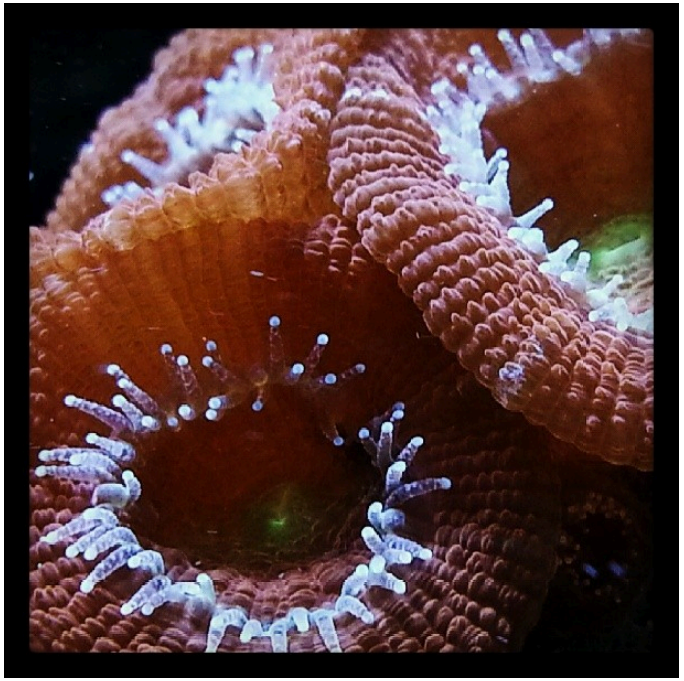


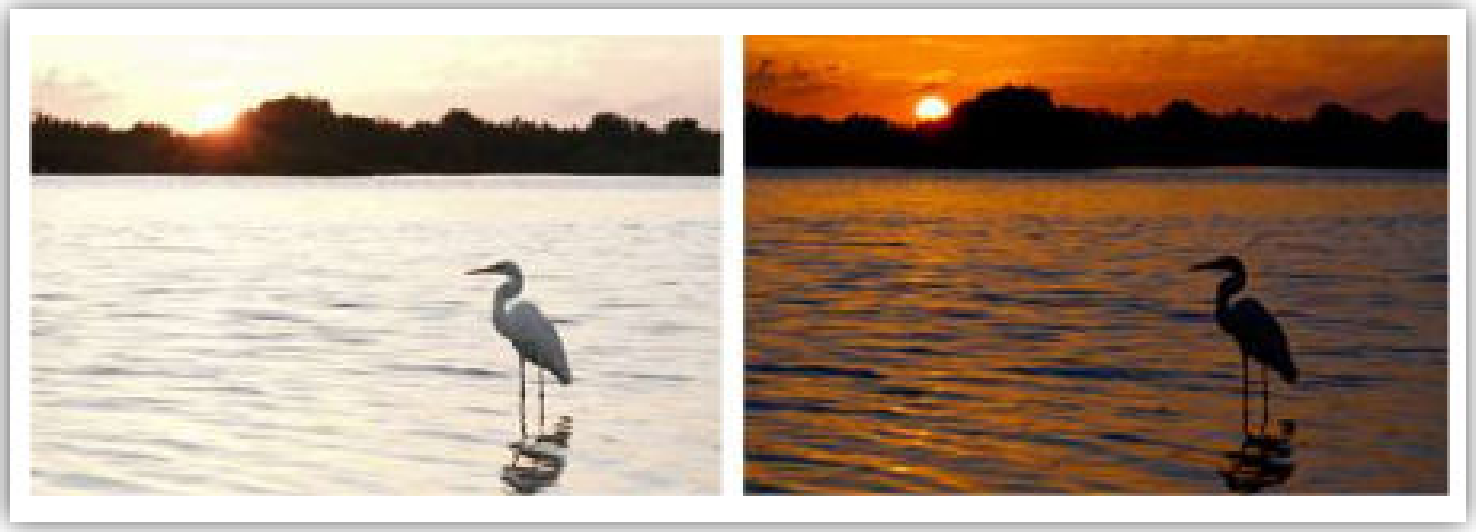
Photography In The Reef Aquarium

CTARS

February 28, 2016



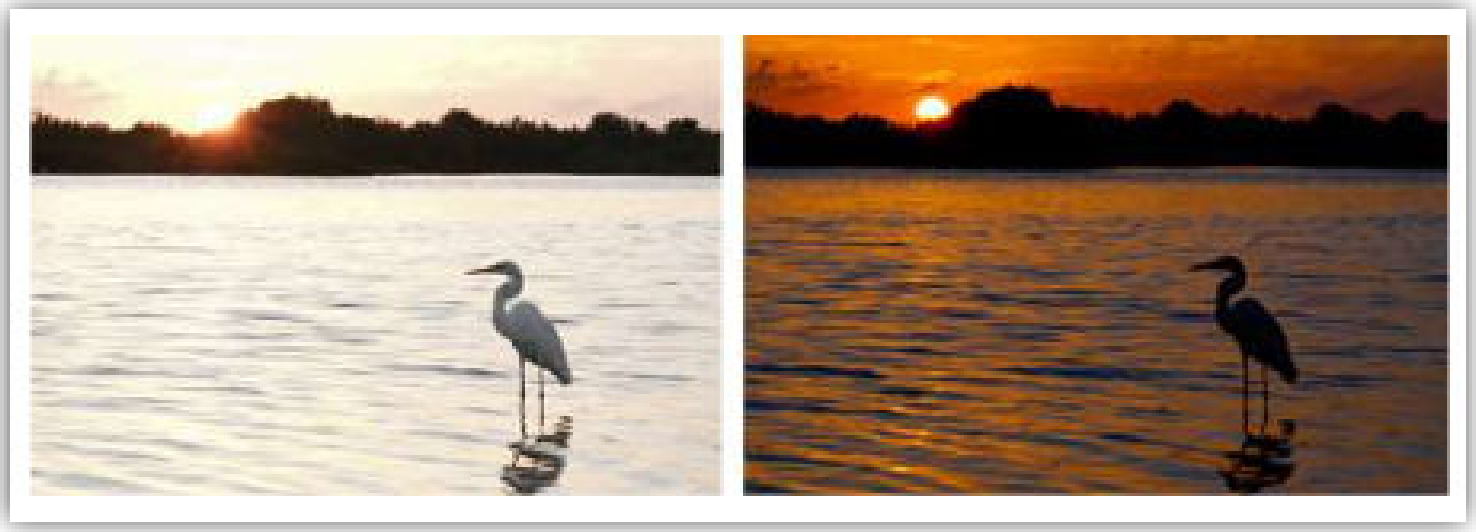
Which Photo Do You Prefer?



The only difference between these two pictures is that one was shot with automatic exposure, and the other was shot using creative exposure.

Probably the picture on the right! By choosing a creatively dark exposure, the rich colors in the sunset were allowed to shine through. However, technically, the photo on the left is “correct,” and the photo on the right is “incorrect.”

Which Photo Do You Prefer?

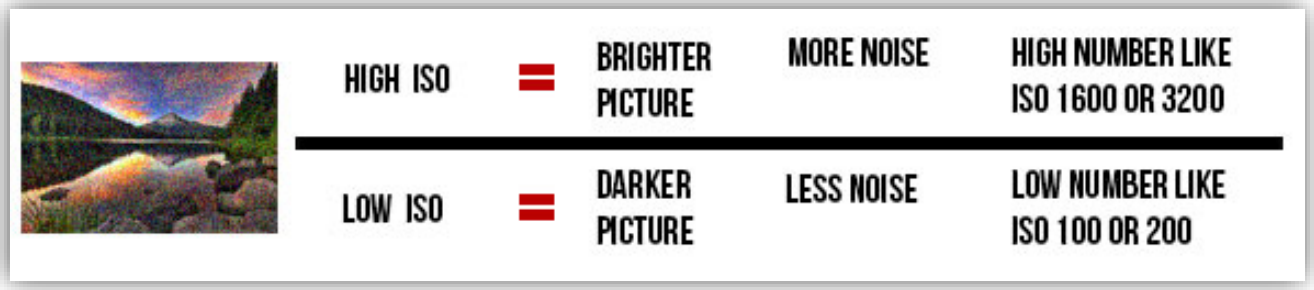


The only difference between these two pictures is that one was shot with automatic exposure, and the other was shot using creative exposure.

