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MCEN 4151 – 001

Team Third Report

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Figure 1: Thumbnail of video used in post

The purpose of this assignment was for students to take pictures of different types of fluid flow which corresponded to the theme that their team chose. My team chose food and fire as the theme for our images, so I decided to take an image of a grapefruit being burned by a butane torch. We chose this because we thought it would be interesting to see how the acidic juices from the fruit would be ignited by the flame and what flow patterns they would create. Additionally, I thought that this would be a cool phenomenon to visualize in slow-motion video format, which was my primary goal for the third installment of our team posts.

In order to prepare this image, we placed a grapefruit on a concrete ledge away from any flammable materials outside of the engineering center. We then filled positioned our cameras in a place to get the full fruit in frame – about one foot away at an angle of 35 degrees -- and then got the image in focus. From there, we turned on the butane torch and began to burn the fruit and capture the flow. We repeated this step for a few different fruits including lemons and limes. The lighting source for this video was just the flame itself.

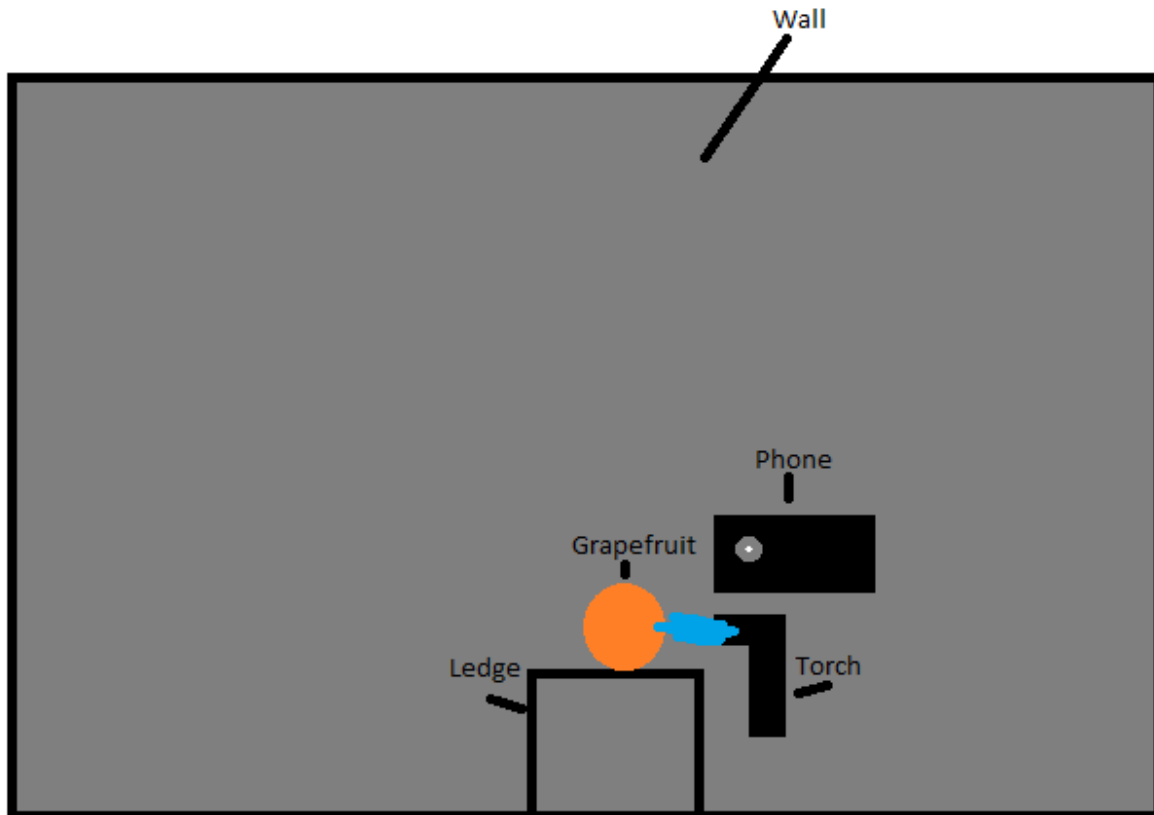


Figure 2: Setup of experiment

I wanted this image to be very straightforward and focus only on the fluid properties of the flame, so I used minimal visualization techniques and editing; I simply set the phone camera to the super slow-motion video setting and recorded. The only editing that I actually did was to crop the video slightly so as to center the grapefruit a little better. In terms of supplies that were used, we had an average-sized grapefruit that can be found at any grocery store and a standard butane torch that can be

found at most hardware stores. The camera used was a Samsung Galaxy S8 set on the super slow-motion setting.

The thing that I liked most about this image was how the flame wrapped around the fruit and how the acid in the juice created an interesting bluish green flame. I definitely believe that I accomplished my goal of capturing a video of a very interesting fluid phenomenon. One thing I would've changed is the focus on the video; the video starts out very blurry and then becomes clear late into the runtime. It was difficult to get the focus correct since it was very dark before the fruit was ignited and I was using the slow motion setting. One question I have is what is the best way to get the focus for a video when using super slow-motion and the subject is in changing light conditions?

[Video acquired with help from Peter Rosenthal, Mary Rahjes, Jennifer Kracha, and Alejandro Barron Toriello]