

WORLD'S  
**EASIEST**  
GUIDE  
TO LEARN

**EXPOSURE TRIANGLE**

SHUTTER SPEED

APERTURE

Written by  
**TRABLOGGER**

ISO

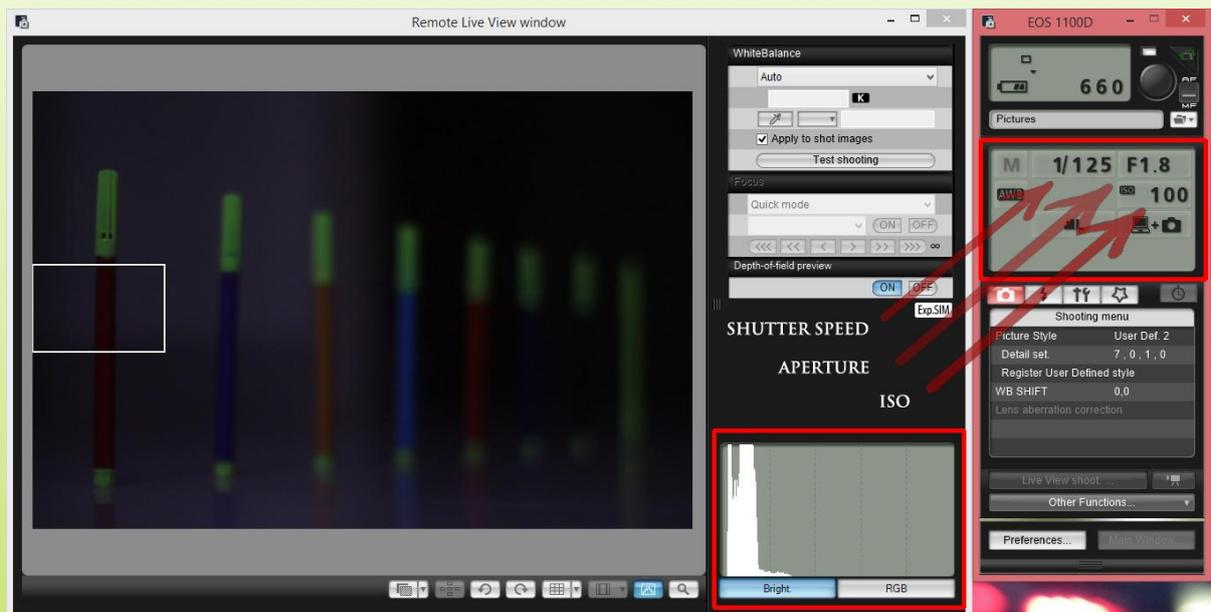
**World's Easiest Guide  
to Understand  
Exposure Triangle**

**Written by  
Trablogger**

In this Guide You will learn about Exposure Triangle, which means the relationship among Aperture, Shutter Speed and ISO.

Let us get started and understand Shutter Speed, Aperture and ISO and their Inter relationship.

Let us start with this picture.



This is going to be the reference Image for all the Control Setting that is going to be discussed further.

You can see three columns in the image. The left big column shows the Image Preview, the second column shows the Histogram and the right column shows the Controls/Settings of the camera.

There are Two boxes in Red Outline. First on the Top Right shows the camera controls. Shutter Speed, Aperture, ISO are Important as of now. So they have been marked in this reference picture. (From Camera to camera, the layout of these settings screen may change.)

The Second box is one in the bottom of Second Column. It shows the Histogram for the current image. It says if the image is Under expose, over exposed or well exposed.

So let us Start with the Histogram.

## HISTOGRAM

Histogram is basically a **Bar Graph** showing exposure of each pixels in the image.

"Zero reading" or "the Left Side" of this Graph is the Darkest point

and the "right most side" is the brightest point.

If the bar graph is concentrated on one side, it is either 'Under Exposed' or 'Over Exposed'.

In the above picture, most of the points in the graph is on the left side which is the dark side. So we can clearly say that the image is under exposed. Likewise if the points in the graph is concentrated on the right side, we can say the image is Over Exposed(We will see the over exposed image in a bit).

If the image is Well exposed, the graph will be evenly distributed over the entire range from left side to right side like an arch. So our main aim, during most of the photographing moment would be to achieve an evenly distributed, arch like histogram, which in turn means to achieve a well exposed image. (But for creative purposes, you can always under expose or over expose your image. There is nothing like a correct exposure.)

But it is not the Histogram that we always check while taking a Photograph. We make use of the built in Lightmeter of the camera. From camera to camera, it may look different, but all of them are doing the same thing- measure the intensity of light.