The camera saw through the lens and tried to expose the bird so that it wouldn't become a shadow. The photo was not about exposing the bird properly, but exposing the sunset properly. The bird was just a nice shape to include in the foreground. This is exactly why you must learn exposure–because sometimes the "scientifically correct" exposure is not the best exposure to make the photo look how you want it to.

Photography Basics

- ISO

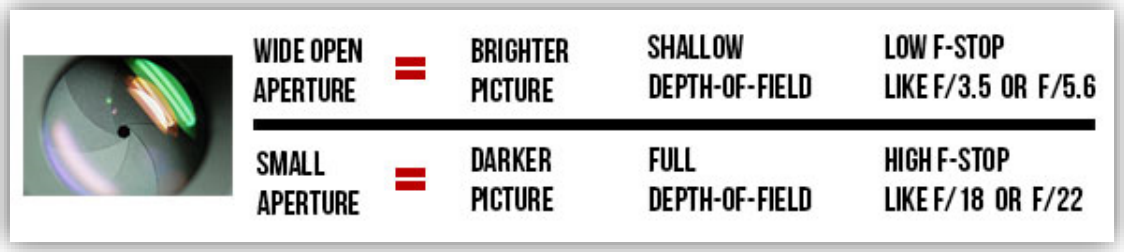


- The ISO controls the exposure by using software in the camera to make it extra sensitive to light.

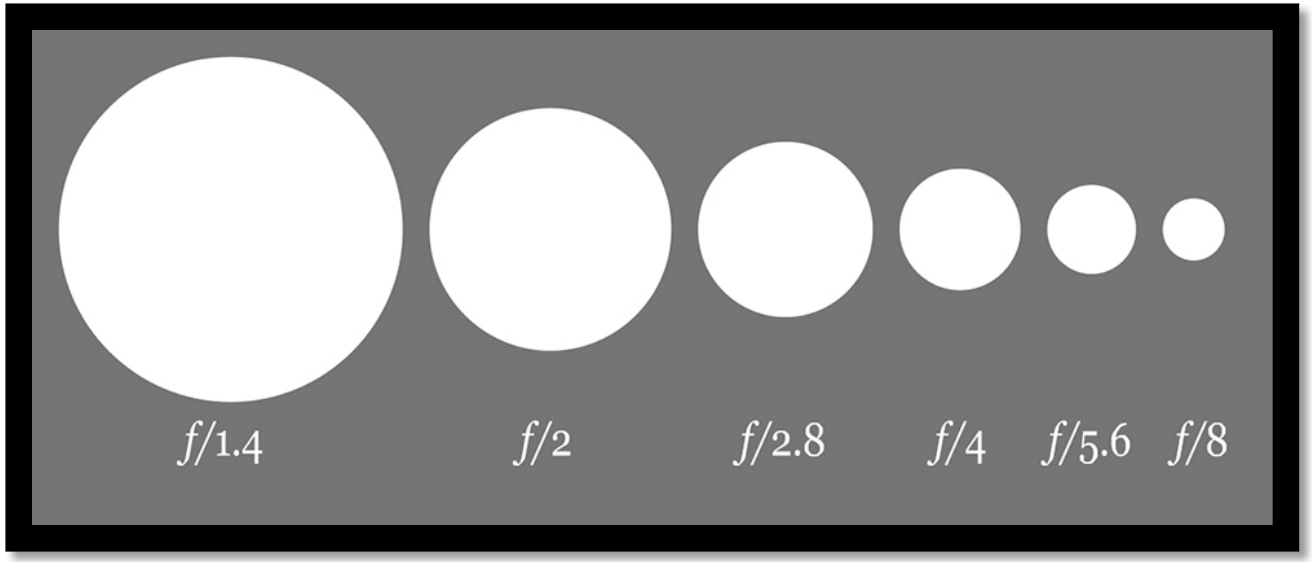
- A high ISO such as ISO 1,600 will produce a brighter picture than a lower ISO such as ISO 100. The drawback to increasing the ISO is that it makes the picture noisier. Digital noise is apparent when a photo looks grainy. Have you ever taken a picture at night with your cell phone or your pocket camera, and noticed that it looks really grainy? That is because the camera tried to compensate for the dark scene by choosing a high ISO, which causes more grain.

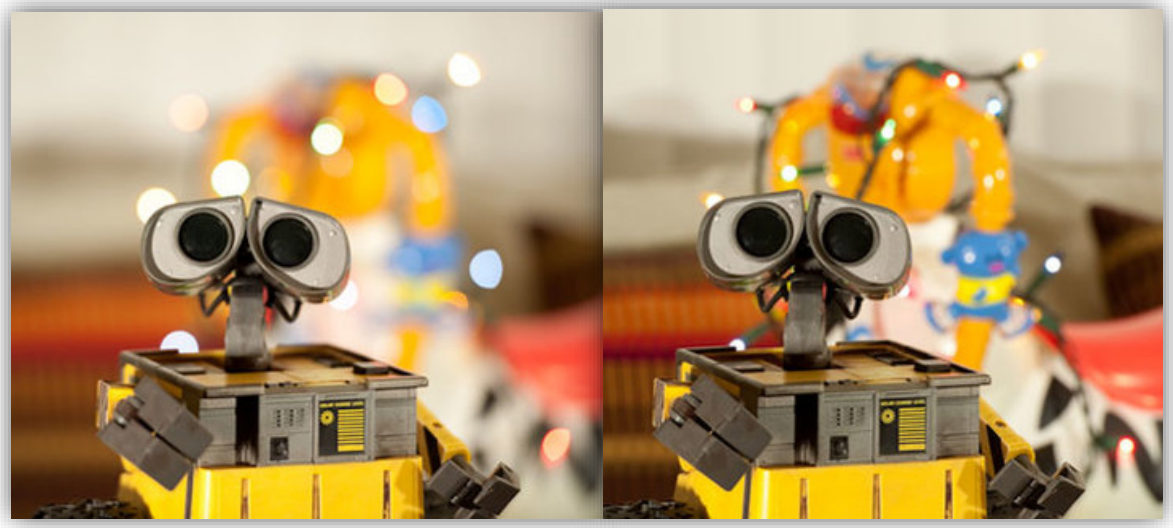
Photography Basics

- Aperture



- The aperture is a small set of blades in the lens that controls how much light will enter the camera.





As you can see, just changing the aperture from f/2.8 to f/8.0 has a big effect on how much of WALL-E is in focus and how visible the background gets.

Also notice as you change the aperture, the brightness of the photo also changes.

The size of the aperture has a direct impact on the **depth of field**, which is the area of the image that appears sharp. A large f-number such as f/32, (which means a smaller aperture) will bring all foreground and background objects in focus, while a small f-number such as f/1.4 will isolate the foreground from the background by making the foreground objects sharp and the background blurry



Exposure: 1/350th sec at f4.0. The depth of field at this distance is so shallow that many of the “tentacles” are in focus at the base but out of focus at the tip.



