Icicle Report

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   This image is of an icicle forming off of the corner of house where a gutter drips water. The photo zooms in on the tip of the icicle to see the water droplet forming on the tip before it fell to the ground. The icicle I took a picture of was about a half of a penny thick and about an index finger long.

   Icicles are somewhat of an undiscovered science but there is some information being collected on them. The icicle forms when the conditions are just right. A heat source, which in my case was direct sunlight started to heat up snow on the roof of the house causing it to slowly melt. This caused water to slowly drip into the gutter and off of the house. If the surrounding air was too hot then that water would not freeze and if the surrounding air was too cold then the water would not have melted in the first place. The water dripped off of the gutter and the surrounding air was cold enough to slowly freeze these water droplets until many hours later a whole icicle was formed. The icicle was in the shade under the edge of a house so it created this cool temperature while the roof had the direct sun to melt the snow. Once the icicle is initially started it can freeze more easily because the water dripping down is in a thin film allowing it to freeze more easily. The icicle also had ripples in it, which is caused by a different set of physics. There are salt

compounds in the water such as calcium or sodium, which are common impurities in snow or even tap water that cause the ripples in the icicle.

The conditions of temperature were perfect for my icicle to form as I mentioned in the above paragraph. I caught the icicle at the perfect time. It had already formed and was continuing to form. Water was dripping down the icicle partially freezing as it made its way to the bottom of the icicle. Once it was there the left of water that didn't freeze would turn into a droplet and fall off of the end once it was heavy enough for gravity to make it fall. This would happen every 30 second or so allowing me to capture the droplet at various stages. I would see it start to drip down the icicle. Then I would see it form at the bottom and then I would see it form into a bigger droplet. At this point you could see a convex image of the clouds through the droplet. The clouds were upside down because of the convex of the droplet. The lighting was direct sunlight which front lit my droplet of water on the icicle and allowed the cloud and blue sky to be illuminated through the droplet on the end of the icicle. This gave the droplet some more color and helped the picture come out better.

Image Specs

Aperture: 5.6 f

Shutter: 1/5000

ISO: 3200

Distance of camera from object: 2 inches away

Field of view: 2 inches

100 mm focal length

Digital Camera: Canon EOS 7D

Lens: Canon EF 100mm f/2.8 Macro lens

 Pixels: 5184 × 3456

Total Pixels: 17915904

Post-Processing:

Adjusted highlights, blacks, contrast, and white balance in Adobe Bridge

I choose to take the picture at f 5.6 because that aperture gives the picture the ultimate sharpness. I didn't need much depth of field for this picture because I wasn't trying to capture the background or multiple planes. I was just trying to get the icicle and droplet in focus, which were all at the same distance from my camera.

I wanted the image to be as sharp as possible so I choose f 5.6. When I was taking the pictures I was originally trying to capture the water droplet as it was falling off of the tip of the icicle. I therefore chose a very high shutter speed of 1/5000. This was so I could freeze the droplet mid-air with no motion blur. I needed the high ISO in order to keep the right exposure with such a fast shutter speed. The high ISO makes the image more sensitive but can increase digital noise. My camera didn't pick up much noise at the ISO luckily. The image I have was taken in between waiting for the droplets to fall off so I had the same settings for exposure. After looking at all of my images I enjoyed the flow of the droplet forming more than one falling so I choose that picture. If I redid the picture to only go for the image of the droplet forming I could make the shutter much slower for example 1/200 and also bring the ISO way down. I used a macro lens so that I could get up close and get all of the detail on the icicle and the droplet. It allowed me to get in focus at a very close distance of 2 inches from the icicle. If I had used a wide-angle lens there would have been a lot of background around the icicle. I just wanted the whole picture and all of the details to be as close up as I could get to the icicle with it still being in focus. I used post-processing in order to increase the contrast and lower highlights while increasing blacks. I also adjusted the white balance to take away the yellow tint of the background and change it too more of a white.

This image reveals the fluid flow of a drop of water forming into ice and falling off of the end of an icicle. I like how my image captured the droplet forming while encompassing an image of the clouds inside of the droplet. I dislike the rest of the background behind the icicle. I would like to have an interesting pattern with flashy colors behind the icicle to give it a more aesthetic appeal. A question I can think of is how do you know if the icicle is being formed when you see the water dripping down or if the icicle is just melting. I didn't fulfill my intent of capturing the droplet of water falling off of the icicle but I got a picture I am equally happy with. In the future I could expand this idea by trying to find really interesting things to frame with the droplet forming on the end of the icicle. I would like to get a bunch of interesting colors framed through the convex image created by the droplet.

References:

- Website Title: **Washington Post**
- Article Title: **Icicles: A symbol of winter and a scientific mystery**
- Publisher: **The Washington Post**
- Electronically Published: **February 07, 2014**
- Date Accessed: **February 12, 2014**
- Author: **Meeri Kim**

Image before post-process:

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