Here are the few pictures of light meter reading.



Canon on left and Nikon on Right

The small wedge mark below "0" reading shows the optimum exposure. If the mark is towards the "Negative" side it is under exposed. If it is towards the positive side, it is over exposed. Refer your camera manual for more information.

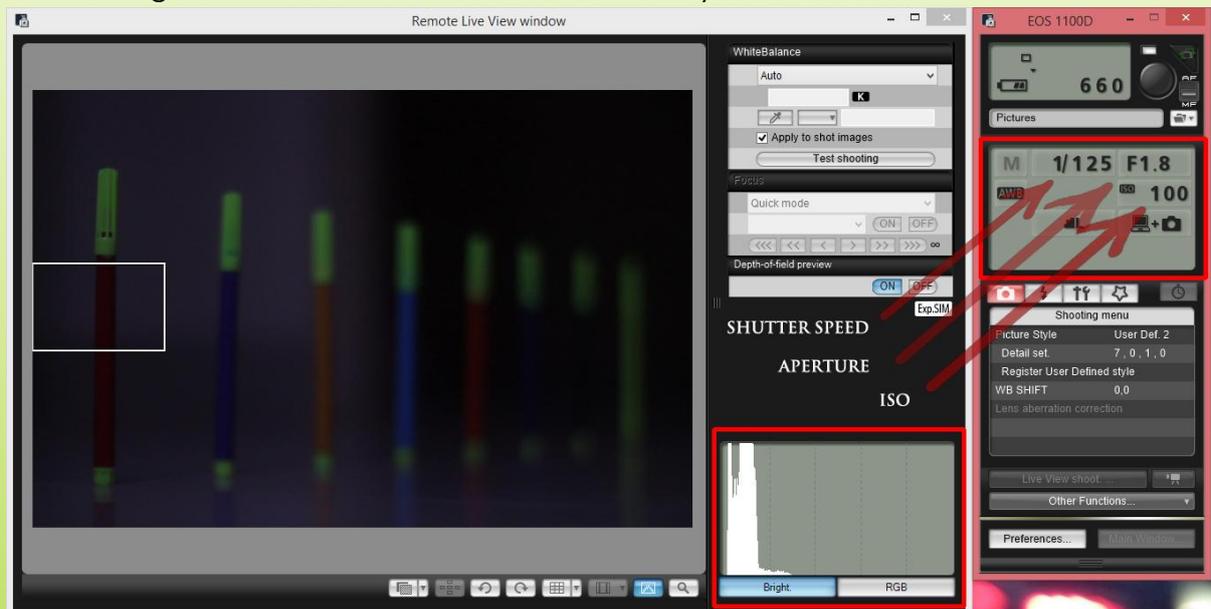
So now let's see the basic terms that we need to know.

## What is Aperture?

Aperture is just a fancy name for a hole through which light enters inside the camera. The bigger the aperture, the more light will enter and vice versa.

Aperture is represented as F1.8, F9, F22 etc or f/1.8, f/9, f/22 etc

The **tricky thing to remember** is as the f number is less, larger is the aperture (or larger is the hole diameter). [ Just remember the number is in **inverse proportion** ] (1.8 means Large Diameter, 22 means small diameter)



So our initial settings as per the image are Shutter Speed 1/125; F number f/1.8; and ISO 100.

Here we have f/1.8, which is a large aperture.

