

Stephen Morton
Team First Report
MCEN-5151
March 1, 2018

This photo was taken in an effort to demonstrate the cohesive force and surface tension between the molecules in the shaving cream. Cohesion is an attractive force between the same types of molecules. Adhesion is similar to cohesion except that it is between different types of molecules. Since cohesion is a stronger force than adhesion, there is a net inward force that is essentially surface tension – which causes liquids to try to minimize their surface area. This is also what causes water to fall as raindrops [1]. This experiment was performed by putting a thin layer of shaving cream on a cheese grater, then adding food coloring. The final image in figure 3 below only shows red and yellow, as it was taken from the side. Blue and green were also used on the opposite side of the grate. A thicker layer of shaving cream was then added. The setup can be seen in figure 1 below.

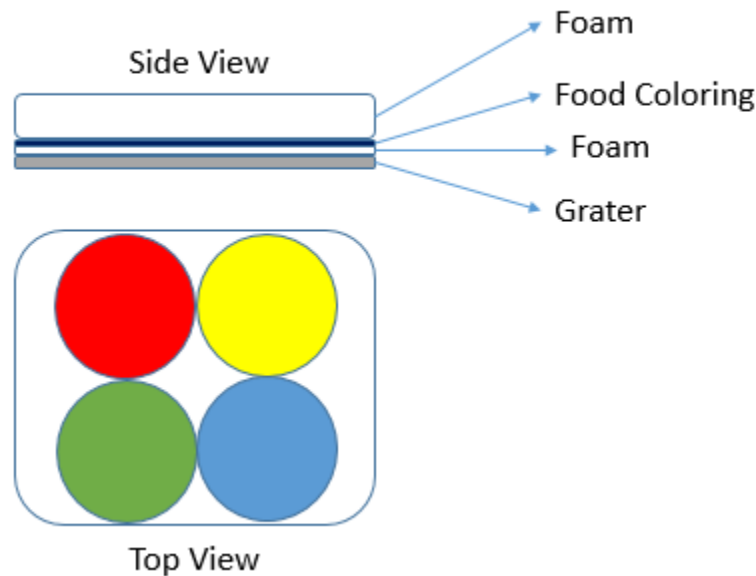


Figure 1: Setup

Surface tension cannot easily be calculated, as it is typically measured using capillary action, which would be another experiment all together [2]. Because shaving cream is a foam, around 95% gas and 5% liquid, it would also make this kind of experiment difficult.

I used an Iphone 8 to take this image. The camera specs can be seen in table 1 below. A standard zoom of 1x was used to take the picture, and the lens was approximately 3 inches from the first layer of foam.

Camera	12 MP
Aperture	f/1.8
Zoom	1-5x

Table 1: Camera Specs

The only edits made to the original image were cropping, to get rid of all the distracting elements in the background, like the sink. The final image, figure 3, focuses on the colored “streams” of shaving cream, which is caused by the surface tension of the foam.

Overall, I think the image does a good job showing how surface tension holds together a liquid. Because foam is about 95% gas, it makes it easier for the foam to hold on to itself compared to a liquid like water, which is why water will fall in drops instead of streams.



Figure 2: Uncropped Image



Figure 3: Final Image

[1] "The Anatomy of a Raindrop." NASA, NASA, pmm.nasa.gov/education/videos/anatomy-raindrop.

[2] "Capillarity-Measuring Surface Tension - Lesson." *Www.teachengineering.org*, www.teachengineering.org/lessons/view/duk_surfacetensionunit_less2.