TEAM FIRST REPORT

By Cort Sommer
Section 1
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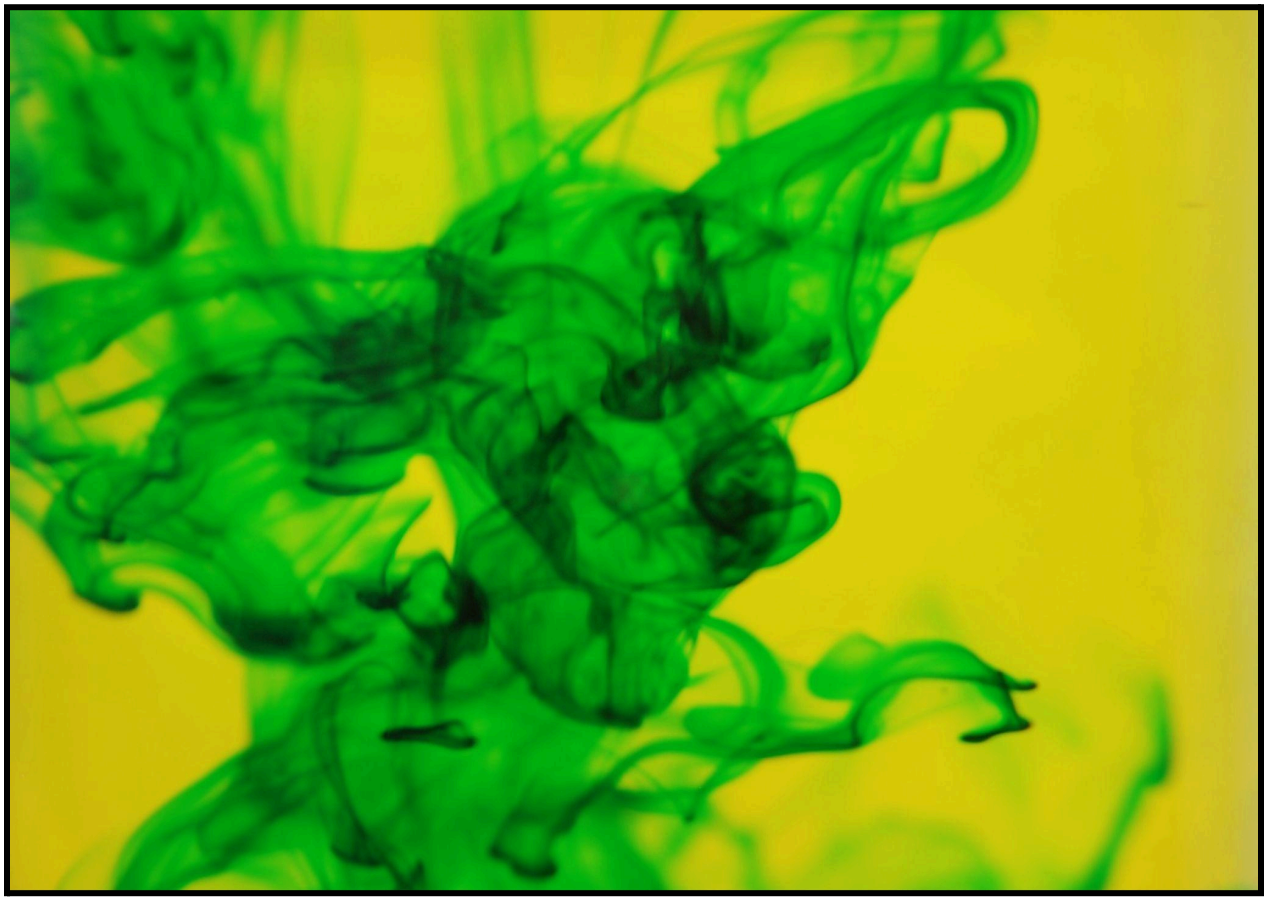


For my Team First assignment, I worked with Hannah Brothers to visualize the slow fall of food dye within a container of water. Our goal was very minimal to begin with, we more or less started out with a list of items to work with rather than having a concrete goal or visual in my mind. That list of items included a large glass drinking mug to act as our basin, a whisk to create chaos and movement inside the glass, and various food dyes to create color and the focus of our visualization. With this photo I was behind the camera while Hannah was managing the dyes and whisk, and vice versa when Hannah was shooting.

The set up for our project, shown below, consisted of the clear glass mug, the suspended whisk, and the camera angled flat and held with a collection of books to be level just below the surface of the water. We would drop the food dye in, let it break the surface of the water, be affected by gravity, and then use the whisk to create movement,

agitating the food dye. We would also combine some colors of the dye. Seen in my final image above, for that particular instance, I used yellow dye which was fully mixed into with the water, and then used the green dye, giving that yellow back drop you can see in the image. The water was then drained so more colors could be tried.