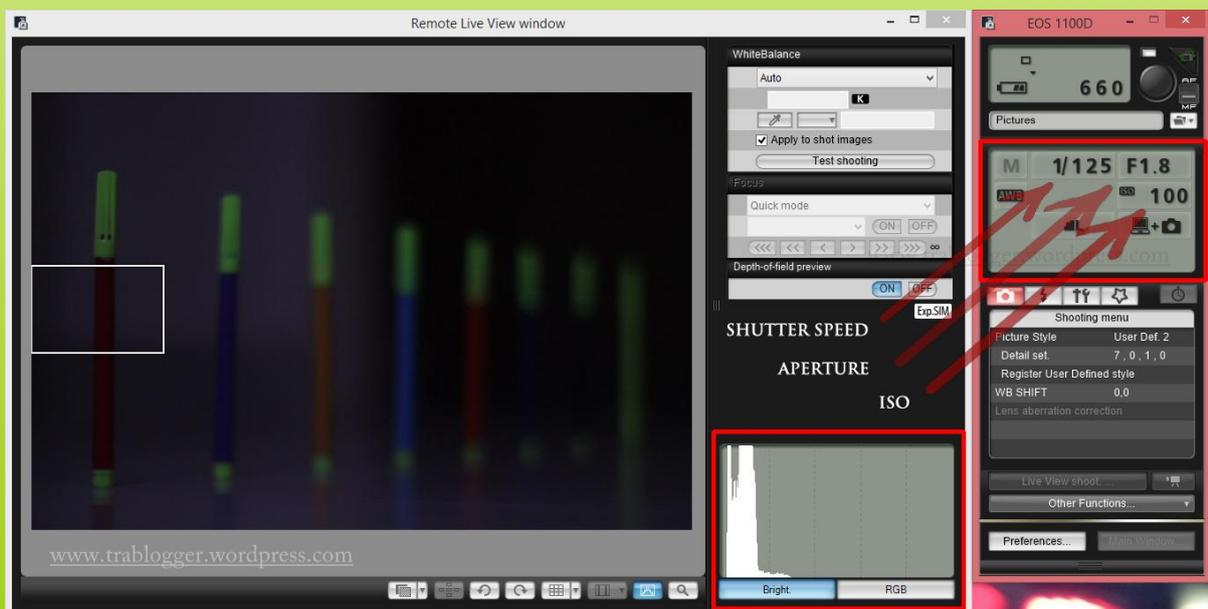
# What is Shutter Speed?

There is a shutter behind the hole to block the light that goes inside the camera. When we press the button, the shutter gets opened for some time allowing the light to go inside the camera. The amount of time in between the opening and closing of the shutter is called as shutter speed. Faster shutter speed means, opening and closing time is fast, which in turn means "less light entered inside the camera". A slower shutter speed allows more light to enter inside the camera as it is a slow process.

Shutter speed is represented as 1/4000, 1/180, 1/60, 1/4, 0.7", 1" etc

1/4000 means if a second is divided into 4000 part, it represents one such part of a second which obviously is a fast shutter speed. A shutter speed of 1/4 means one fourth of a second which is a slower shutter speed.

Slow Shutter Speed is a relative term and the rule of thumb to determine if a shutter speed is slow or not is in connection with the Focal Length. For example, If you are using a 50mm lens, the any shutter speed below 1/50 is considered to be slower one. Like wise if you are shooting at 250mm the anything below 1/250 is a slow shutter speed. For a sharp image, the rule of thumb is to use a shutter speed more than the inverse of the focal length. Remember this is just a rule of thumb only.



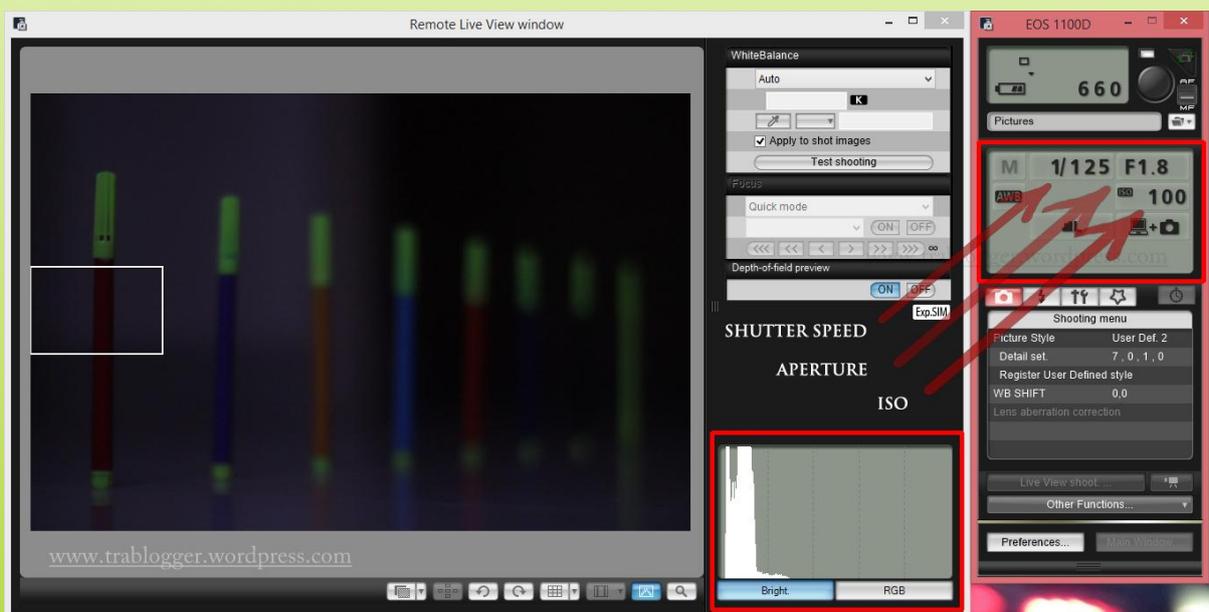
Here in the reference image we have a shutter speed of 1/125 which means 125th of 1 second.

