine from the water to kill off any bacteria in the water. Alternatively, letting the water "age" for twenty-four hours will help dissipate any chlorine in the water. Chloramine, on the other hand, will require some kind of conditioning treatment.

Wait an hour or so before turning on any of the equipment.

Now the hard part... wait even longer (up to 6 weeks) for your tank to cycle.

## A NOTE ON FILTRATION

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To effectively maintain an aquarium, a filter should run all the water in the tank through the filter a minimum of four times each hour. Its purpose is to remove excess food, decaying organic matter, chemicals, and waste products.

The most effective filters include each of three different types of built-in filtration (biological, chemical and mechanical) and although they may be more expensive, they're well worth the investment because they provide the most stable and easily maintained environment.

Very briefly, **biological filters** are essential to tank stability and the reduction of toxic wastes, and involve using living bacteria and other microorganisms. **Mechanical filtration** keeps the water clear and free of debris. **Chemical filters** are useful in getting rid of toxins caused by insufficient water changes. Other types of filtration include protein skimmers, ultra violet sterilization and ozone treatment.



## Cycling the Aquarium

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Cycling your aquarium is the first and most important thing you must do to provide a healthy and stable home for your fish. Otherwise known as “the nitrification process” you’re ridding your tank of deadly ammonia and creating a stable environment for your fish.

The time it takes for your tank to completely cycle can vary from 4-8 weeks. ***Do NOT add fish during this process because there is a very good chance they’ll die*** – either from ammonia or nitrite poisoning, or other diseases resulting from a weakened immune system caused by the high ammonia and nitrite levels.

During this waiting period, monitor your Nitrate levels on a daily basis and ONLY when they are at acceptable trace levels (as close to zero as possible) add new fish – a few at a time. This keeps the bacteria growth rate to a minimum and prevents over-stressing the filter. Too many fish will require another cycle. Continue to keep an eye on the ammonia and nitrite levels to make sure the environment remains stable.

“If you have ammonia problems or see signs of ammonia stress after the tank has cycled, then your tank is overpopulated, under-filtered or overfed. Ammonia in the tank is a sign of a problem, not something that is easily treated with a chemical. Use of a chemical to remove ammonia will very often result in starvation of your biological filter leading to more ammonia problems and meaning that you will need to cycle the tank again. *Remember, if your ammonia levels are high, you need to treat the problem that is causing the high ammonia levels, not the ammonia itself, which is just a symptom.*”  
(source: *FirstTankGuide.net*)

Depending on who you talk to, using chemicals to help shorten the cycling time can be a bad idea, and result in a less-stable environment. These tanks usually don’t stabilize for about six months after the last treatment anyway so don’t use chemicals if you want a stable, easy-to-care-for tank.

On the other hand, if for whatever reason, you absolutely must use chemicals, make sure they’re commercially-prepared *aquatic bacteria*. Anything other than *aquatic bacteria* can be harmful to your tank, and ultimately, your fish.

Regardless of the method you use, and the time it takes, *every new setup must go through this necessary process, regardless of whether it’s for a freshwater or saltwater environment.* Failure to understand this and adding fish before the cycle has been established is *the largest contributing factor to the loss of fish.*

## Water Maintenance

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Ammonia and other nitrogenous wastes are recognized as the number one killer of aquatic life in captive conditions. And along with temperature and photoperiod, metabolite build-up (biological waste) is one of the three most important factors influencing the health, growth and reproduction of your fish.

In light of this information, changing your tank's water is probably the single most important thing you can do for your fish (apart from feeding).

There are several major benefits of frequent partial-water changes, not the least of which is the removal of nitrates, excess waste and particulate matter; the reduction in microbial populations and their metabolites; and the prevention of the build-up of toxins.

Various aquarists suggest changing anywhere between 10% and 50% of the water every week. Naturally, this would be a daunting task for a saltwater tank so aim for 15% new water on a weekly basis. By the same token, too much of a water change can be a shock to the fish.

If it's been a while since the last water change, several smaller water changes over a few days is a good way to acclimate your fish to a healthier water quality.

Regardless of how well a system is designed and constructed, there will always be maintenance. Frequent partial water changes are one of the best ways of ensuring continuing success.