A little further away from the subject, the depth of field appears deeper… but not much. (Exp: 1/750th sec. f2)

Photography Basics

- Shutter Speed



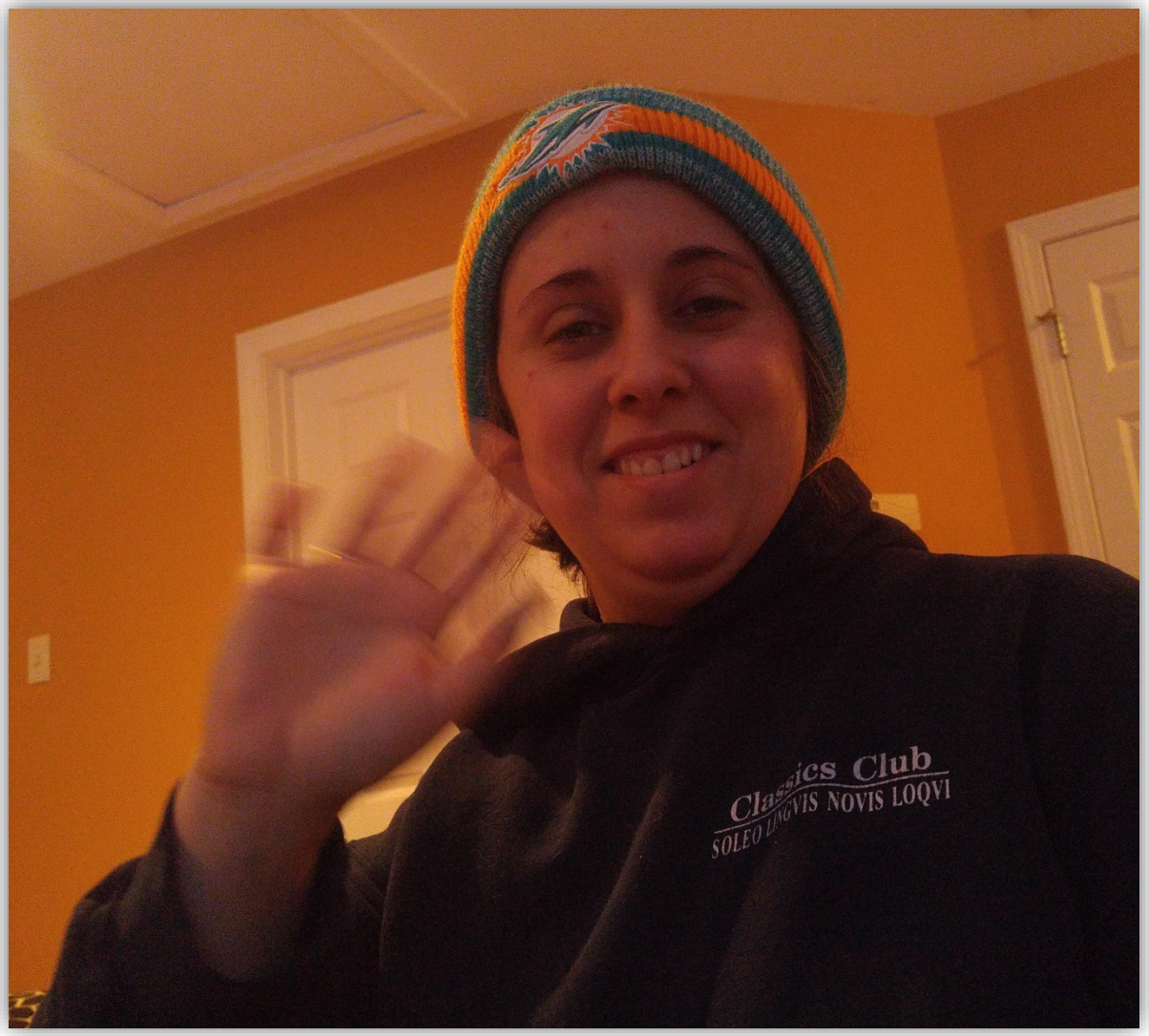
FAST SHUTTER SPEED	= DARKER PICTURE	LESS BLUR	SMALL FRACTION LIKE 1/800 OR 1/1000
SLOW SHUTTER SPEED	= BRIGHTER PICTURE	MORE BLUR	LARGER FRACTION LIKE 1/60 OR 1/80

- The shutter is a small "curtain" in the camera that quickly rolls over the image sensor (the digital version of film) and allows light to shine onto the imaging sensor for a fraction of a second. The longer the shutter allows light to shine onto the image sensor, the brighter the picture since more light is gathered. A darker picture is produced when the shutter moves very quickly and only allows light to touch the imaging sensor for a tiny fraction of a second. The duration that the shutter allows light onto the image sensor is called the shutter speed, and is measured in fractions of a second.
- Just as the aperture affects the exposure as well as the depth-of field, the shutter affects more than just the exposure. The shutter speed is also principally responsible for controlling the amount of blur in a picture. If you think about it, it makes sense that the shutter speed controls how much blur is in the picture.



Picture taken at 1/8th shutter speed, 1.8 (large opening) aperture, 700 ISO

Imagine me sitting here at my computer desk waving to you . If you take a picture of me with a shutter speed of 1/8th of a second, then my hand will have moved in the time that the camera is recording the picture. To get rid of the blur, you need to increase the shutter speed.