# What is ISO?

The light enters through the lens, passes through the shutter and falls on the camera sensor. This sensor registers the light falling onto it and records the image. The sensitivity of this sensor to the light is called as ISO. At higher ISO, the sensor is highly sensitive to the light. So in low light conditions, to get a better image, we increase the ISO. But a higher ISO also creates grains in the image. So if possible it is better to use a lower ISO.

ISO is represented as ISO 100, 200, 400, 800, 6400 etc.

ISO 100 is lower ISO value. On a good lighting condition we use this value as lower ISO gives the better quality pictures. As the amount of light reduces, we increase the ISO. ISO 6400 is a large ISO value and very sensitive to light. It also gives some grains in the image. ( Grains can be visible once you zoom in and check your images)



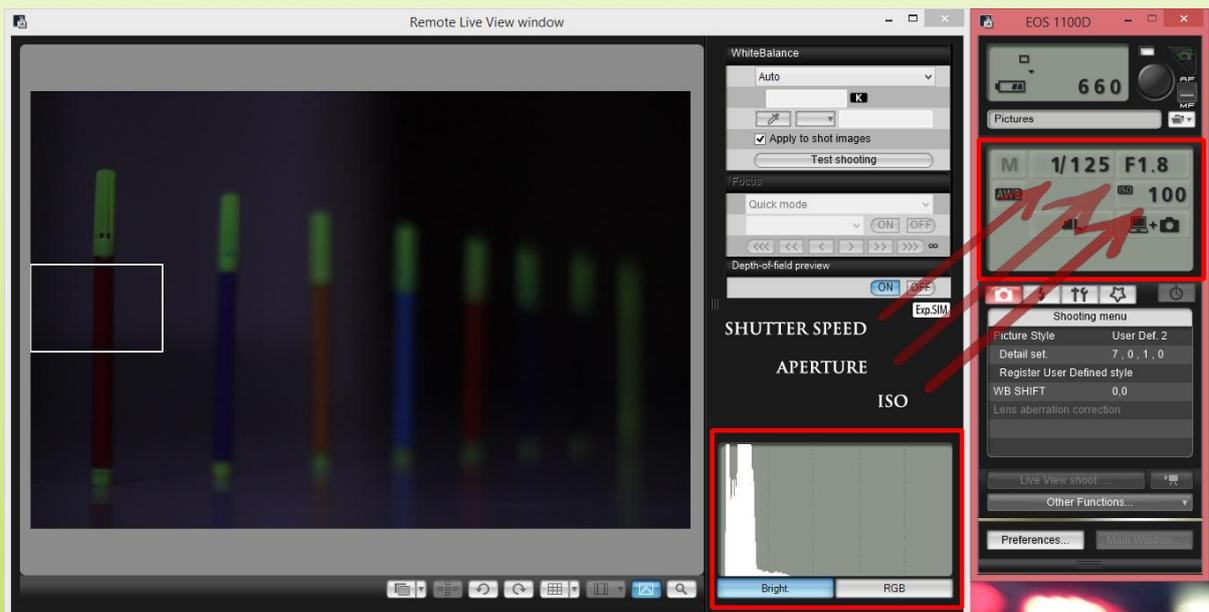
Here in the reference image, ISO is 100.

# Getting Started With Exposure Triangle

As you got a general idea about Aperture, Shutter Speed and ISO, let us go and examine the Exposure triangle or the inter relationship among these three parameters.

## Changing the Shutter Speed Settings

We still need the initial image to get started.



Settings are Shutter Speed 1/125; f/1.8 and ISO 100.

First let us keep the ISO at 100 and Aperture at f/1.8 and change the Shutter Speed alone.

You can see from the Histogram that the image is Under Exposed.

You can check the Camera built in Light Meter.

From the image itself it is obvious that the image looks darker. So it needs more light. As we are not changing Aperture and ISO, our only way to provide more light is to keep the shutter open for more time and let more light to enter. For that we need a slower shutter speed than what we have now.

