

Budget clownfish set-up



Set up this simple, low budget aquarium and wet your toes in saltwater.

James Starr-Marshall explains how he put together a simple clownfish aquarium for his son.

I recently watched the computer animated film *Finding Nemo* with my two-year-old. As I am a fan of both Pixar studios and fishkeeping it is one of my all time favourites and I could not wait to share it with my son. I was delighted that he also seemed to love the film as it made him laugh, gasp and occasionally jump from his seat with an incomprehensible outburst.

What I had underestimated however, was his appreciation of the concept that it is possible to keep a 'Nemo' in an aquarium, and it wasn't long before he pointed at his guppy tank repeating the word Nemo over and over. This reminded me of the phenomenon that occurred at the film's release in 2003 when parents found themselves being dragged into aquarium shops by children with a burning desire to keep a clownfish as a pet. There were, of course, people who wrongly expected to buy an inexpensive tank and a clownfish that day, take it home and have it live happily ever after. But there were also those who took the advice of the shop staff, did their

background reading, set up appropriate tanks well in advance of purchasing tank bred clownfish and used the project to educate their children about the biodiversity of coral reefs.

Amphiprion ocellaris is the real world fish that bears the greatest similarity to Nemo. It is a relatively small fish that rarely grows larger than 10cm/4in and occupies a small territory around an anemone in the wild, although it will happily live without one in the aquarium. It is hardy, and this is particularly true of the widely available tank bred specimens.

So I decided to investigate what the minimum set-up would need to keep a pair of Common clownfish happy.

The smallest aquarium should ideally hold 100l/22 gal and if you are looking for one that has the least impact with respect to footprint a cube shaped tank is best. For fish that require linear swimming space cubic aquariums are not the best option but as clownfish naturally utilise the space around their host anemone or other chosen

territory, they are more appropriate here.

My tank was a 46cm/18in cube made from 10mm thick glass for child safety, and although it is 3l shy of the ideal minimum it will suffice as long no other fish are added beyond the two clownfish and water conditions are kept good as well as stable.

TIP LED lighting is undoubtedly the best choice for an aquarium of this type. Its low voltage and robust build makes it child safe and it does not give off much heat which is of great benefit if you think you might want to keep corals in the future. If you are planning on upgrading to a nano reef in the future, it is worth an initial investment in the high intensity lighting that corals require. It will be cheaper in the long run to buy bright lights and dim them down to avoid algae whilst you have a fish only system.

SHOPPING LIST

Option 1 assumes you don't want corals and that you will buy premixed seawater from an aquatic shop. You may need to add an RO system and salt to this list if you can't buy seawater easily this way. Option 2 gives you the choice to add corals at a later date.

If you're converting a freshwater set-up to saltwater, then items denoted by * can be re-used, with a potential total saving of over £210.

Option 1: Fish only

- *46cm cube aquarium: £110
 - *46cm aquarium hood: £45
 - *EHEIM Pickup 45 internal filter or equivalent: £19.99
 - *TMC V²Therm 100 heater or equivalent: £35.99
 - TMC V²Skim nano 120 skimmer: £52.99
 - TMC V²Powerflow 2000 powerhead: £29.99
 - 10–12kg red lava rock: £25
 - Caribsea Arag-Alive 20lb live sand: £24.95
 - TMC Aquabar T series (380mm): £34.99 + £23.99 power supply unit
 - TMC H² fill and go 20 l water container: £8.49
 - Instant Ocean hydrometer: £11.99
 - Seachem Marine buffer: £11.99
 - ATM Colony Bacteria Saltwater 118ml: £10.00
 - Salifert pH test kit: £7.99
 - Salifert Ammonia test kit: £9.99
 - Salifert Nitrite test kit: £8.99
 - Salifert Nitrate test kit: £10.99
 - Salifert dKH test kit: £8.99
 - Salifert Phosphate test kit: £10.99
- Total: £492.31

Option 2: Reef ready

- *46cm cube aquarium: £110
 - *46cm aquarium hood: £45
 - *EHEIM Pickup 45 internal filter or equivalent: £19.99
 - *TMC V² Therm 100 heater or equivalent: £35.99
 - TMC Reefskim 100 skimmer: £89.99
 - TMC V² Powerflow 2000 powerhead: £29.99
 - 10–12kg red lava rock: £25
 - Caribsea Arag-Alive 20lb live sand: £24.95
 - TMC Aquaray 1500 Tile marine white: £139.99
 - TMC V²Pure 50 RO system: £89.99
 - TMC H² fill and go 20 l water container: £8.49
 - Tropic Marin Pro Reef salt 10Kg: £32.49
 - TMC V² refractometer: £39.99
 - Seachem Marine buffer: £11.99
 - ATM Colony Bacteria Saltwater 118ml: £10.00
 - Salifert pH test kit: £7.99
 - Salifert Ammonia test kit: £9.99
 - Salifert Nitrite test kit: £8.99
 - Salifert Nitrate test kit: £10.99
 - Salifert dKH test kit: £8.99
 - Salifert Phosphate test kit: £10.99
- Total: £771.79 All prices are approximate



The tank bred Common clowns have settled in very well.