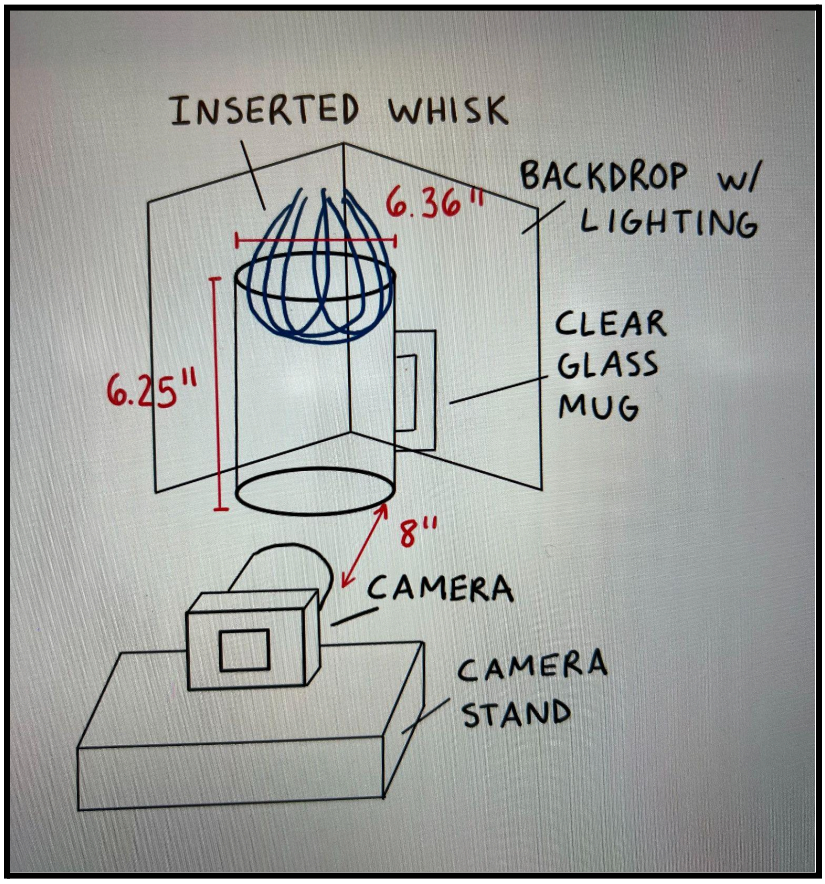
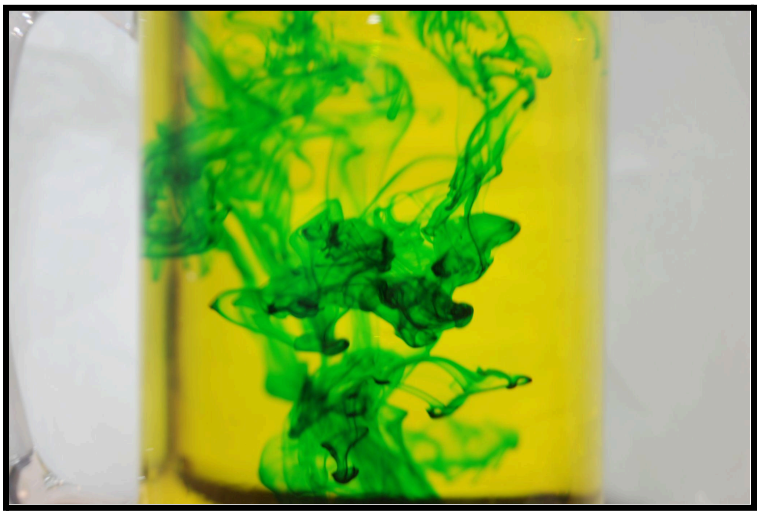


Diagram of our setup

The flow in the final image above is how the dye reacts with water and gravity. There is inherently a lot of chaos in the image and setup, possible movement in the water from outside of the glass, leftover dye pocket from other setups, and the movement of dye drops all create chaos. If we were to calculate a Reynolds number for this, in order to get an idea of turbulence, we need to start off with some assumptions. We can place the fluid velocity at .0625 ft/s (from an estimation that the dye fell through the water at 0.75 inches per second, divided by 12), using information online from water at 10 degrees celsius, we get a fluid density of 62.41 lb/ft^3 and a kinematic viscosity of 0.000014083 ft^2/s. Plugging all of that in we get a Reynolds number of 2219, implying that the current flow is caught in between laminar and turbulent.

Visualization techniques were quite simple for this assignment. There was no use of lighting; We were set up in an ITLL study room so we just used the natural light coming through the windows and the overhead light was turned on for any additional

lighting. This fluid motion was captured on a Nikon D80 camera with an ISO of 100, a shutter speed of 1/10, and an aperture of F5. This was taken with an 18-135mm lens with a focal length of 50mm. The field of view is slightly larger than the width of the mug, as seen below in the original image. The flow was approximately 8 inches from the camera lens. All the post processing that was done was cropping in order to fit the edges of the image flush with the edges of the glass mug.



Original image

Overall I think the image and the project as a whole was very successful. If there was something I could wish for improvement it would be the resolution. I definitely should have tested and played with other shutter speed and ISO combinations with this setup. I think increasing ISO and decreasing shutter speed would have helped with the resolution of this image. However, with all of that in mind, I believe that the outcome was a success.

Sources

- “Swirling Milk.” Science World, 2 July 2020, www.scienceworld.ca/resource/swirling-milk/. Accessed 4 Dec. 2025.

-*Turbulent Flow | Definition, Characteristics, & Facts | Britannica*, www.britannica.com/science/turbulent-flow. Accessed 4 Dec. 2025.

-Reynolds Number Calculator https://www.omnicalculator.com/physics/reynolds-number