**Reduce The Shutter Speed To Let More Light to Enter.**

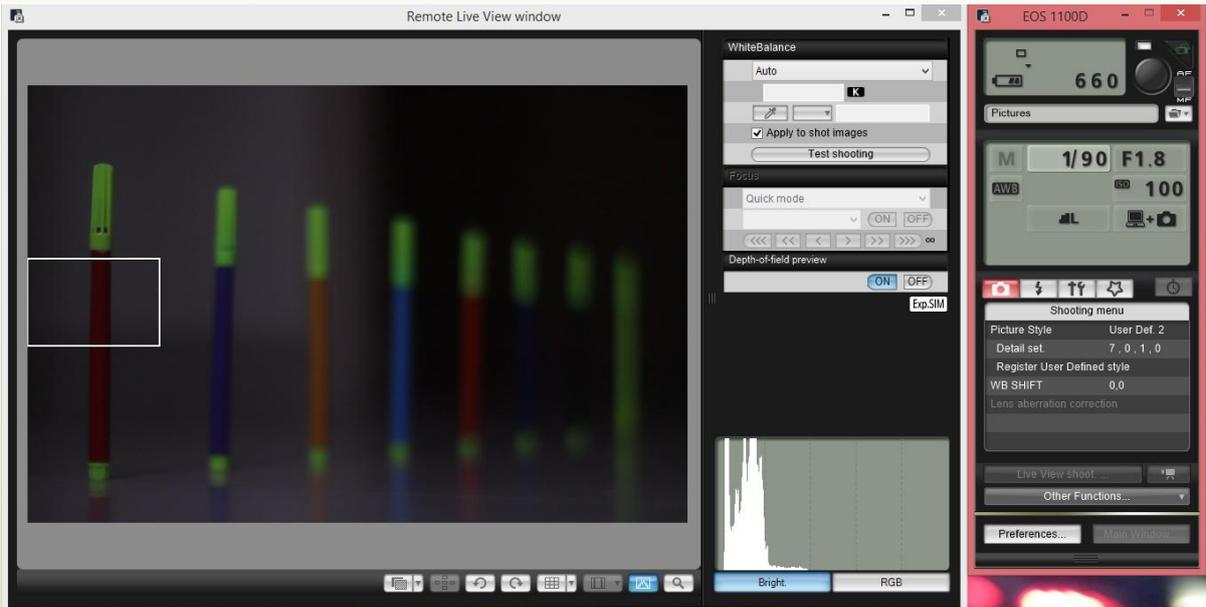
**Slower Shutter Speed = More Light entering**

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**Increase the Shutter Speed To Restrict More Light Coming In**

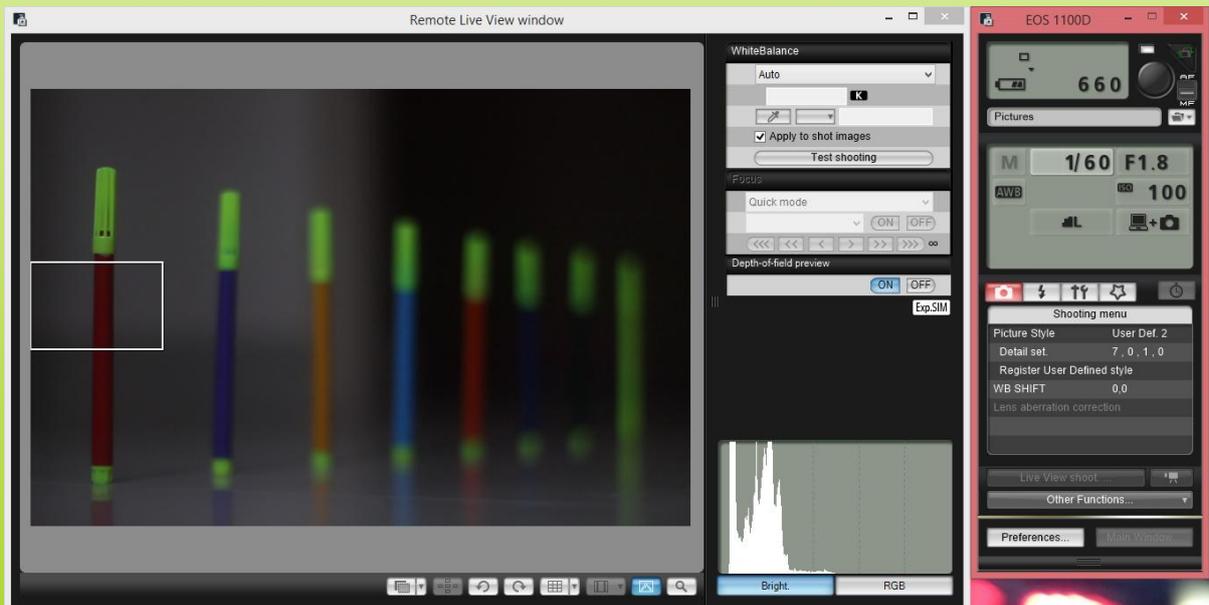
**Faster Shutter Speed = Less Light Entering**

So we will reduce the shutter speed.



