

Maximum Recommended Fish per Tank

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| 1 - Gallon Fish Bowl | 3 Goldfish |
| | or 6-8 Guppies |
| | + 1 Algae Eater |
| 5 - Gallon Aquarium | 6 Medium Fish (Tetras, Goldfish, Mollies) |
| | or 12 Small Fish (Guppies) |
| | + 1 Algae Eater |
| 10 - Gallon Aquarium | 15 Small and Medium Fish |
| | + 1 Algae Eater |
| 20 - Gallon Aquarium | 20-25 Small and Medium Fish |
| | + 2 Algae Eater |

Selecting Fish for the Classroom:

Many fish species can be kept in the classroom. Determining which to keep depends on several factors. First, it should be noted that every state has laws protecting most native fish. Therefore, before collecting any native fish, consult your state's wildlife agency. Pet stores are a more typical source of aquarium fish, and they usually offer a wide selection, including both freshwater and marine species. While virtually most pet store fish can be kept under classroom conditions, some require sophisticated equipment, specialized food and considerably more care than others. The salesperson might be able to make recommendations and answer any questions. However, unless you have experience in keeping fish, it is recommended that species that are noted for ease of care and hardiness be selected. Probably the easiest and most commonly kept aquarium fish are goldfish and guppies. Both are especially tolerant of classroom conditions and are recommended as first for the fish inexperienced aquarist.

Goldfish in the Classroom:

Because they are hardy and easy to care for, goldfish are ideal first fish for the inexperienced aquarist and are excellent for the classroom aquarium. Since they are available in a variety of colors and forms, it is possible to maintain an interesting mixed aquarium without the additional equipment and care required for the more exotic tropical fish.

Caring for Goldfish**Housing:**

A standard aquarium setup is a practical and suitable container for goldfish. The number of fishes that can be kept is largely a function of their size. Normally, about one inch of fish (excluding the tail) can be kept for each gallon of water. In using this formula, figure the actual amount of water, not the volume of the container. Keep in mind that a portion of the space is taken up by gravel and the water level does not reach the top. With this in mind, a 5-gallon aquarium is suitable for 3-4 inches goldfish and a 10-gallon aquarium can accommodate 6-8 inches of goldfish.

First you should purchase an aquarium. One can be purchased from any place that sells fish supplies. They can range from many styles and sizes, varying in price. Buy as large a one as you have room for, and as good a one as you can afford, for the more space that is given to the fish, the more will be the enjoyment of watching their constant movement, the greater will be the opportunity for artistic planting. Having bought an aquarium, fill it and let the water stand for a few days to be sure the tank does not leak. (If it does, there is cement silicone for aquariums sold for the purpose of patching up small leaks. Sometimes just carrying the tank home from the store will loosen a joint of glass and metal and it must be repaired before the tank can be used.) Then siphon off the water, be sure the aquarium is perfectly clean, and you are ready to go to work.

The first step is usually to put gravel in the bottom of the aquarium. Coarse, light-colored gravel is generally used, and may be bought from almost any place that sells fish supplies. If you collect the gravel yourself, be sure to wash it well in running water to remove any impurities it might have before you put it in the aquarium. Then cover the bottom of the tank with gravel to a depth of between one and two inches, pour in three to four inches of water, and let the gravel settle and the water clear before you do any planting.

Some aquatic plants need more nourishment than is furnished by the gravel and the fish, and therefore a layer of soil is sometimes put in the tank and then covered with gravel. This arrangement has its disadvantages; one of them being that certain fish burrow about in the gravel, and if they stir up mud underneath it the clarity of the water is destroyed. It is much better to set the plants that need humus in a small pot, which has a layer of earth, a layer of gravel and fine pebbles over the top to prevent the subsoil from being disturbed.

Elodea, Vallisneria and Cabomba are among the rooted varieties of water plants. To set the plants, spread the roots carefully apart and cover them with gravel. Sometimes they need to be weighted with a small stone to keep them in place until they commence to grow. The lead weight often found on bunches of plants bought from dealers should always be removed. Only the actual roots should be covered, the crown remaining clear of the gravel. If the plants are set in place before the aquarium is filled to the top, it would be easier to anchor them, not only because they are easier to reach, but because there is less tendency for them to float to the top.

Once they are set in place, fill the aquarium. The simplest way to do this without having the stream of water that is poured in stir up the gravel and uproot the plants, is to put a piece of newspaper in and pour the water gently onto that. The paper is strong enough to break the force of the stream of water and protect the planting. Again, the aquarium should be allowed to stand for 48 hours before the fish are put in, so that the water may attain room-temperature and so that harmful gases in it (chlorine, for instance, in some city water) may dissipate.

After the fish are placed in the aquarium it should be covered with a sheet of glass or with one of the roof-like lids used when an electric light is installed over the tank. This is for various reasons: it prevents the fish from jumping out, keeps out dust, lessens evaporation and helps to keep a more even temperature in the water. The fish are in no danger of smothering when kept covered. The daily removal of the cover for feeding allows enough fresh air to enter to take care of surface absorption, and of course the plants supply much of the needed oxygen.

A great way to refill aquarium as needed is to have an "open" jug of water on hand. An open jug left for 48 hours will give it time to dechlorinate and will make it safe for your classroom fish.

Diet:

Commercial goldfish food will provide a satisfactory diet, but this can be supplemented with small amounts of natural food such as insect larvae and worms. Goldfish will also nibble at aquatic plants, and if snails are kept in the aquarium, the goldfish will probably consume some of the eggs and young snails. Goldfish do best when fed small amounts on a daily-basis when it is convenient, but they can also be left without being fed over weekends and short vacations. In any case, they should be fed only what they will consume in a few minutes. When away for long weekends or long vacations, feeder blocks can be tossed into the bottom of the tank for the fish to nibble on (these can be purchased where fish supplies are sold).

