

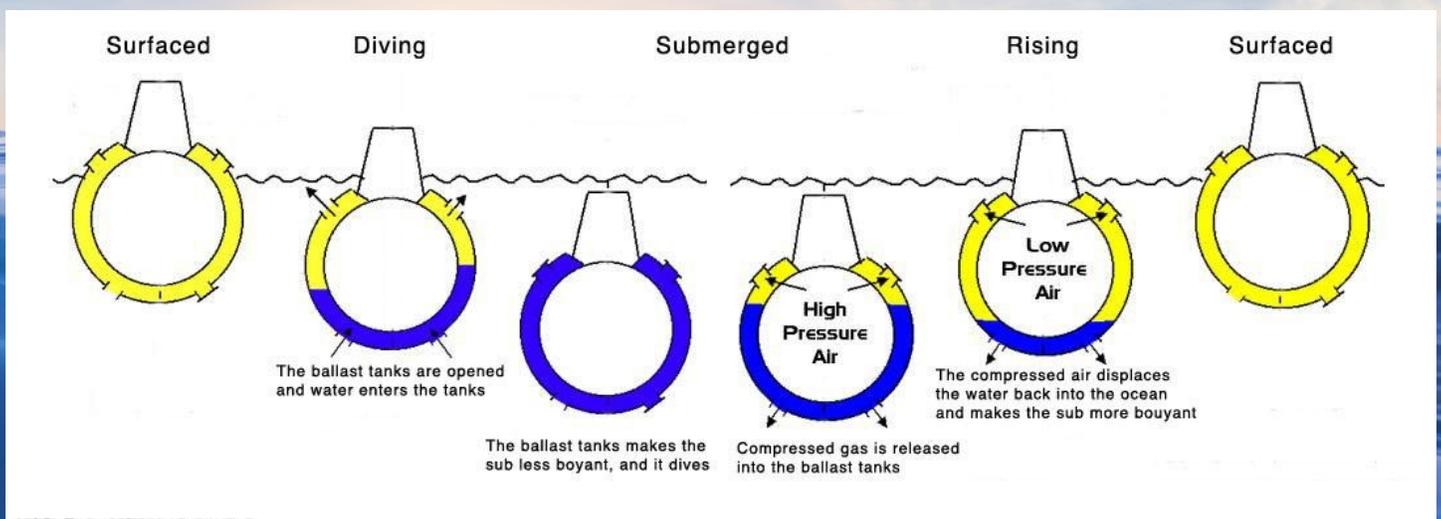
Submarines and Neutral Buoyancy

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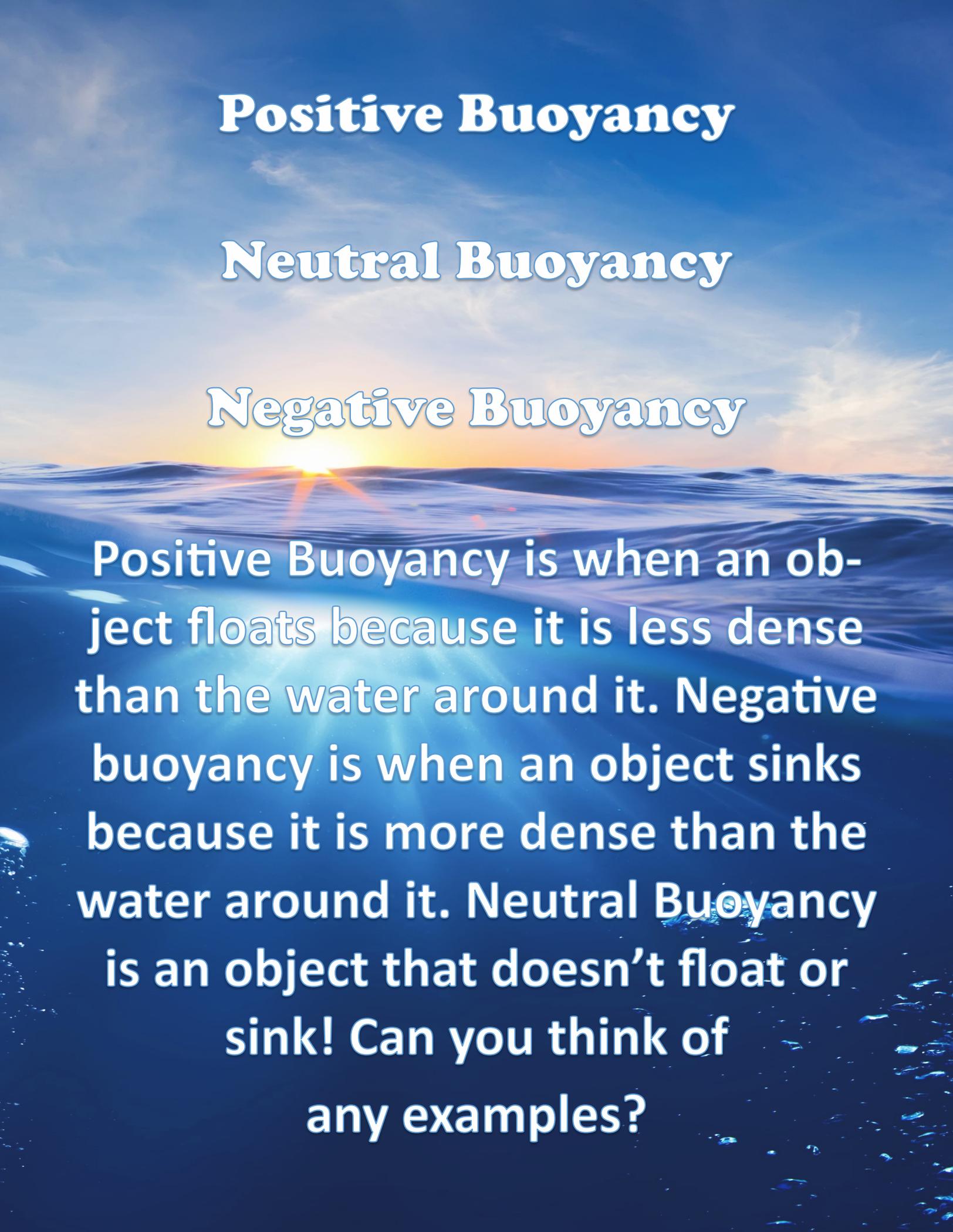
**How are submarines able
to move through the
water at a
steady depth?**

Talk with a neighbor about your thoughts, or turn this page over to learn more!

Submarines and Neutral Buoyancy



It's **Ballast!** Like yellow pool floats for a swimmer's arms- submarines can change the amount of air in their ballast tanks to sink or float at will.



Positive Buoyancy

Neutral Buoyancy

Negative Buoyancy

Positive Buoyancy is when an object floats because it is less dense than the water around it. Negative buoyancy is when an object sinks because it is more dense than the water around it. Neutral Buoyancy is an object that doesn't float or sink! Can you think of any examples?



Positive Buoyancy

Neutral Buoyancy

Negative Buoyancy

Try it out!

Find and squeeze the demonstration bottle to compress the air in the eyedropper.

The harder you squeeze, the more compressed and dense the air becomes! Can you squeeze the bottle to make the eyedropper sink, or just hard enough to achieve neutral buoyancy?

Diving Submarine

Materials you will need:

- 1- 1L bottle with cap
- 1- Pipet
- 1- Washer
- 1- Rubber band
- 3- Strips of Blue paper
- 1- Marker
- Tape and Scissors

*Build Your Own!
Take a picture of both sides,
or ask a museum educator
for a printout*

Step 1:

Slide the washer onto the stem of the pipet, and wrap the rubber band just below the washer to keep it from falling off.

Step 2:

From a water source, fill the pipet so that the bulb at the top is about 2/3 full of water.

Step 3:

From a water source, fill your 1L bottle to the top, drop in the pipet (bulb up) and seal on the cap.

(Once sealed, squeeze the bottle to ensure the pipet can float and sink- if not, you may have to adjust your water levels)

Step 4:

On the first strip of paper write "Denser than Water" and attach it by wrapping it around the bottom of the bottle and securing it with tape. The second strip should say "Neutral Buoyancy" and be attached in the middle, and the third strip should say "Less Dense than Water" and be attached at the top.

Step 5 (Optional):

You can use scraps of paper to create seaweed and fish. By taping these to the back of the bottle (the other side of your writing) you will create an ocean environment for your submarine to dive through!

