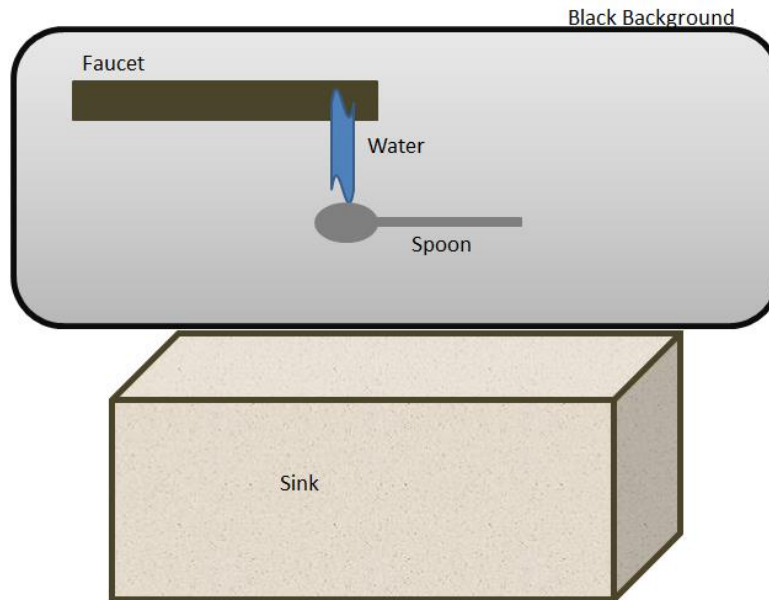


The purpose of this assignment is to create a quality image of some kind of flow phenomena. It is also for students to become more familiar with cameras and experimental set ups. The intent of the image is to observe what happens to water as it contacts a curved surface.

I chose to set the experiment up over my kitchen sink. I used a spoon with a curved surface of approximately two inches. The spoon was held above the sink drain and the sink faucet was held about two inches above the spoon. The background was a box with black velvet fabric draped over it. The set-up is shown in diagram below.



Different water pressures were tested but the most interesting results occurred when there was a medium flow. The temperature of the water was 21 degrees Celsius. The Reynolds number describes a ratio of the inertial and viscous forces. The equation below shows the Reynolds number for the flow photographed.

$$Re = \frac{UD}{\nu} = \frac{\left(\frac{0.5m}{s}\right)(0.18m)}{\frac{1m^2}{s}} = 0.09$$

This is a relatively small Reynolds number which would conclude a laminar flow. It is also important to note that the flow was aerated before hitting the spoon. There is also a “fish boning” effect after the water hits the spoon. The surface tension in the water keeps it together but droplets form and fall. This separation looks like the bones of a fish.

The image was taken pointing directly at the spoon at a distance of six inches. The camera used was a Canon SX10 with image stabilization with the flash on. The flash was used to better “freeze” the flow. The light was diffused by a tissue to reduce the reflection from the spoon. The aperture was at F/2.8. The shutter speed was set at 1/60 to reduce any motion blur. The ISO was at 250. The original size of the

image was 3648x2736 pixels. The field of view is about eight inches. The image was cropped and converted to black and white during post processing. Some spots were also cleared using a clone stamp tool.

I think the fluids are well shown in this because the details of the water are in clear focus. I dislike the noise in the black background but I think it gives the picture more texture. Next time I do this experiment I would like to improve the lighting. I think using a studio flash would decrease the reflections while still capturing the flow. I could also try taking images when the spoon is flipped in the other direction. This would create more splashes but would show different physics.