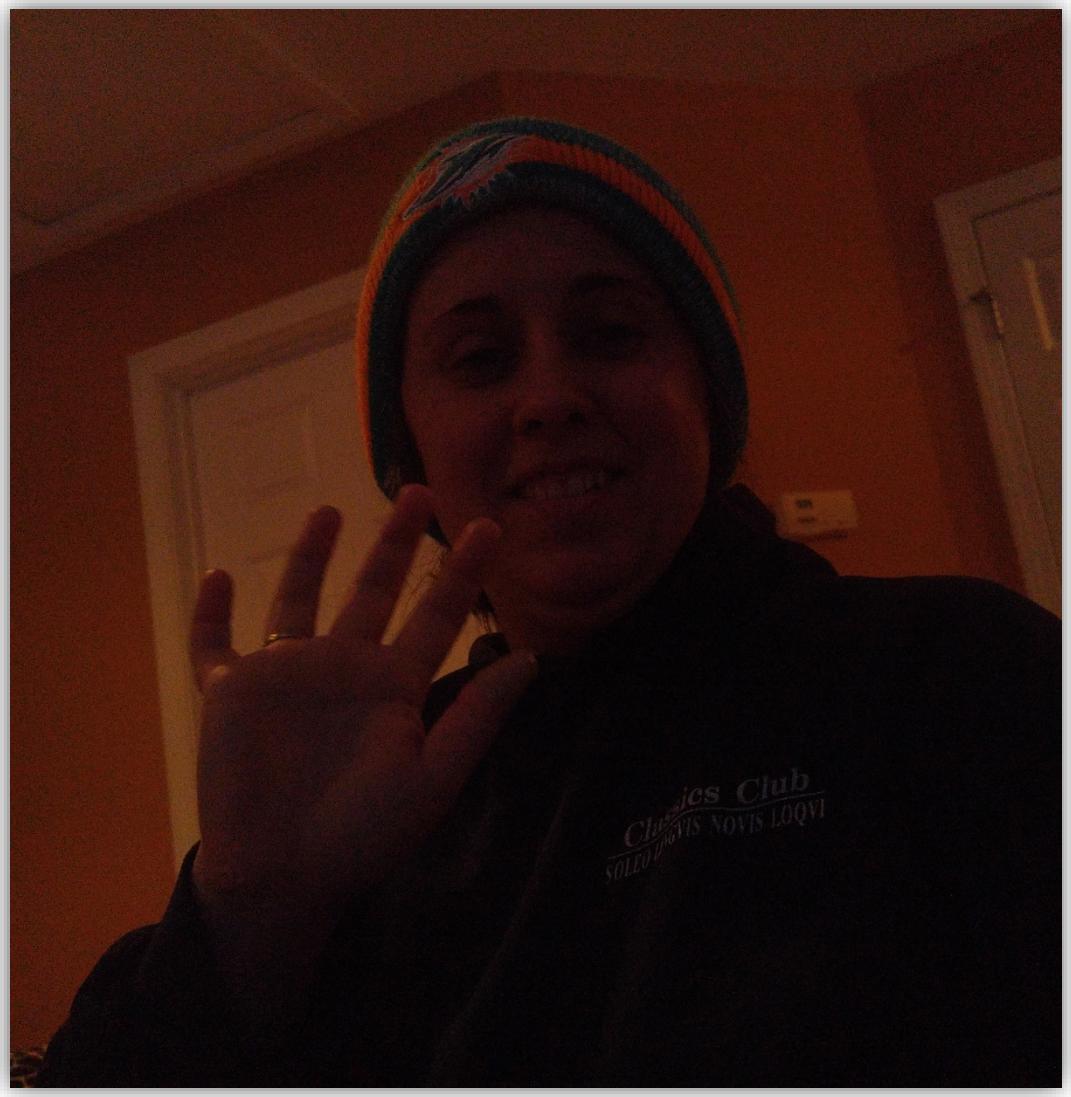


Picture taken at 1/60th shutter speed, 1.8 (large opening) aperture, 700 ISO

At this speed, my hand is still moving.

You will also notice that the picture is getting darker as less light is traveling to the sensor.

This is why we might need to adjust the other settings to get a well balanced photo.



Picture taken at 1/250th shutter speed, 1.8 (large opening) aperture, 700 ISO

At this speed, the camera takes the picture so fast that my hand travels only such a small distance that it is not as noticeable in the picture.

Because we did not make any other adjustments it is too dark to discern much of the detail.

Let's watch a video by Tidal Gardens to recap…

https://youtu.be/McneJvCWmf8

Photography Basics

- White Balance

- The first thing to remember is that different light sources emit different colored light. One measure of overall light color is "color temperature" and the standard unit of measurement is kelvin.

- Using some measures "normal" daylight is approximately 5,600 kelvin - usually referred to as 5,600K.

- The lower the color temperature, the more reddish or "warmer" the light. Have you ever noticed how warm the light appears at sunrise? It's nearly the same color temperature as a tungsten light. At midday it's much bluer, cooler, at roughly 5,600K. An overcast sky is even cooler (around 7,000K), and if you pointed your camera straight up at a clear blue sky, you'd get a reading of roughly 9,000K.

Photography Basics

White Balance

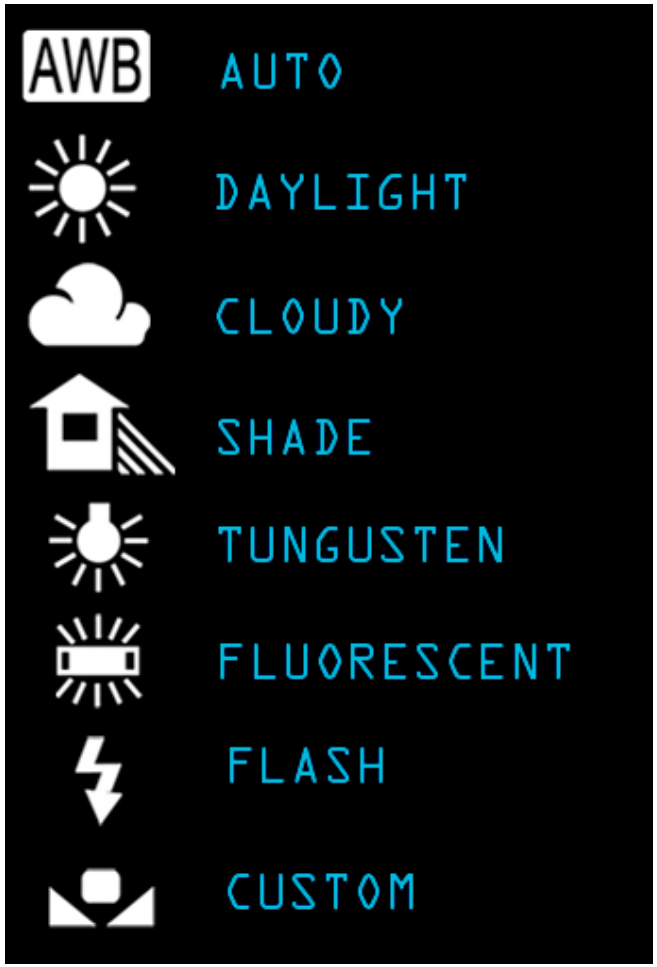
- Those are all common color temperatures and our digital cameras have no trouble accurately rendering photos taken in their light.
- Where we run into trouble is with actinic and metal halide lighting; it's far bluer than anything a camera normally encounters. Just about every digital camera available, no matter how inexpensive and fully automatic, can take outdoor photos with accurate color, because the color temperatures outdoors are rarely below 3,000K or above 10,000K. But in our aquariums? Getting a good picture from them is much more difficult, as most of us have discovered.
- The reason digital cameras have trouble with our tanks is that the white balance circuitry in most of today's cameras is not programmed to deal with light that is far beyond 10,000K. So, if you're having trouble getting accurate colors, and you're using 20,000K metal halide lights, that's why.

Photography Basics

White Balance

- So what does selecting a white balance actually do? In the most basic terms, it tells the camera what white looks like under a specific light source. Once the camera knows what white is, then it can calculate how all the colors in the image are supposed to look.
- There are several ways, from simple to more complicated, to adjust white balance in our photographs. We can change WB setting before we take a picture (always recommended) or later in photo editing software. The most simple way to change WB is to use one of the pre-set setting almost all present digital cameras have. Those are usually represented in camera menu as little icons with name labels like these:

Photography Basics
White Balance



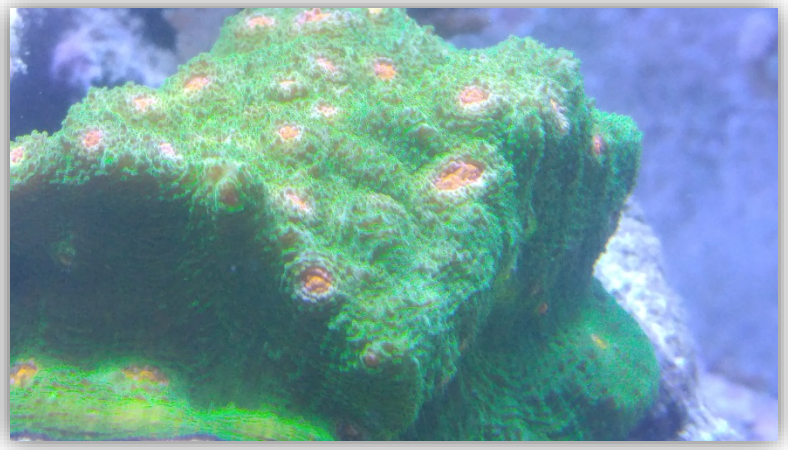
- AUTO- camera automatically adjust white balance according to the scene- works in most situations, but definitely not in saltwater aquariums
- DAYLIGHT- best used for outdoor photography during daytime, useful in freshwater aquariums that uses 6500K bulbs
- CLOUDY- one of the two presets best suited for reef photography, it warms colors up removing much of a blue hue
- SHADE- another great WG preset to shoot reef tank,
- TUNGUSTEN- a yellowish Color Balance setting, unsuitable to either freshwater nor saltwater photography
- FLUORESCENT- somewhat usable preset for tank lighted with 10000K light source
- Flash- same as above, useful in flash photography
- CUSTOM- using this preset guarantee good results , but adjusting it requires some effort. Custom White balance setting rely on external “reference” object. To properly set this setting, photographer needs a piece of white card or paper, from which camera reads the Color Balance by making a pre-shot and adjust White Balance based on the “reference card”. Unfortunately, not all cameras have custom White Balance Preset