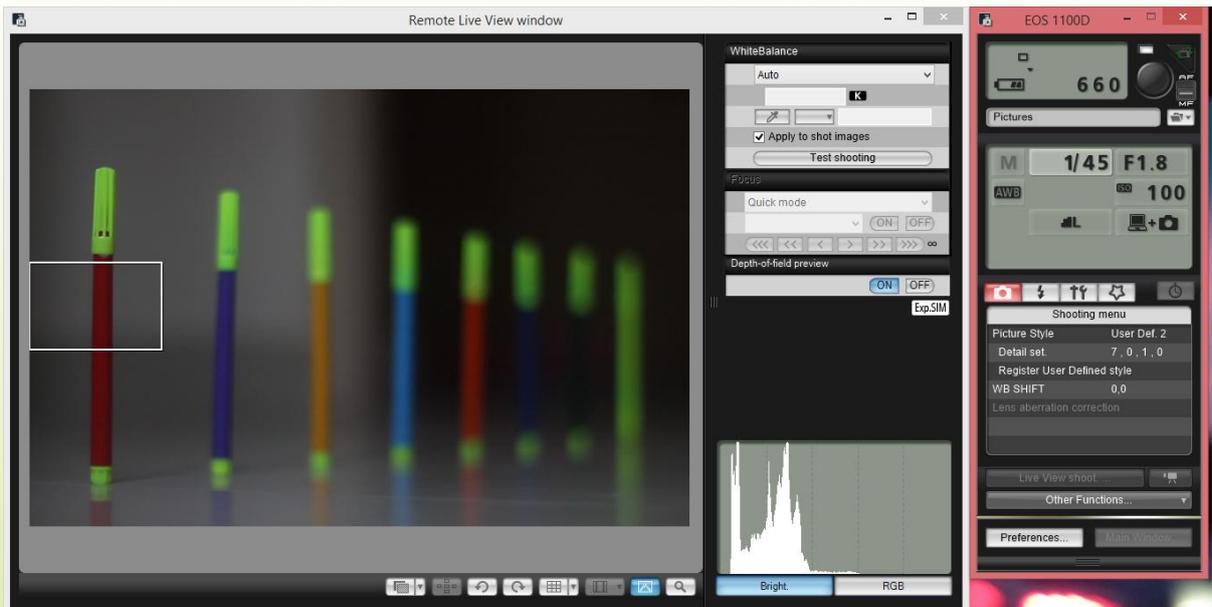
Here settings are Shutter Speed 1/90; f/1.8, ISO 100

We have reduced the shutter speed, but still the image is under exposed. We will reduce the shutter speed further.

