# Team Third Image

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Film 4200
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## Introduction:

The purpose of this assignment was to explore the way in which India Ink mixes with different, similar liquids. The experiment relies upon differences in liquid density, viscosity, and surface tension and the ways in which these differences can be visually depicted. In order to highlight the variations between these fluids, I attempted to make drawings in each of the mixtures. From the diverse results, it would the contrasting fluid dynamics of each mixture would be evident.

## Setup and Explanation:

For this experiment, you will need a cup of fat free milk (I used lactose-free skim milk; I am not sure if this affected my results in any significant way), a cup of half and half, and a cup of heavy whipping cream. Additionally, you will need a small syringe (I used a needle-less veterinary syringe), a chopstick or other thin, pointed instrument, and a bottle of black India Ink.

To begin, I poured a half cup of milk into a 9" diameter, round, non-stick baking pan. It is important to keep the layer of milk/cream very thin because the ink has a higher density than the milk, cream, and half and half and will sink if the layer is too deep. However, make sure to add enough so that the entire bottom of the pan is covered. With the eyedropper that comes with the India Ink, I dropped a very small droplet of ink into the milk. With a chopstick, I swirled the ink into a simple spiral. Since the ink has such a high level of surface tension, it beaded up and clung to itself, as opposed to blending with the milk. The result created the marbled pattern in the far left picture of the series.

For the second image, repeat the same steps listed above, but with a half cup of half and half instead of milk. For this image, I used my chopstick to try to draw a cow skull, though the mixture was very fluid and did not hold shape very well. With each movement of my chopstick, the ink would inconsistently swirl into the half and half in unpredictable patterns. Unlike the milk mixture, this mixture did not marble, but instead mixed in varying amounts to create a wide range of textures, shapes, and shades. This is due to the similarity in the viscosity levels of the fluids, which allows them to blend well when mixed, but remain mostly separate when undisturbed.

For the third image, the same steps are repeated once again but with heavy cream instead of half and half or milk. When dropping the ink into the cream, it is interesting to note how the blot would rapidly expand into a large puddle, and then slowly retract into a medium sized blob. With my chopstick, I was able to drag some of the ink into shapes to create the fishbone design. With my small syringe, I dropped a bead of cream into the head of the inkblot for the fish's eye socket. This worked because both liquids have a

very high level of surface tension. This, coupled with the ink's high viscosity allowed me to arrange the ink as I pleased without the design bleeding or mixing.

## Photographic Technique:

For this image I used a Canon EOS Rebel XT DSLR with the wide angle kit lens. Since this is an older camera that I was unfamiliar with, I had the settings set to Auto. However, in order to produce a similar image with manual settings on a DSLR, I would recommend using overhead fluorescent lighting (as I did in my images), an ISO of 200 to reduce film grain, a very quick shutter speed (between 1/800 and 1/2000 of a second), and a low f-stop (since the picture will be taken indoors and therefore lacks sufficient lighting). The high shutter speed is necessary to avoid motion blur, since even a very slight nudge to the pan or gentle breath of air can disturb the mixture. I also recommend using autofocus, because it is easy to accidentally focus on the reflection of the ink around the edges of the blot instead of focusing on the ink itself. The result would be a slightly out-of-focus image with a confusing double-edged effect around the edge of the inkblot. A standard 18-55mm wide angle lens is suggested, though the use of a macro lens could potentially capture an interesting perspective of the closeup details in the mixture.

The photo was taken from directly 18 inches above the surface of the mixture, looking down perpendicularly. To avoid capturing the shadow of the camera in the image, I also recommend enabling the camera's flash (as it is much easier to edit out the small glare of the flash in Photoshop than it is to edit out the entire shadow of your hands and the camera.) I unfortunately, did not discover this until it was too late, and therefore spent a lot of time in post editing out the shadow with the Photoshop dodge tool. Aside from this, the only editing done to my photos was to resize them to be equal sizes and to change the contrast and brightness just enough to give the photos a similar white balance.

## Conclusion:

Overall, I am very pleased with the way that my photos turned out. In the future, I would love to experiment more with this idea with a higher quality camera, better lighting, and more time. However, all things considered, I feel that the photo series which I produced both demonstrate the similarities and differences of the physics of the substances well, and also create a wonderfully artful display.