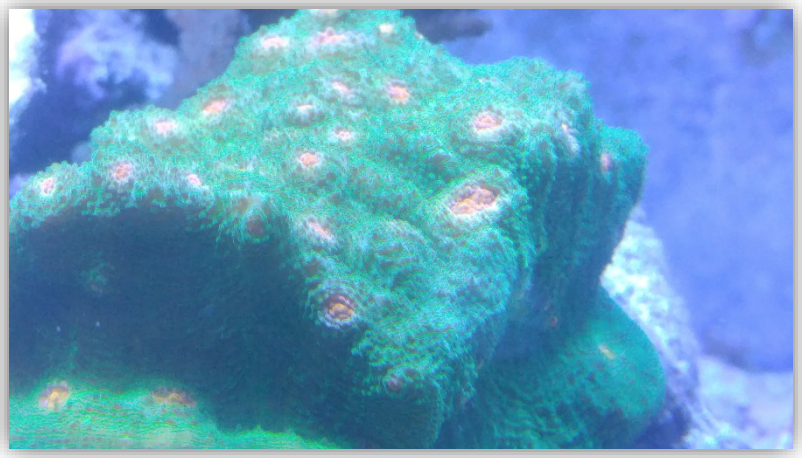


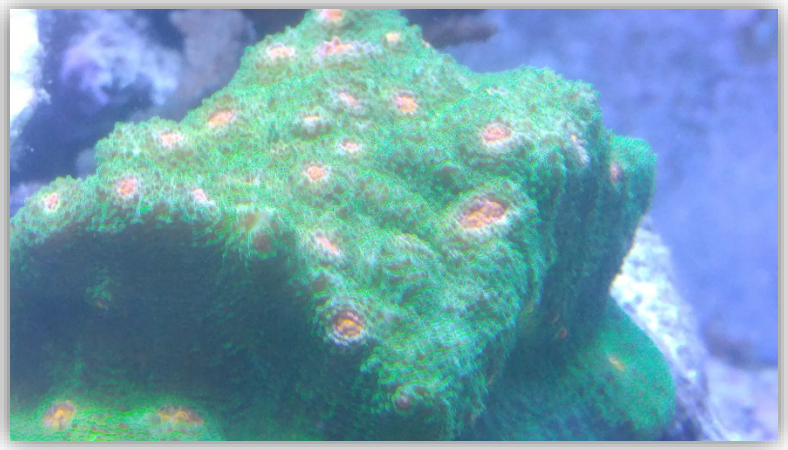
Here is a full tank shot taken at different White Balance settings.

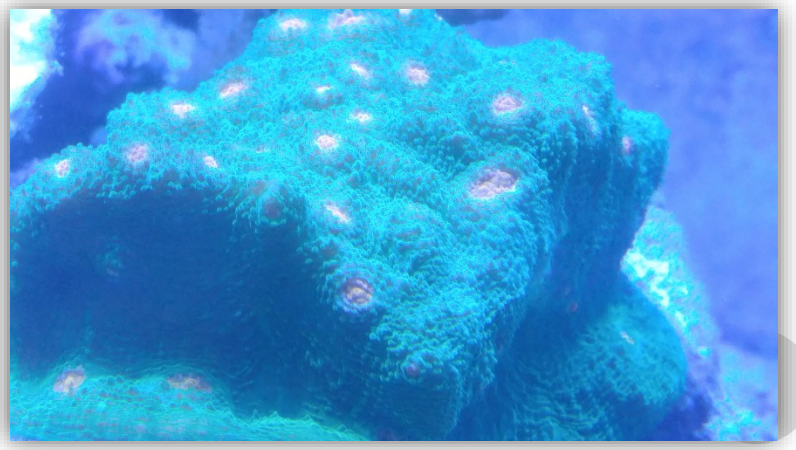
Notice how the blue tones vary from one White Balance setting to another.

Photography Basics
White Balance









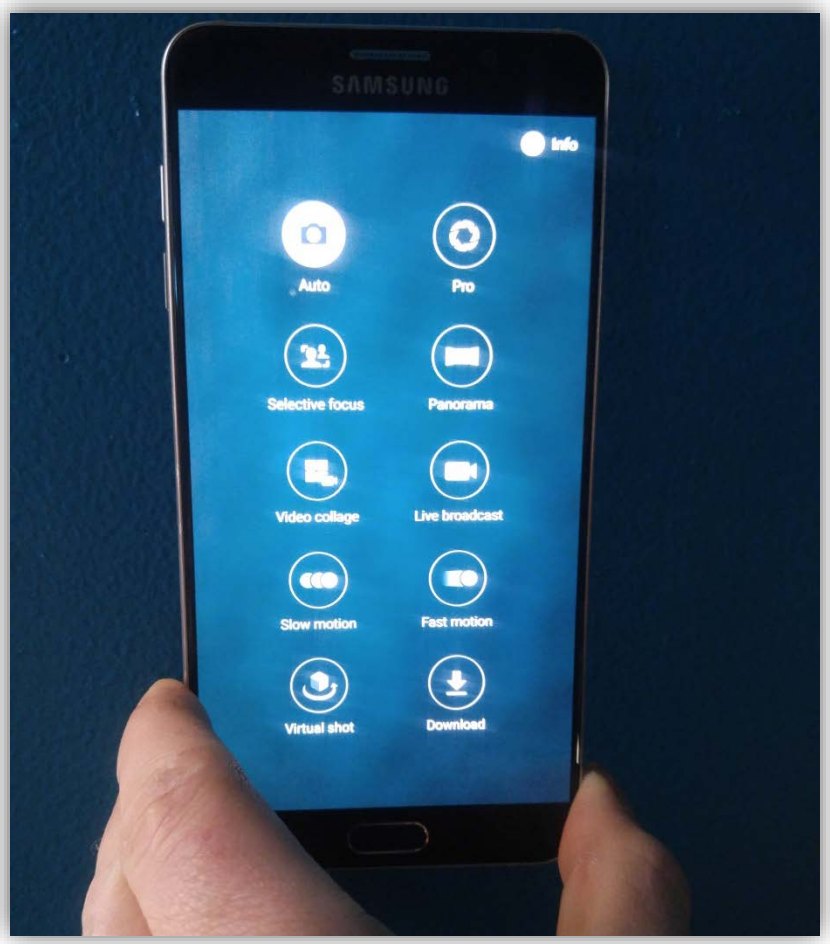
Photography Basics
White Balance



- Different camera models use different steps for manually setting the white balance.
- Consult the manual for the steps necessary for your particular camera. After you're familiar with which buttons to press and in what order, you're ready for the next step: taking a picture of something white with the light source hitting the white object directly.
- Find something that is white (the lid of a kalkwasser container or similar white plastic lid works well since it's plastic and won't be harmed if it gets wet nor will it harm the tank), and hold it under the aquarium lights so that it's completely lit by the same light that is lighting your tank. Then take a photo of the white object.
- This will allow you to set a custom white balance.