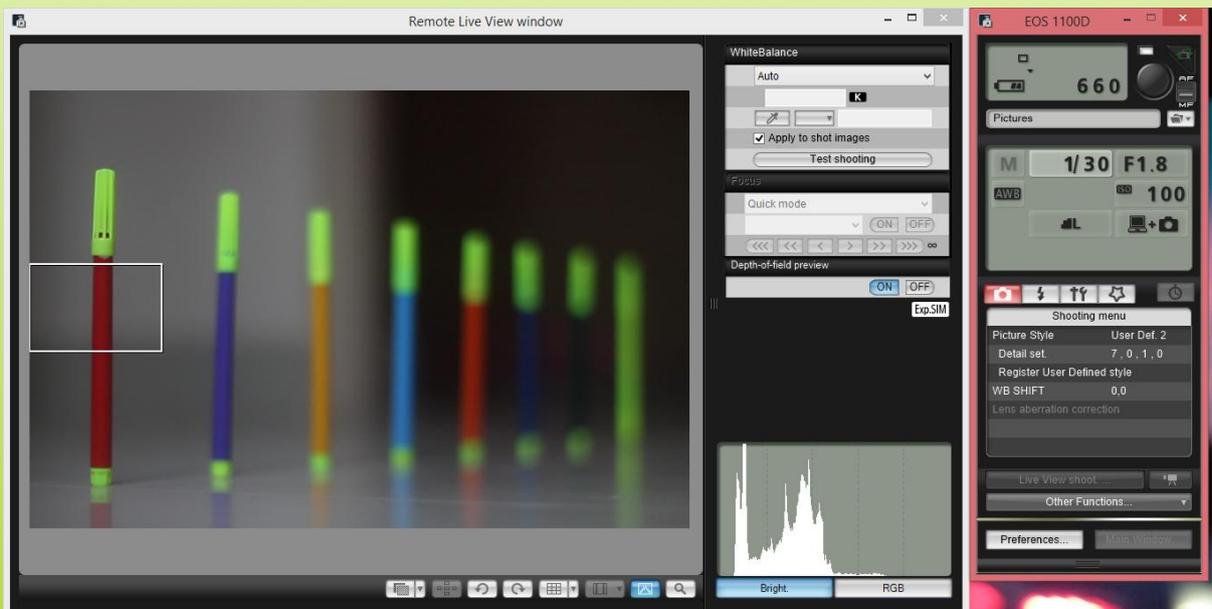


Here settings are ShutterSpeed 1/60; f/1.8, ISO 100

Still Under exposed so we will reduce the shutter speed, till it becomes well exposed. (And remember again, there is nothing like a correct exposure. )



