# DOES KETCHUP FLOAT?

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| Buoyancy (how things float or sink) k-6 | Sink or Swim Ketchup & Mayo | 1 Ketchup Packet (get them at fast food places)  
This one packet may last for the entire fair, but get 10 or so, just in case.  
1 Mayo packet  
1 Large disposable cup  
2-2 liter clear, plastic soda bottles with lid, emptied and clean,  
Fill 1 with 1/3 c. kosher salt and water to the very top. Mark it with a Sharpie, “Salt water”  
Fill the other with plain water to the very top.  
*Note: Most ketchup packets I tried sunk, so that’s why we create the salt water alternative, so the packet will float. Use salt water ONLY if the packet doesn’t float.* | **Perform a float test FIRST:** drop a packet of ketchup into the disposable cup. *If it floats*, put it in the bottle of water **without** salt.  
If it doesn’t float, put in in the salt water. Fold the ketchup packet lengthwise and slip into the bottle.  
**Don’t break the packet.**  
Screw lid on bottle tightly. The packet should float.  
Make the ketchup packet float or sink by applying pressure to the bottle. (squeeze the bottle until you see the packet begin to sink)  
Release the bottle slowly and watch the packet float back to the surface.  
**Now try it with the Mayo packet.**  
You can play around with it, and see if you can get the packet to stay in the middle of the bottle! It’s like magic! | Did the Mayo Packet behave the same way as the Ketchup packet? Report your findings. *Do both the packets have the same density?*  
Changing the buoyancy (float-i-ness) of the packet of ketchup/mayo:  
When pressure from the water is applied to the bottle, the tiny amount of air inside the ketchup packet is **compressed**, making the ketchup packet **more dense than the water**. This makes the packet sink. It now has **less buoyancy than the water**.  
When you release the bottle, the air is **de-compressed** inside, and becomes **less dense** than the water, making it float. It is now **more buoyant than the water**.  
MORE: *See below for a more detailed explanation for older kids.* |

Density deals with the amount of mass an object has. Adding salt to the water adjusted the water's density to get the ketchup to float. Sound complicated? It is, but here's the basics on the ketchup demo...there is a little bubble inside of the ketchup packet. As we know...
bubbles float, and the bubble in the ketchup sometimes keeps the heavy packet from sinking. When you squeeze the bottle hard enough, you put pressure on the packet. That causes the bubble to get smaller and the entire packet to become MORE DENSE than the water around it and the packet sinks. When you release the pressure, the bubble expands, making the packet less dense (and more buoyant) and, alas, it floats back up. This demonstration is sometimes known as a CARTESIAN DIVER.