Cell Phone Photography Tips

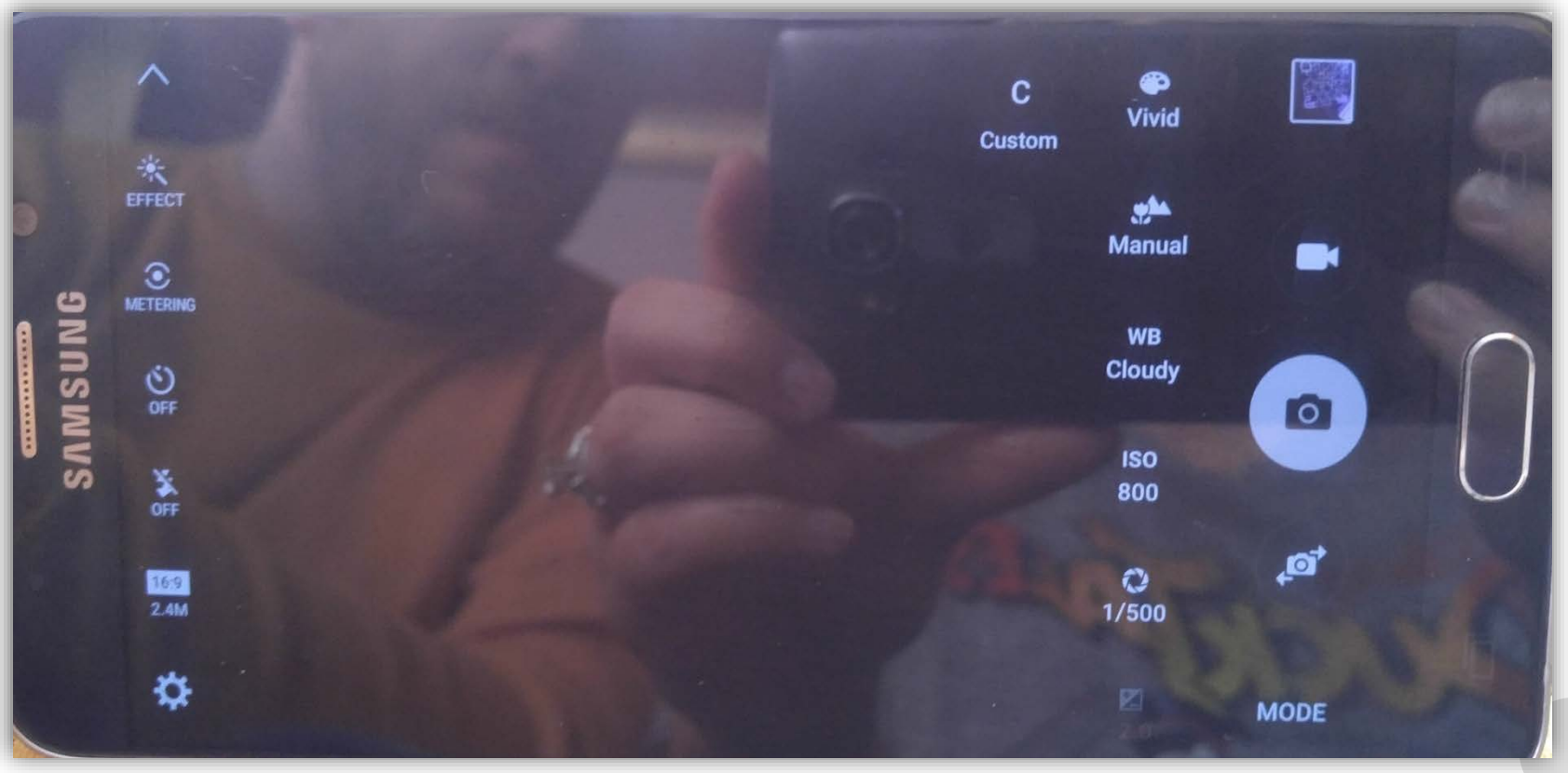
- Learn your camera settings



- Try getting out of the “AUTO” mode and playing around with some of the other features.
- Most newer smart/iPhones have some features, such as white balance and exposure, that you can manipulate yourself.