Filtration

A protein skimmer is capable of removing up to 80% of dissolved organic waste from the marine aquarium before it enters the nitrogen cycle, meaning less nitrate is produced. Marine fish are generally more sensitive to nitrate than freshwater varieties so it is always worth using a protein skimmer. It is also, therefore, worth giving consideration to biological denitrification particularly if you want to keep corals at some point. Most fishkeepers are well aware of nitrification where organic waste is converted to ammonia then nitrite and finally nitrate by bacteria that operate in oxygenated conditions. In de-oxygenated conditions bacteria can sometimes use the oxygen that is part of the nitrate itself and eventually break it down into its constituent elements.

To provide nitrification and denitrification marine fishkeepers often opt to forego external biological filtration and instead use a combination of live rock and very good water circulation within the aquarium.

Lava rock — or not?

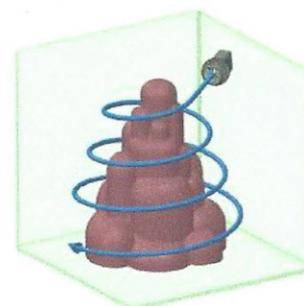
As live rock can be expensive and I wanted this project to be accessible to people with limited budgets I chose to use lava rock instead. The use of lava rock in marine tanks is a slightly controversial subject as some believe it contains metals that can be harmful to fish and more so to corals. To be honest it may well contain iron but then so does your aquarium glass and that doesn't leech into the water. From personal experience I know many aquarists, myself included, have used red lava rock in their reef tanks for years and none

of us have had any problems.

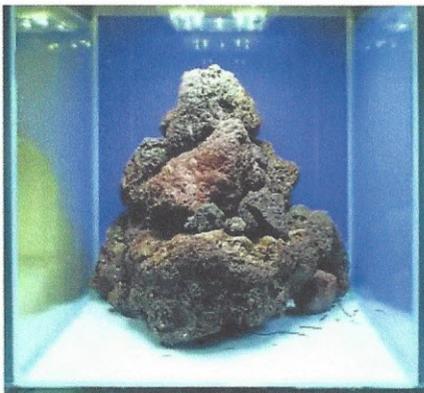
The idea is that in the outside layer of this porous rock, where the water is rich in oxygen, aerobic bacteria will form and turn waste into nitrate. Deeper inside the rock, where water movement is slower and the bacteria in the outside layer have used up the oxygen, anaerobic bacteria will form and denitrification should occur.

Some mechanical and chemical filtration is also advised to catch particulates and inorganic pollutants. A small internal filter containing wool and activated carbon will be adequate.

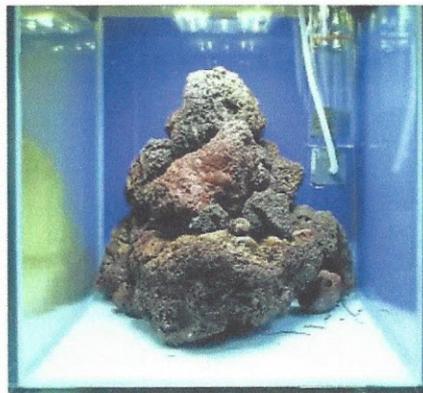
TIP The large mesh aperture on the TMC circulation pump gives ideal turbulent water movement with a wide spread angle. Position the pump near the top of the tank as oxygen is in higher concentration here. Angle it down and across the rock to try and create the helical water movement depicted above. Now oxygenated water should circulate the rocks and encourage aerobic bacterial growth.



