

# Ballast and Buoyancy

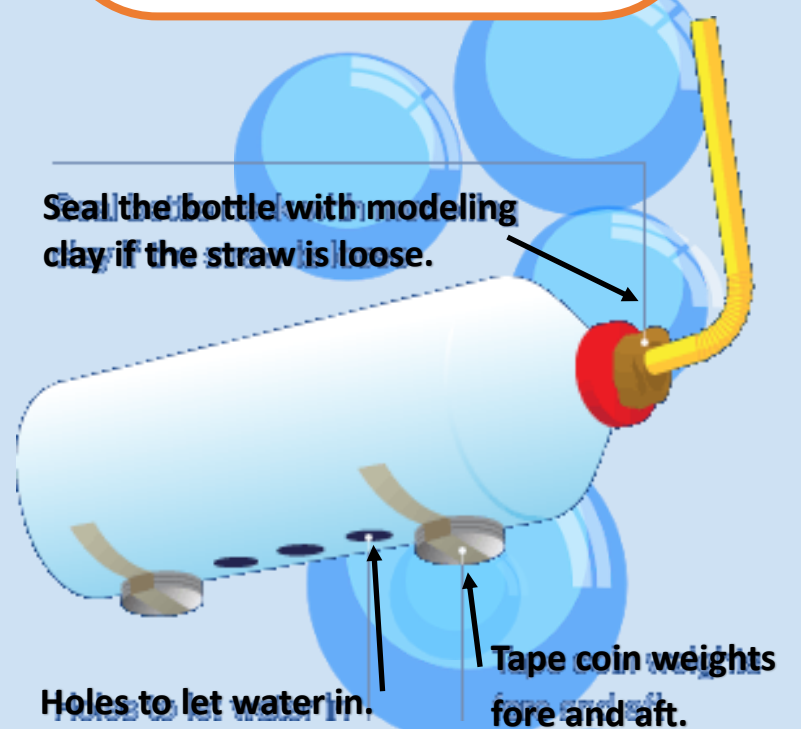
A *ballast tank* is a compartment within a boat, ship or other floating structure that holds water, which is used to provide stability for a vessel. In submersibles and submarines, ballast tanks are used to control buoyancy. Subs and submersibles flood ballast tanks to submerge, then to re-surface either discard ballast weights, or use stored compressed air to blow their ballast tanks clear of water, becoming buoyant again.

## Build Your Own Ballast Tank

1. Ask an adult to make several holes along one side of the bottle, and one hole in the bottle cap.
2. Tape 5 heavy coins to either end of the bottle, in line with the holes. This will add weight to the craft and keep the holes facing the bottom.
3. Attach the flexy straw to the bottle cap, using modelling clay to seal around the base of the straw. To allow the sub to deep dive, add a length of plastic tubing to the end of the straw.
4. Place your ballast tank in a basin of water. Once launched, it will start to sink as water floods through the holes along the bottom.
5. Keep the end of the straw or plastic tube above the waterline at all times.
6. Blow through the tube to fill the ballast tank with air. It will start to rise as the water gets blown out.
7. With practice you will be able to make the tank float at any depth you wish!

## Materials

1L Plastic Bottle  
Scissors  
10 Coins  
Waterproof Tape  
Modeling Clay  
Straw or Plastic Tubing



## What's Happening?

Air is vented through the tube, allowing the submarine to flood with water.



Blowing air into the submarine forces the water out.