Fishes, Native Species

A good rule to follow when caring for fishes is never to overfeed them because leftover food fouls the water, promotes growth of algae, and finally, may cause the death of the fishes. Feed the fish small amounts, which they can consume in three to five minutes and feed them daily. There is no need to feed fish unusually large quantities on Friday, so that they will have food over the weekend. There is sufficient food in a balanced aquarium to keep fish healthy even though not fed for a day or more. Different species require different foods. The best type of diet for most fishes is one alternating living with prepared foods. It is sometimes difficult to obtain a supply of live food at all seasons of the year, especially in the winter; but a culture of Enchytrae (White worms) can be kept for that purpose.

Some of the dried foods that fishes enjoy are bread crumbs, shredded shrimp, oatmeal, egg yolk, and prepared fish foods such as natural fish food, dried Daphnia, earthworms, Enchytrae, Tubifex, mosquito larvae, young snails, baby fishes and brine shrimp larvae are common live fish foods. Other foods, which may be used to vary the diet, are chopped oysters, clams, shredded beef, canned lobster or shrimp.

Fishes, Warm-Water Species (Tropical)

The live-bearing species of warm-water fishes are predominantly omnivorous and their diet should consist of both plant and animal foods, such as Daphnia, chopped earthworms, shredded shrimp, brine shrimp larvae, and crushed spinach and lettuce leaves. The egg-laying species of warm-water fishes prefer live foods to prepared foods.

The success in raising fish from egg to adult depends upon the care of the young. The young of live-bearing species are of a good size when born and are easily reared if fed on finely powdered fish food larvae of the brine shrimp, and sifted Daphnia. Overcrowding of young in a small tank slows up the growth of the entire group. The first few days after hatching, the young of egg-laying fishes are sustained by the remaining food in the yolk sac. After this is absorbed, the young are still so small that they will starve if fed the ordinary prepared or live foods. To overcome this, feeding of Infusoria such as Paramecium and Euglena are offered until they can take larger live and prepared foods.

Breeding Goldfish:

The conditions in an aquarium are not conducive to breeding goldfish. They might occasionally lay eggs, but in the confines of an aquarium, they are likely to find and consume all of the eggs or young. Conditions that favor reproduction in a fishpond include lots of vegetation where the eggs can be laid but not found and consumed.

Guppies in the Classroom:

Guppies are excellent fish for classroom aquarium. Compared with most other tropical fish, they are hardy and the fact that they bear live young and will reproduce in captivity makes them especially interesting to study. They are easy to care for and can be left for weekends and vacations without special care.

Caring for Guppies**Housing:**

A standard 5- or 10-gallon aquarium is suitable for several pairs of guppies. A single pair can also be kept on a long-term basis in a gallon jar. Since there is potential for overcrowding, it is good to limit the number of adults to one pair per gallon of water. The aquarium should be located where it will receive enough light for the plants, but direct sunlight should be avoided.

Guppies are more tolerant of temperature fluctuations than most other tropical fish. They can tolerate water temperatures of 65° to 85° F, but temperatures of 70° to 75° F are best. If the temperature is likely to get below 65° F overnight or on weekends or if rapid fluctuations are expected, an aquarium heater should be used.

Diet:

Dry commercial fish food will provide a satisfactory diet, but this can be supplemented occasionally with finely chopped fish or earthworms. Guppies will also actively consume tiny aquatic organisms, such as daphnia (collected from a marsh or swamp by sweeping an aquatic dip net through the water). Normally, guppies should be fed once each day, but only the amount they will consume in a few minutes. Although they can be left over weekends without feeding arrangements should be made to feed the guppies over vacations. Feeder blocks can be tossed into the tank for the fish to nibble on (these can be purchased where fish supplies are sold).

Breeding Guppies:

If guppies are kept in a healthy environment, no special care is needed to encourage them to reproduce. Shortly after mating, the dark gravid spot on the female's abdomen becomes larger, due to stretching. By the time the female is ready to give birth, the gravid spot is quite large. The gestation period is about 28 days if the water temperature is 76°- 78° F, but it will be longer if the temperature is lower or allowed to fluctuate. Since adult guppies, normally consume some of the young, the female can be placed in a "nursery" aquarium (a gallon jar) when she is about to give birth. Most of the young guppies will be saved if the nursery contains several pieces of vegetation for hiding places and if the female is soon returned to her tank.

The young will not eat for a few days but will later feed on microscopic organisms, that normally live in aquariums and are associated with the aquatic vegetation. After about a week, the young guppies can be fed the same food as the adults. The young can be kept in the nursery for three to four weeks, but as they grow, the litter should be divided and transferred to other aquariums or jars to prevent crowding. By this time, they can also be safely returned to the home tank without fear of their being consumed by the adults.

Observations, Activities and Questions:

- Observe and describe a goldfish. How many fins does it have? How does it use the different fins when swimming forward? Backward? When turning?
- Observe and record the activities or movements of a goldfish in a five-or ten-minute period. Does it swim near the bottom of the aquarium? Does it swim near the surface? Does it investigate (nibble at) plants, snails or other objects?
- How do two or more goldfish interact with each other?
- Gently place a new (inanimate) object, such as a colored marble, in the aquarium. How do the goldfish react to it? After the goldfish are familiar with it, place a similar object of a different color in the aquarium. How do the goldfish react to the new object? Can goldfish perceive color?
- Find out the breathing rate of a goldfish by counting the number of gill movements per minute.
- Observe and describe a male and female guppy. How are they alike? How are they different? How many fins do each have? How do the fins on a male and female guppy differ?
- If daphnia or some other tiny pond organisms are available, introduce a few into the guppy aquarium.