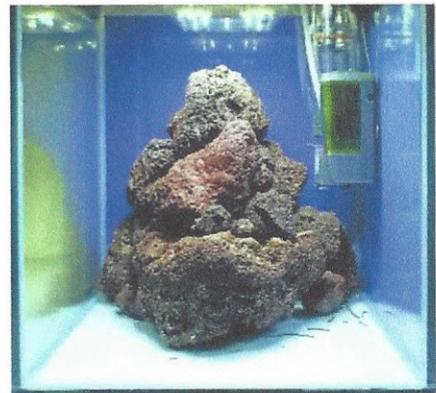
Setting up the aquarium



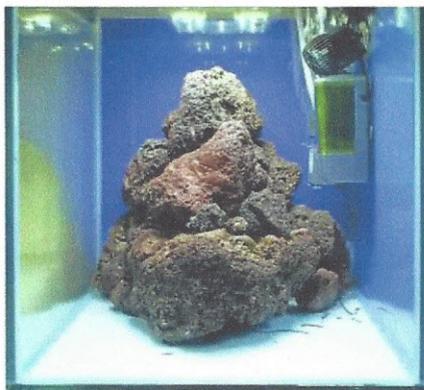
1 The lava rock will form the bio filter and is essential to keep the clownfish healthy. Use lightweight porous rocks of various sizes to encourage both aerobic and anaerobic bacteria. Piling the rocks centrally allows for better water circulation.



2 Check there is space for the equipment but do not arrange the rocks with it in place in case of breakages. Position the protein skimmer as per its instructions — you may have to amend the aquarium hood to accommodate the skimmer cup.



3 The internal filter is placed next to the skimmer. The standard sponge media has been replaced with a carbon sponge and some filter wool. The outlet nozzle direction can be adjusted to help get the ideal circulation.



4 The circulation pump is the second part of the bio filter and as such is very important. The pump must turn the tank over at least 20 times an hour for the bio filter to work. Its position and direction are also important (see Tip on the left).



5 The last piece of hardware to be added is the heater. As there is plenty of water movement it can be placed upright to save on space. Position it so that the thermometer display can be easily read.



6 The live sand can be carefully poured onto the base of the tank. This is added last to stop it drying out. The tank can now be filled with saltwater.

Making water

Whether you decide to install a reverse osmosis (RO) system and make your own seawater or purchase it from a shop, you are going to need some understanding of its parameters. Put simply, specific gravity or SG is the salt concentration in the water and is best set at 1.025 with modern marine salts. The extent to which this changes in the aquarium will be largely due to evaporation rates and you may notice the SG rise throughout the week if you lose a lot of water this way. In this case you will need to top up the tank with RO water, so if you buy your seawater you will also need to purchase a small quantity of unsalted RO (don't use tapwater, as it can be very detrimental to stability). SG can be measured adequately with a swing arm hydrometer though a refractometer will give more accurate results and is advisable if you keep corals. The other two parameters that you will need to consider are pH and carbonate hardness (dKH). I used Seachem liquid marine buffer to raise dKH to 11 at which point the pH was 8.1. Don't worry too much if you can't get the exact figures — an acceptable range is a pH of 7.8–8.4 and dKH of 6–12, as long as they are kept fairly stable.

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System success

It took about four weeks for the tank to cycle and once I was happy that ammonia and nitrite were reading zero I decided to stock the fish. At this point the nitrate was about 25ppm, which is safe for clownfish but I did a 20% water change just to be sure. I also added a 118ml bottle of ATM colony to ensure there were plenty of bacteria to cope with the addition of fish.

Clownfish start their lives gender neutral then become immature males with only one dominant fish in a group becoming female. By purchasing two juvenile clownfish I was assured that one would become dominant and turn into the female without too much squabbling. The fish settled in well and after the three days advised for the ATM colony to settle I switched on the protein skimmer. Do not expect the skimmer to be constantly collecting waste in a lightly stocked fish only system. I set my skimmer up for wet skimming and it produced a light brown liquid which filled 10% of the cup over a four-day period. I emptied and cleaned the cup twice a week and did a 20% water change once a week.

It was about three months after stocking that the anaerobic bacteria became established and the nitrate dropped to a desirable 10ppm where it has settled. For those interested in keeping corals, phosphate had dropped to almost undetectable levels by this stage.

The Common clownfish I bought were tank bred and readily accepted daily feedings of Vitalis extra small marine pellets and freeze dried brine shrimp with a weekly treat of frozen *Mysis*. I feed them three times a day and the use of dry foods allows my two-year-old to be involved in the process, under supervision of course.

I am very pleased that this low budget system works so well and that the fish are thriving. The TMC equipment performs well beyond its very reasonable price and I would recommend that anyone planning a marine project has a good look through their catalogue. The icing on the cake for me, however, is that my son and I have a great time every day watching and feeding the fish, both of whom are apparently called Nemo.