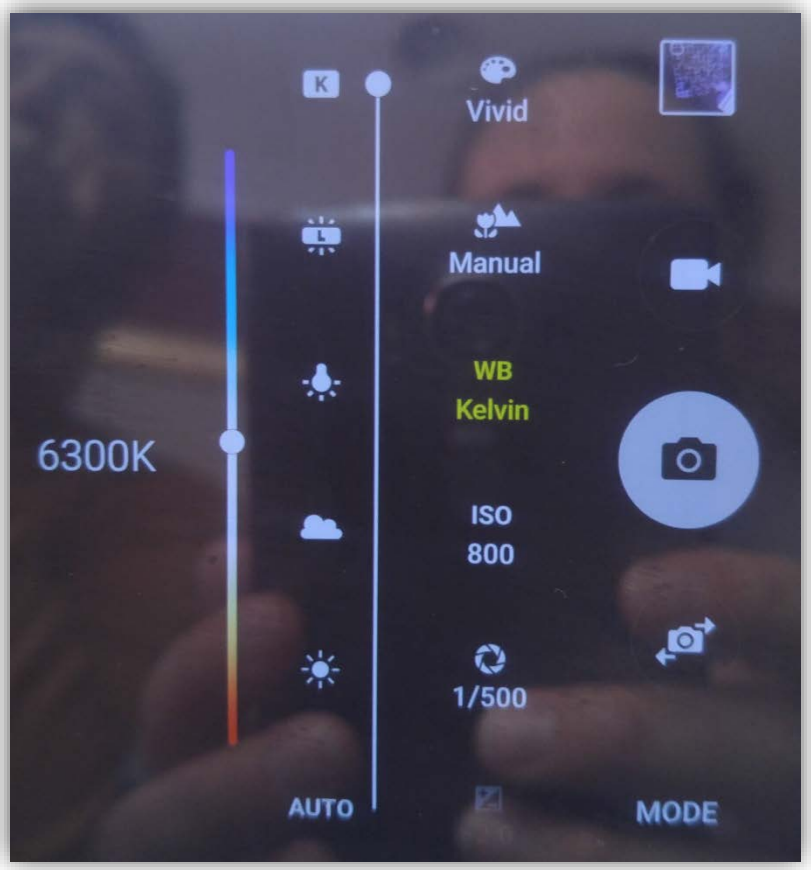
Cell Phone Photography Tips

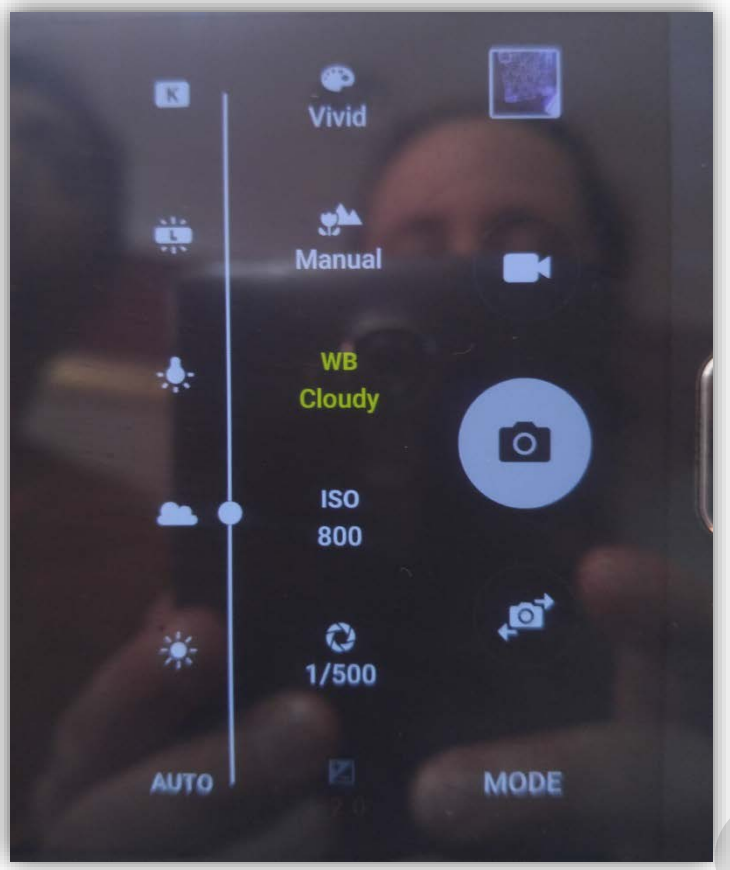
- Learn your camera settings



Cell Phone Photography Tips

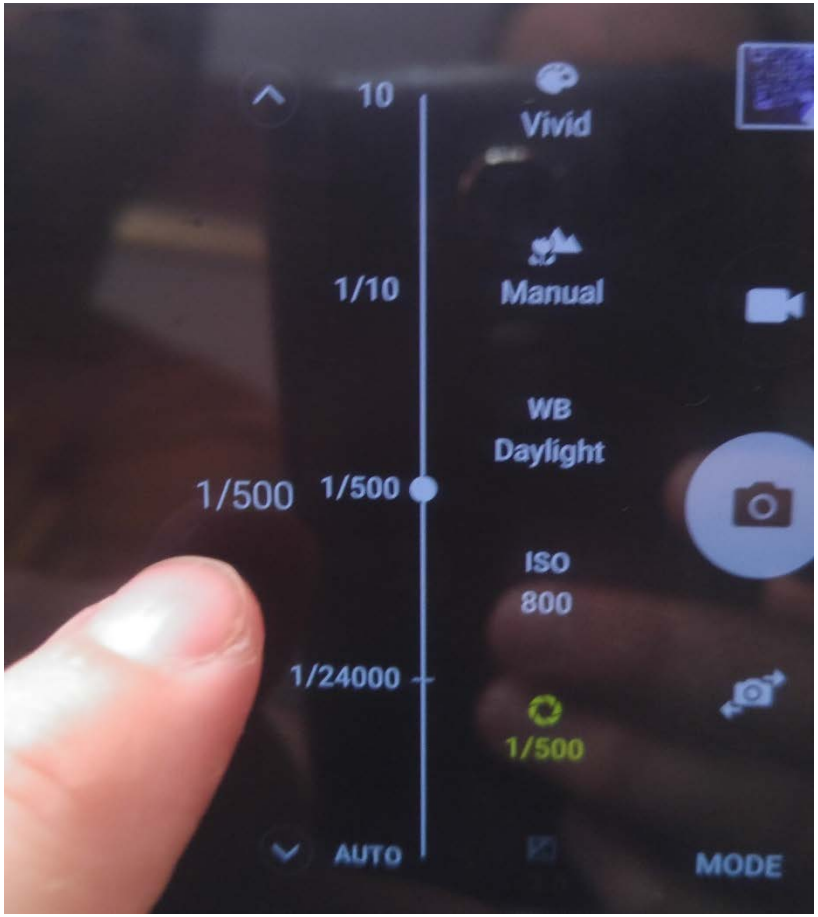
- Learn your camera settings

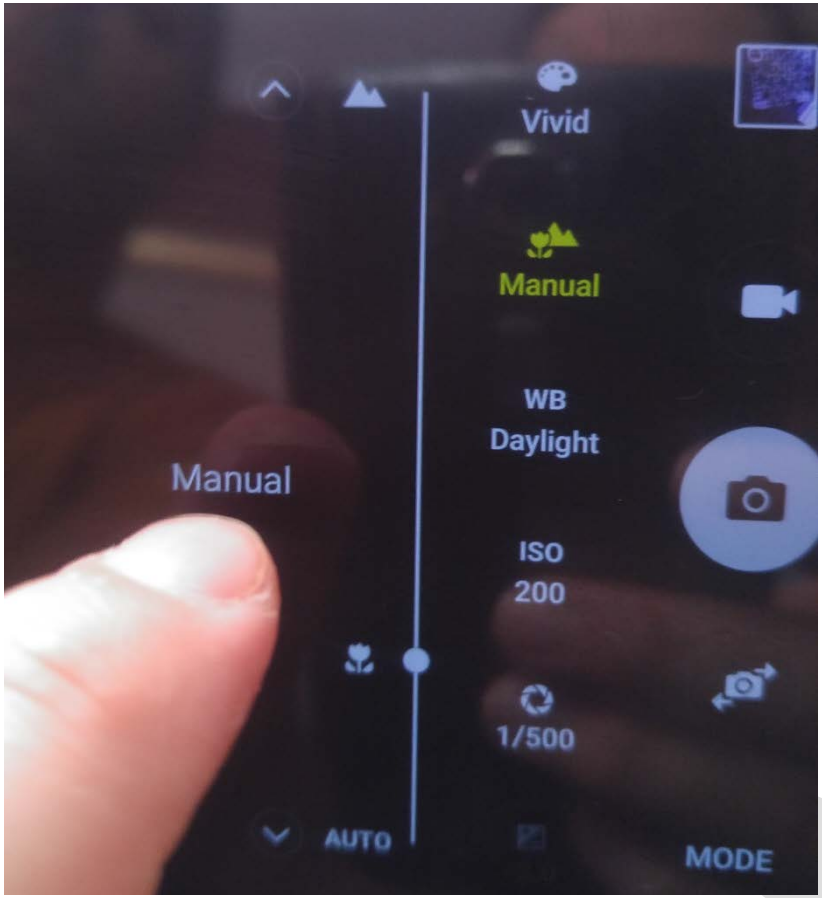




Cell Phone Photography Tips

- Learn your camera settings





Cell Phone Photography Tips

- Clean your lens



- Your phone spends a lot of time in your pocket, a bag or in your hand, and as a result it will get dirty. Dirt, dust, grease and fingerprints on your lens will have a big effect on the quality of your photos.
- There's no point trying to take great photos if the glass of the lens is dirty. It will block light from entering the camera's sensor and will leave smudges, blurs or dust spots on your images. A clean lens will ensure you get sharp, clear images with your phone.

Cell Phone Photography Tips

- Set the Focus



- The most important thing to look out for when taking a photo is to make sure that your subject is in sharp focus. To set the focus on the camera you simply tap the screen where your subject is in the frame. A small square/shape will appear to confirm the focus point.
- If your subject is moving around, make sure you tap the screen just before you take the shot to ensure that they are in focus.

Cell Phone Photography Tips

- Adjust Exposure Manually



- When you tap on the subject to focus on them, the camera will also use the focus point to set the exposure in the shot. Exposure simply refers to how bright or dark the image is.
- Allowing the camera to set exposure on the focus point isn't always ideal. For example, if the subject is in a dark area of the frame, this could lead to the overall image being over-exposed (too bright) or vice versa.

