# fish

In Australia, the common names for particular fish species vary among the states or even among between different parts of the same state. For this reason, it is advisable to use scientific names.

Keys and descriptions of species can be obtained from scientific publications. There is ample material about Australian marine and freshwater fish available and the fish department of the Australian Museum can be contacted for more information about identification.

As there are many varieties of fish, the information published here is confined to general terms only.

Numerous species, both native and exotic, are available commercially. It is very easy to keep fish in an aquarium in the classroom. As an educational tool, aquaria can be used to study the habitats of fish and their reproductive and other behaviour. With a small breeding tank, for example, students can watch the spawning, hatching and development of fish.

In a school environment, it is much easier to keep and maintain freshwater tanks than saltwater tanks. Where different species are kept in a common environment, consideration must be given to compatibility.

It is also important to note that, as some fish grow, they may bully smaller individuals, even of the same species. When choosing which fish to use, your capacity to maintain and care for the fish should also be considered. Thought must be given to their care during school holidays and arrangements must be made for appropriate maintenance of the aquarium during these

## Varietal range difference

There are some 25,000 species of fish, divided into three groups: jawless, cartilaginous and bony. Many of these are suitable for school aquaria.

## physical characteristics

* **Size:** the size of a fish will be determined by factors such as its species, the size of the aquarium, the number of other fish in the aquarium and availability of food
* **Weight:** in an aquarium, 2g - 250g
* **Average life span:** varies with species
* **Range of breeding ages:** adulthood varies with the species, spawning continues from adulthood to death
* **Temperature:** fish are poikilothermic (cold blooded), so their body temperatures are determined by their environments. Consult reference material for the physical attributes of specific species.

## environment

The least complicated environment is a natural pond in the school grounds. If this is not possible, an aquarium in the classroom is relatively simple to maintain. The tank needs to be kept at room temperature and should not be exposed to direct sunlight, as the sunlight will overheat the water and cause a rapid growth of algae. It should include plants and invertebrates, and be allowed to stabilise for one to two weeks before the fish are added.

Filtration and aeration can be added to facilitate fish survival but each addition of physical support to the tank increases the probability of the system breaking down. It also adds to the amount of monitoring required.

If tropical fish are to be kept, a heating and temperature control system must be used.

With a saltwater tank, the system becomes even more complex and is not recommended unless you have prior experience and success in another context such as at home.

The following are general rules for preparing freshwater aquaria suitable for tropical and temperate fish species, including Australian native fish.

Aquariums should try to replicate the natural environment of the fish they contain.

For the first filling, tap water must be left to age in the tank for 24 hours before introducing plants or fish. Important factors to be monitored are the water pH, dissolved oxygen and hardness. The recommended levels for temperatures of 20C - 25C are pH 6.5 - 8, oxygen level not less than 5ppm and total hardness about 100ppm. Washed river gravel is ideal as bedding. The bottom of the tank should be covered to an average of 75mm.

Filtration has a very significant effect on water quality and fish health. The three types of filtration are mechanical, biological and chemical, of which mechanical is the most popular and easiest to use.

Water should be changed about at least monthly and preferably weekly. It is important not to replace all the water at once: about a quarter by volume is sufficient. A major cleaning should be undertaken once every three-four months, when the fish are removed, placed in a container with 25 per cent of the original tank water and covered. The walls of the tank must be cleaned carefully, with all chemical residues from the cleaning being rinsed away. Wash sand or gravel thoroughly to remove any accumulated debris. The tank should be two-thirds filled with tap water and allowed to stand for at least half a day before the remaining sand or gravel, water and fish are returned to the tank.

Requirements for breeding tanks vary with each species. Separate tanks may be required.

The size of aquariums depends on the size of the fish. The formula for determining the maximum carrying capacity provides for around 15mm of length of a fish per 4.5L of water. More space is required if the tank is not ventilated. One or two small air stones, connected to an aerator, must be used for a 35L - 70L tank. More should be used for bigger tanks. The water surface should be monitored for the presence of oily scum, as this will interfere with gas exchange.

In the school context, the use of suitable covers is essential for all aquaria. They prevent fish from jumping out and dust and toxins (such as insect sprays) from entering the tank. A glass or other solid cover should only be used if the tank is ventilated.

For an unventilated tank, it may be necessary to make a frame and cover from suitable mesh. Appropriate care must be taken whenever insect spray is used. An additional cover, such as a towel, should be left in place for six hours after spraying the room.

For most tropical and temperate fish, a water temperature range of 22C - 25C is adequate. An aquarium heater may be used to control the temperature.

Aquariums should not be exposed to direct sunlight, as it will overheat the water and cause algae to grow rapidly. Diffused, filtered natural light can be used. Artificial lighting is usually by fluorescent tubes controlled by timers. Lights must not be suddenly turned on and off because some fish may become very nervous and move erratically around the tank. A dimmer light switch will avoid this problem. The correct lighting is very important for aquarium plants. In a new aquarium, 12 hours of artificial lighting each day should be enough for most aquatic plants. The exposure time may be increased or decreased until a good plant growth rate is achieved.

## FOOD REQUIREMENTS

Manufactured fish foods can be fed to tropical and temperate fish. Other types of foods – for example, frozen food mixtures, prawns, brine shrimp and mosquito larvae – may also be given. However, unless expert advice to the contrary is available, commercially-available foods are preferred.

The quantity of food depends on the type, age and number of fish in the tank. As a general rule, sufficient to be eaten within a few minutes should be given. Overfeeding can cause health problems and result in uneaten food decomposing and causing pollution of the water, resulting in fish illness and death.

Daily feeding is usually sufficient and never more than twice a day.

## NORMAL BEHAVIOUR

Varies with species and therefore other references must be consulted for information about the type of fish you intend to keep. Incompatible fish species may eat others and some fish species are very aggressive.

## SIGNS OF ILLNESS

Signs of illness include skin lesions such as spots, ulcers or growths, floating, listing and swimming upside down. Seek advice from veterinarians familiar with fish diseases.

## HANDLING

Fish should not be handled. A small aquarium net can be used to capture them.

## EUTHANASIA

In the case of a fish becoming so sick, diseased or injured that recovery is unlikely or undesirable, on humane grounds euthanasia must be arranged with a veterinarian or a person competent in the technique for fish.

A record of deaths is required for the annual report to VSAEC.

## FATE PLANNING

A fate plan should be considered before using fish in any program. Fish that are no longer required must be re-homed.

Fish should not be released into natural waterways.

## MORE INFORMATION

* [Department of Primary Industries: Fisheries and Aquaculture](http://agriculture.vic.gov.au/fisheries/aquaculture)
* [Fisheries and Aquaculture – Australian Government portal](http://www.agriculture.gov.au/)
* [University of Sydney (Faculty of Veterinary Science)](http://sydney.edu.au/vetscience/)
* Guide to Fish, Grant E.M. (1982), (5th edn), Queensland: Department of Harbours and Marine, Brisbane
* Australian Native Fish for Aquariums, Leggett R. and Merrick J.R. (1996), J.R. Merrick, Sydney
* Freshwater Fishes of South-Eastern Australia, McDowall, R.M. (ed) (1996), (2nd edn), Reed Books, Victoria: Port Melbourne

Kindly sourced from the [SAEC – Schools Animal Ethics Committee of Western Australia](http://www.det.wa.edu.au/curriculumsupport/animalethics/detcms/portal/)