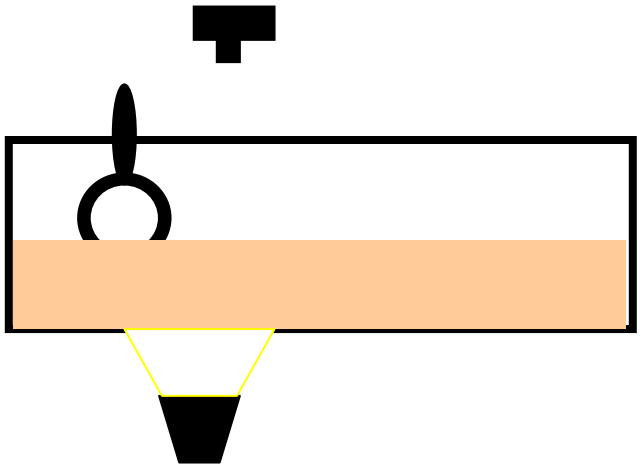
Austin Edwards (837-331)
Group Photo 2

The image presented was an individual effort. Group 3 had three out of the five worked on the project together than involved a mixture cornstarch, water, and paint on top of a car speaker with the speaker creating movement in the mixture. This image cam to be because cornstarch was to be used with a similar phenomenon of forces acting on this mixture in a fish tank. However, the initial idea did not work because the cornstarch immediately sank when added to water. This was then mixed and the light was moved to the bottom of the tank because the tank offers a glass bottom. An image was then captured. After this first image was captured, the whole batch of cornstarch was added for more experimentation. This looked like floating fat when a room light was added. However when a single light was place right up against the mixture, an orange and red glow appeared when the mixture was moved allowing more light through the tank. This is similar to the effect of a human hand up against the light causing a red/orange glow in the hand.



The figure displays the set up. The light is below emitting light through the tank and the mixture. The camera is pointing down at the mixture directly pointing towards the light. A mirror was placed into the mixture and a paddle motion was created

to expose the light below and create movement in the mixture.

This movement is creating a force within the mixture. The image displays the trail that the mirror took and the forces it created. The mixture was moving the in the opposite direction the mirror was moving because every time the mirror would reach a wall the water would follow but then be have a force drive through it in the opposite direction. There were opposing forces that led vectors of the mixture directing towards the mirror and perpendicular direction. The reaction grew through time because the perpendicular forces would then lead the water in either direction of the path creating the shape.

The Reynolds number would be estimation. The size of the tank would be a bit over a one meter allowing me to make one-meter long strokes back and forth. I completed these strokes about a one second back and forth. My movements include active acceleration one direction and deceleration to return the other direction. However given the estimated properties, my velocity was about 1m/sec. At the Engineering Toolbox web site, it was found that the water's kinematic viscosity around room temperature was 0.801×10^{-6} m^2/sec. Re would then be estimated at 1.22×10^{6}.

With movement and limited light, a high film speed of ISO 3200 was used with a high shutter speed of 1/1000s. The aperture was opened to the largest size my camera would allow at these settings of f4.5. The camera then had a setting of continuous capture where the button can be held down and pictures can be shot one after the other until the button is release. This was so that the timing to capture an amazing shot of this fast and sporadic moment was not set on me but by chance of the camera. The continuous capture allow the odds of myself capturing a great shot become better. The frame was

then larger than the top of the tank. This was set so everything in the tank would be captured and the edges and outside of the tank would be cropped out. With myself moving the mirror and taking the pictures, everything needed to be set so nothing was missed.

Dudhia, Anu. "Physics of Stream/Depth & Rowing." *Your Page Title*. Oxford University, 20 Jan. 2008. Web. 01 Apr. 2011. <http://www.atm.ox.ac.uk/rowing/physics/stream.html>.

Water - Dynamic and Kinematic Viscosity. Engineering Tool Box. Web. <http://www.engineeringtoolbox.com/water-dynamic-kinematic-viscosity-d_596.html>.