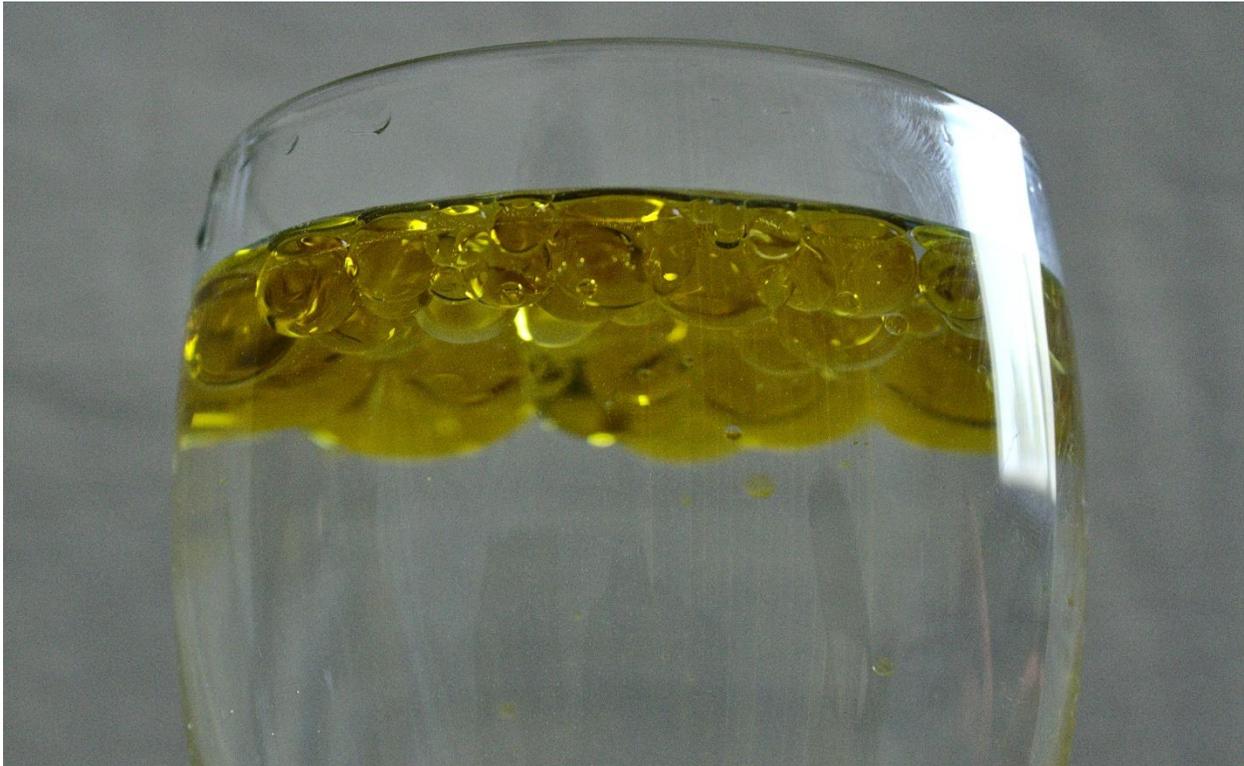


Bradley Busek
Get Wet
September 30, 2018

Get Wet – Oil in Water



For the Get Wet project I decided to start by just dropping different things I found around my apartment into water. This was originally going to be milk droplets being dropped into water and visualizing the milk float down to the bottom. I decided to avoid this because I could not quite get the milk to pop out in the camera as I was limited in lighting. Eventually I decided to get different layers due to buoyancy, starting with water and oil. As I was pouring the oil into the water I noticed it would form into these bubbles and then float to the top of the water. The picture I chose to use is exactly when the bubbles would form at the top and then converge back into a solid layer of oil.

There are a couple of interesting physics concepts behind this picture. The first one describes the formation of the oil bubbles. This is due to oil being hydrophobic, meaning it doesn't react with water. Water molecules have a very strong polar bond with each other, while the oil molecules have nonpolar bonds with each other. The nonpolar bonds of the oil are what makes it not react with the water. The second concept is the idea of density, that is, the mass per unit volume. This concept can be seen in a lot of ways, for instance, a balloon filled with helium is lifted into the sky because helium has a lower density (lower mass per unit volume) than the

air, so the air seems to push the helium upwards. Another instance is simply throwing a rock into a pond, rocks have a much larger density than water, so it sinks quickly. In this case, the oil has lower density than the water, so as it's being poured in, it quickly rises to the top of the glass. Lastly, we notice the formation of the actual bubbles of oil, which is almost a perfect sphere. If an outside force is acting upon another object, the object will try and form a sphere because then the forces are displaced evenly among the surface. The water is pushing against the oil almost completely evenly (the force at the bottom is however larger which is where a teardrop formation occurs) so it forms into a sphere while rising to the top of the water. These concepts are simple but can be displayed in many different forms.

For the creation of this image I used room temperature tap water and Kroger branded Canola Oil. The water was poured into a beer glass and I used a spoon to try and remove any air bubbles along the side of the glass, so my camera would not try and focus on them, distracting from the oil bubble formations. I poured the oil from approximately 4 inches above the top of the water. The bottle was poured at a roughly 30° angle from horizontal to maintain a constant flow out of the bottle. A white t-shirt was placed behind the glass to take away from the distracting background of my apartment. For lighting I had my side windows open to let in natural light, but I had the window behind the camera closed because it was causing too much of a reflection in the glass, taking away from the image. This was shot with a Canon Rebel T5 with a 18-55mm lens, and positioned such that the lens was 5 inches from the glass, creating a frame of 5 in. x 3.5 in. In order to counter the low light of my apartment, the ISO was bumped up to 800 so that the shutter speed could be dropped to 1/125 to allow for a crisper image with no motion blur. The image was still coming in dark, so the aperture was brought down to f/5, with the main focus being on the oil bubbles at the top of the glass. Post processing consisted of slightly increasing the saturation, increasing the contrast, and making the dark aspect of the image closer to a true black. This was done to truly show the distinction between the oil bubbles and make them pop out of the image.

I really like how this image came out despite having lighting issues. The image seems to have some grain in it because the ISO had to be pushed to counter the low lighting. There is also a slight reflection on the right side of the glass due to the open window in my apartment. If I were to redo this image, I would try and allow more natural lighting into my apartment but have this behind the apparatus such that no glare was to be shown on the glass. Despite these issues, I believe the image does a good job of displaying the concepts of density and hydrophobic mixture.