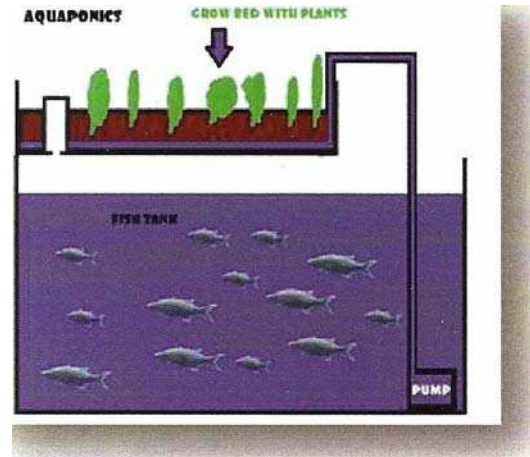


The 1 - 2 - 3 closed system

Fish - Bacteria - Plants

The 1 - 2 - 3 system is a symbiotic system between fish, bacteria and plants. The basic process starts with the fish in the tank producing waste. The fish water is pumped up to the grow bed, where the bacteria transform it into nutrients for the plants. The plants absorb the nutrients and then the clean water is passed back to the fish.



This process is called, *the Nitrogen Cycle*.

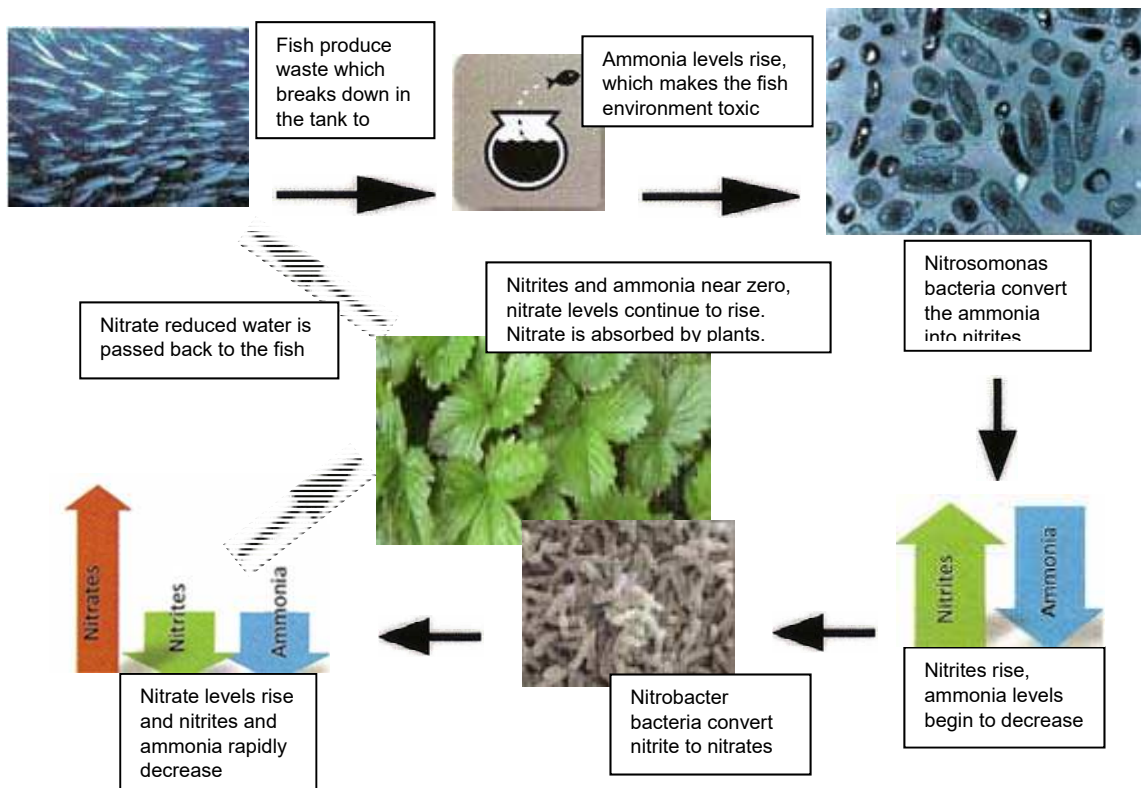


Figure 1: The Nitrogen Cycle

The nitrogen cycle is a continual loop. However, there are many details that need to be maintained to make sure the entire system is balanced. If nitrate levels rise to beyond 100ppm (parts per million) it is dangerous for fish.