## Adding Fish

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The number one mistake that beginners make is to buy a bunch of fish and toss them into the tank. The fish produce ammonia faster than the bacteria colony can grow to handle, and the fish die of ammonia poisoning. Some very hardy fish have a chance of surviving this process, but it likely shortens their lifespan and is very uncomfortable for them. That's why you need to patiently await the time it takes to "cycle" your tank before adding any fish.

Setting up an aquarium properly takes time. As mentioned previously, it can take anywhere from 2 to 8 weeks before you can add any fish safely to the tank, depending how long it takes for your aquarium to experience one complete cycle.

Only when nitrate readings are as close to zero as possible is it safe to introduce your fish to their new home. There are a couple of different ways to do this but only one safe way.

Because the bag water contains its own environment of potentially contaminated parasites, you don't want to chance this water cross-contaminating your tank. So, the safest way to introduce fish via water exchange is to put the bag of new fish in a separate 'holding' bucket and replace 25% of the bag water with tank water. Continue adding small amounts of tank water every ten minutes for an hour (the overflow spilling into the clean holding bucket). Once the fish are acclimated, use a net to move the fish from the holding bucket to their new home.

Only add one or two fish at a time to give your filtration system the time needed to take on the increased biological load of the new fish.

Don't feed your fish on the first day (they probably won't eat now anyway). Let them get acquainted with their new home.

You should also consider quarantining new fish (in a separate tank) for a week or more to make sure they're not ill. Of course, this step isn't necessary when they are the very first fish for your aquarium.

## Caring For Your Fish

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Once your tank has been set up and your fish have been introduced to it, they'll require care. Many people think of taking care of fish as dropping a few flakes in every day and then forgetting about them but that's not at all how it works. Fish require about as much care as a cat does.

As far as food goes, there are many different options available, flakes and pellets being the most common. Be sure to use pellets of an appropriate size to prevent choking, or other intestinal problems. Flakes are cheap but are primarily filler. If you're looking for high quality food, your best bet is probably frozen and freeze-dried foods. Like humans, a varied diet provides a wide array of essential nutrients. A healthy fish is a happy fish!

And be especially careful not to overfeed your fish. Not only can overfeeding cause your fish to grow fat but uneaten food sinks to the bottom of the tank and adds to the aquarium's waste volume.

The best way to feed your fish is to provide one piece of food for each fish twice a day. As long as each of the fish gets a piece most of the time, they'll be fine. In fact, it's actually beneficial for fish to occasionally fast for a day or two.

## Maintenance Schedule

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The best formula for successful fish keeping is to keep a regular maintenance schedule...

### DAILY

- Feed fish (2x/day)
- Check all fish for disease, liveliness and normal behaviour
- Check temperature and make sure pumps, filters and lights are running smoothly
- Remove any debris (eg. large particles, uneaten food, etc)

### WEEKLY

- Partial water change (Remove waste and siphon off water)
- Clean tank (inside and out)
- Clean fluorescent tubes and fixtures
- Clean inner and outer glass surfaces with specially designed algae scrapers

### MONTHLY

- Maintain filter
- Check your supplies (eg. food, water conditioners, media, etc)

### YEARLY

- Replace lamps
- Change fluorescent bulbs

## **10 Basic Rules For A Successful Aquarium**

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1. Provide regular, healthy feeding (2-3x / day)
2. Keep fish populations within tolerable limits
3. Follow a daily, weekly, monthly and yearly checklist
4. Choose fish that are compatible
5. Don't skimp on your filtration system
6. Use living plants where possible
7. Choose the largest aquarium your budget and space will allow
8. Keep environment stable and well-conditioned
9. Plan your aquarium (Do NOT rush the early stages)
10. Enjoy your aquarium

## **10 Things To Consider BEFORE You Buy Your Aquarium**

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1. Decide on the type of fish / environment you want
2. Research care and compatibility of you fish
3. Determine space
4. Determine budget
5. Select equipment
6. Evaluate budget / space constraints
7. Purchase equipment
8. Setup equipment
9. Cycle your tank
10. Maintain your tank