Cell Phone Photography Tips

- Don't use the Zoom

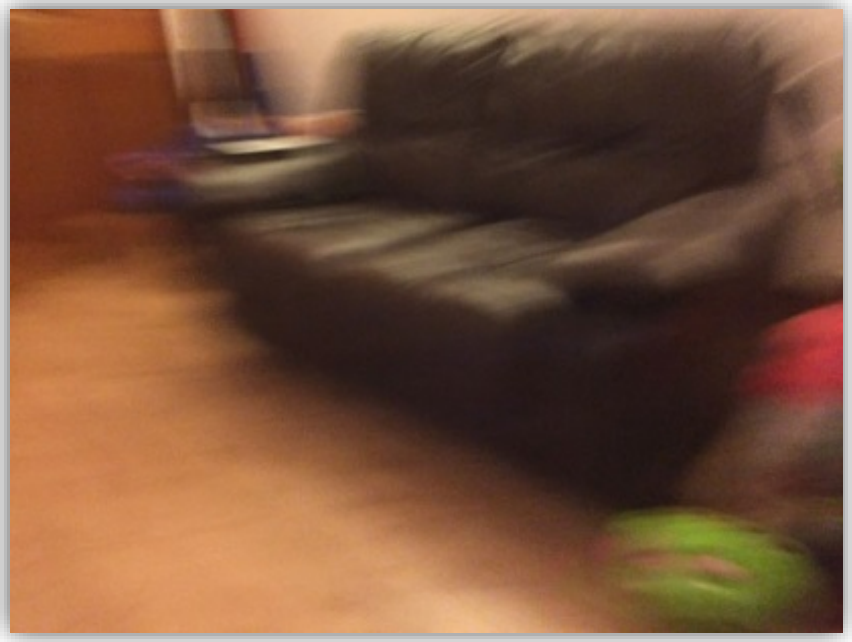


In this example the lighthouse and boats were on the far side of the harbor and looked very small in the original image. The photographer didn't have the choice of walking closer to get a better shot, so it was cropped to make it look like they were closer than they were.

- Most phones have a zoom function which you can access by pinching or stretching two fingers on the screen. This allows you to zoom in and get a closer view of your subject.
- Unfortunately this is a digital zoom and not an optical zoom. In essence what happens with a digital zoom is that the image is cropped as you zoom in. This results in a noticeable loss in image quality the more you zoom in.
- If you want to take a photo of a far away subject, don't use the zoom. Walk closer instead and use the camera as normal without any zoom. You'll end up with a far better quality shot.
- Alternatively you can crop the image yourself in the editing process to bring the viewer closer to your subject. Cropping afterwards gives you more control over how much of the image you want to remove.

Cell Phone Photography Tips

- Hold Steady



iPhone Trick: Connect your headphones to the iPhone and use the volume buttons on the headphones as the shutter release. This means that you can put the phone on a tripod and take a shot without physically touching it, avoiding any chance of camera shake.

- To avoid blurry photos you should hold the phone with both hands or rest it on a solid surface to keep it steady. You could also use a tripod. There are a number of tripods designed specifically for cell phones such as the GorrillaPod by Joby.
- When using a tripod, you can be extra careful by using the timer button on the left-hand side of the camera screen. Place the camera on the tripod and set the timer to 3 seconds.
- When the photo is taken you won't be touching the phone at all which means the camera will be perfectly still when you take the shot. This is taking things to extremes but could be useful in some very low light situations.
-

General Photography Tips

- **One Type of Light**: …at a time. If the tank is lit by multiple types of lights (ie, Metal Halide AND fluorescent) turn off all of the lights but one type. This includes FLASH! Fluorescent lights do not penetrate deep water as well as MH, so you'll end up slightly different colored light from the top of the tank to the bottom. Your eyes probably won't pick it up, but your camera will. Experiment with different types, though. Some creatures will fluoresce under certain lights and give you more vivid photos.





General Photography Tips

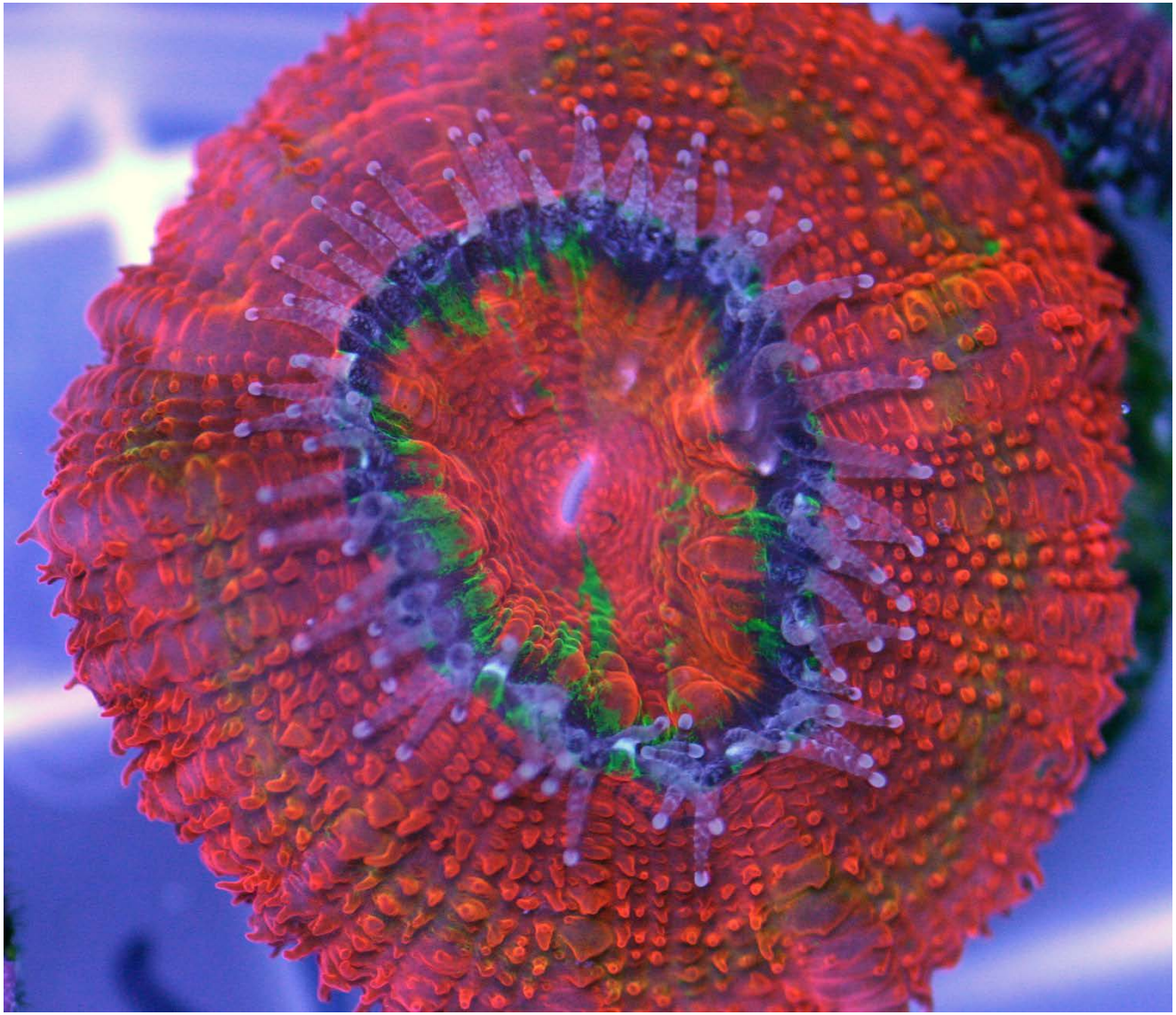
- **Re-Set** : If the lighting setup changes while you're shooting, re-set the white balance. This means that if you change from MH to fluorescent or flash, you must change the white balance (or you'll pay for it later by manually doing it in Photoshop).
- **Right Angles**: Shoot with your lens pointing perpendicular to the plane of the glass to reduce distortion from the glass and water.



General Photography Tips

- **Reduce Water Movement**: Turn off pumps and filters to keep corals from swaying in the current unless you're going to be using strobes.
- **Experiment** with accessories such as macro lenses, viewing boxes (such as the Avast Porthole), and gel filters to create your desired results.





General Photography Tips

- **Use a tripod** or stabilize yourself.
- **Download** a different camera app with better settings/features
- **Do minimal** post processing/editing

