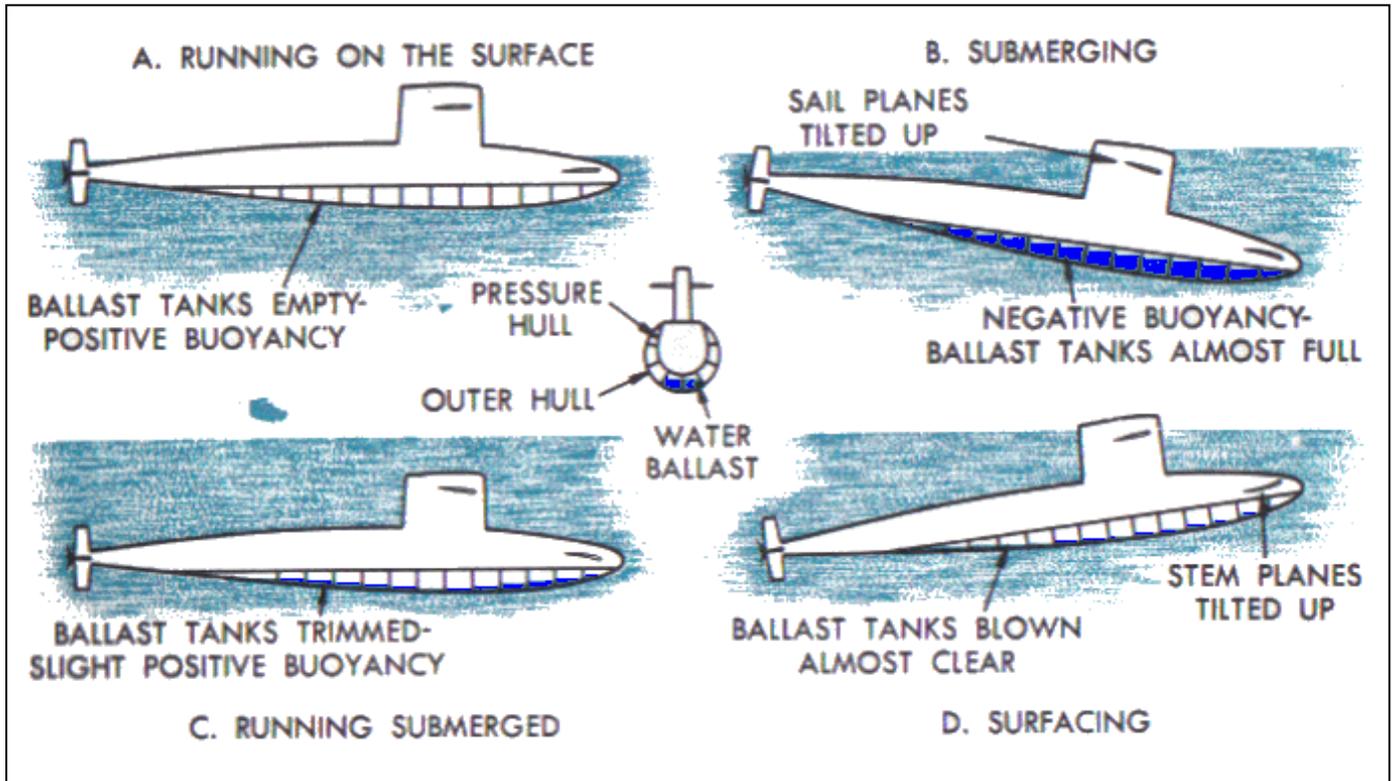
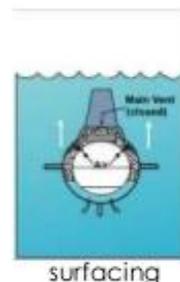
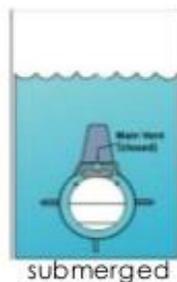
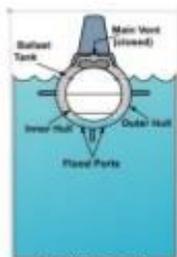


CREATIVE CONNECTIONS

- DENSITY COLUMN** - Many liquids and solids differ in their *densities*. Instill your *creative* abilities and *apply* what you have learned in class by *creating* a Density Column.
 - Do research on the density of liquids and solids and build a **liquid column** that has at least **4 different liquids** in it that **separate into 4 distinct layers** in your column.
 - If you want to challenge yourself even more, do some research on various objects and find **at least two different objects with different densities** that **would float on two different layers** in your Density Liquid Column.
 - Place those objects in your liquid column and make sure they float on different layers.
 - Provide an **answer key** to your Density Column. **Draw your Liquid Column** and **label it** with the following:
 - The name of the liquid layers
 - The name of the objects
 - The density of each liquid layer
 - The density of each object
 - This activity works best (and you use a lot less liquid) if you use a very narrow tube or container such as a medium size test tube or graduated cylinder.
 - Either bring your Density Column to class or take a photo of your column (with you in the picture either standing or sitting next to the column you made). Print your photo and bring it into class with your answer key!
- BUILD A SUBMARINE –** create a submarine that has the ability to first float in water, sink, then float again. You should be able to demonstrate the floating, sinking and floating again within 3 minutes and without having to take your submarine out of the water.
 - Since you are not allowed to remove your submarine from the water to get it to sink and float, you are allowed to attach tubing etc. to your submarine to help in operating it (to get it to sink then float again).
 - Bring your submarine into school. I will allow you to either demonstrate it during class or Smart Block. If you would rather make a video of the operation of your submarine, you are welcome to do that as well.
 - See diagrams on next page to help you understand the operation of a submarine.



How does it work?



- A submarine resting on the surface has **positive buoyancy**, which means it is less dense than the water around it and will float. At this time, the ballast tanks are mainly full of air.
- To submerge, the submarine must have **negative buoyancy**. Vents on top of the ballast tanks are opened. Seawater coming in through the flood ports forces air out the vents, and the submarine begins to sink.
- The submarine ballast tanks now filled with seawater is denser than the surrounding water. The exact depth can be controlled by adjusting the water to air ratio in the ballast tanks. Submerged, the submarine can obtain **neutral buoyancy**. That means the weight of the submarine equals the amount of water it displaces. The submarine will neither rise nor sink in this state.
- To make the submarine rise again, compressed air is simply blown into the tanks forcing the seawater out. The submarine gains **positive buoyancy**, becomes less dense than the water and rises.