

Create an ocean in your test tube

The driving force for all moving fluids in weather systems and climates is heat. Circulating air currents, prevailing winds, the water cycle, and even ocean currents involve movements of air and water when they are heated by sunlight. Warm air is less dense (lighter), and rises in cold air. This principle is what allows hot air balloons to float high up into the sky and is also what causes circulating air currents and wind. Warm water also floats on cooler water. Sunlight causes warm water lenses to form on the surface of the ocean that create ocean currents and influence weather systems.

What you'll do:

Create a warm and cold water lens in your test tube to model the ocean. Use a pipette to squirt cold (blue) water underneath warm (red) water without letting the waters mix.

What you'll need:

- Test tube
- Pippie pipette
- warm water (room temperature)
- ice cold water
- blue and/or red dye

*If you only have one color of dye you can still do the experiment! Just dye your cold water so students can see if they can keep it below the clear water.

Use a little blue or red dye so you can see your cold and warm water.



This student is experimenting warm and cold water in her test tube.





It takes precision work and a little practice to balance water of different temperatures in a test tube. If you mess up, that's okay—pour out your water and try again!

How do the warm and cold water in your test tube model behave. What does this tell you about the ocean temperature if you were to swim from the surface down to deeper water?

The warm water in my test tube can float on the cold water in my test tube while remaining separate from it. Warm and cold fluids in nature behave in a similar way. Warm water lenses form on ocean surfaces. This model tells me that ocean water on the surface is warmer than water that is deeper. As you swim down in the ocean it gets colder and colder.