Here settings are Shutter Speed 1/45; f/1.8, ISO 100

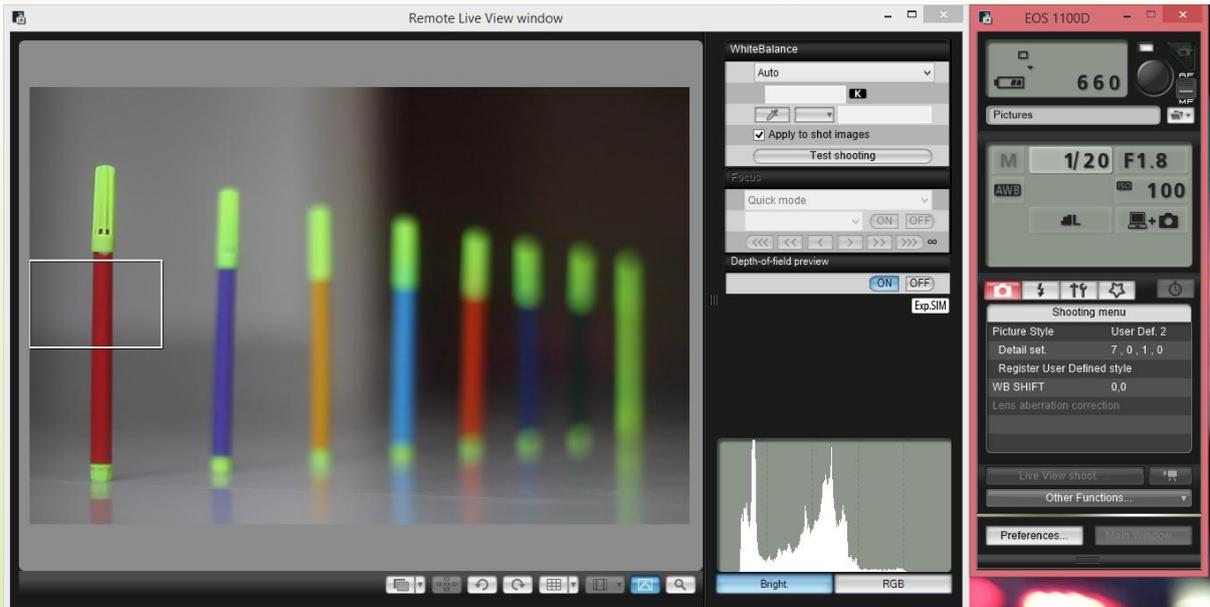


Here settings are Shutter Speed 1/30; f/1.8, ISO 100

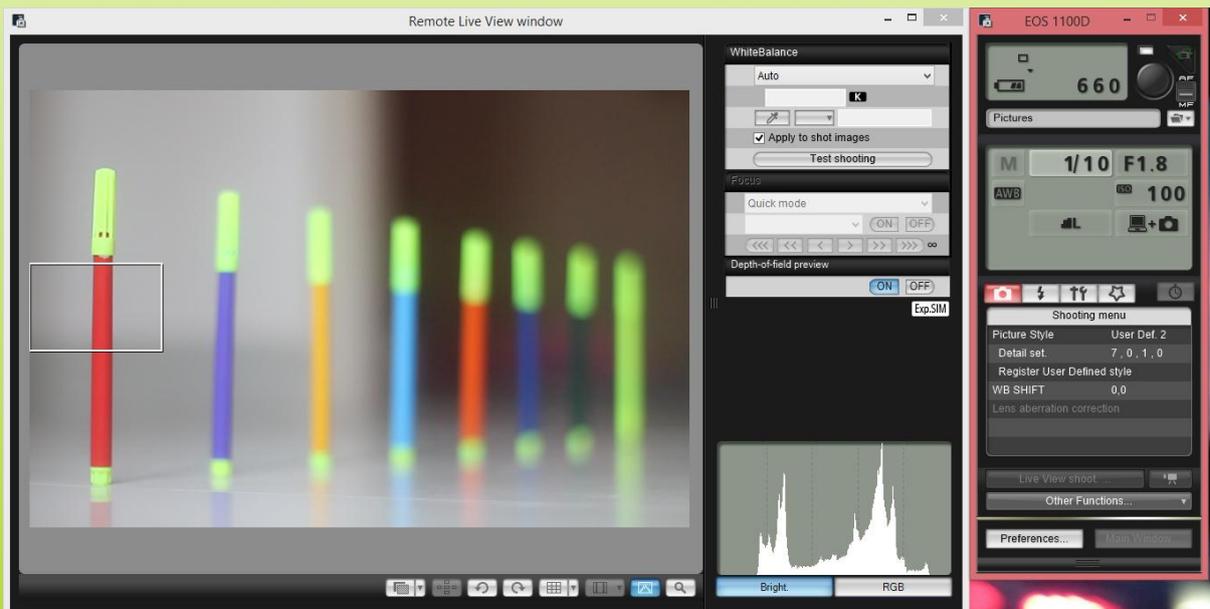
Now you can see, how the histogram is slowly shifting towards right as more light is entering the camera due to a slower shutter speed. And the image is much brighter than the initial image.

So if you feel, this picture looks good and this is the best exposure for you, you can take a picture at this settings. Remember, there is nothing like a correct exposure or correct setting for a particular situation. It is all about what you want from a picture.

Lets further reduce the shutter speed and see what happens.

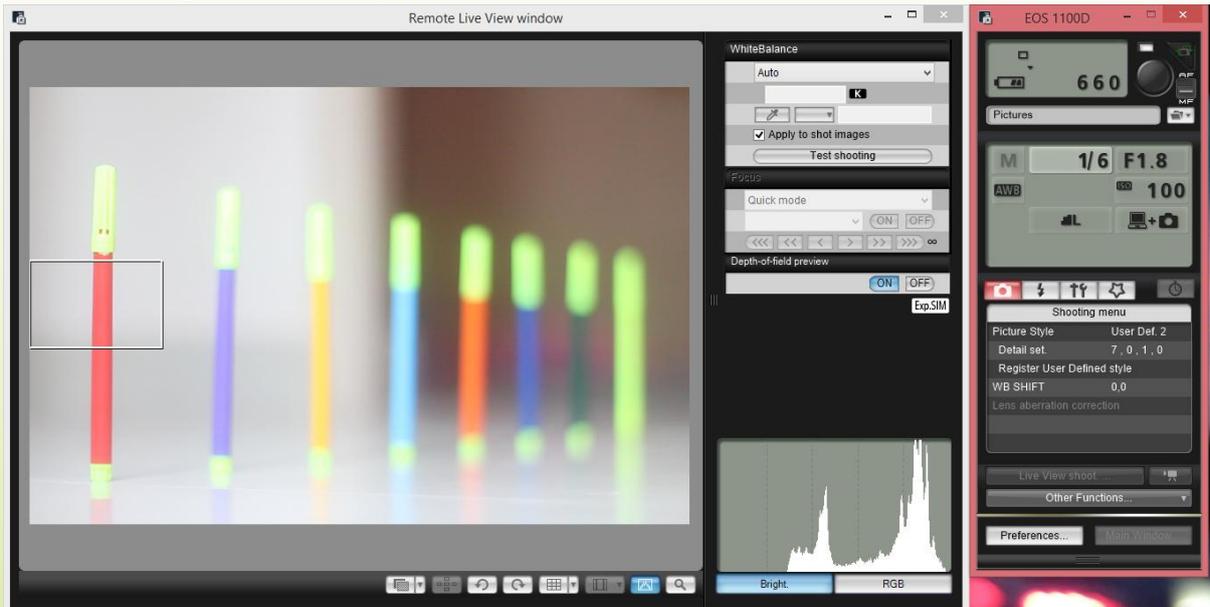


Here settings are Shutter Speed 1/20; f/1.8, ISO 100



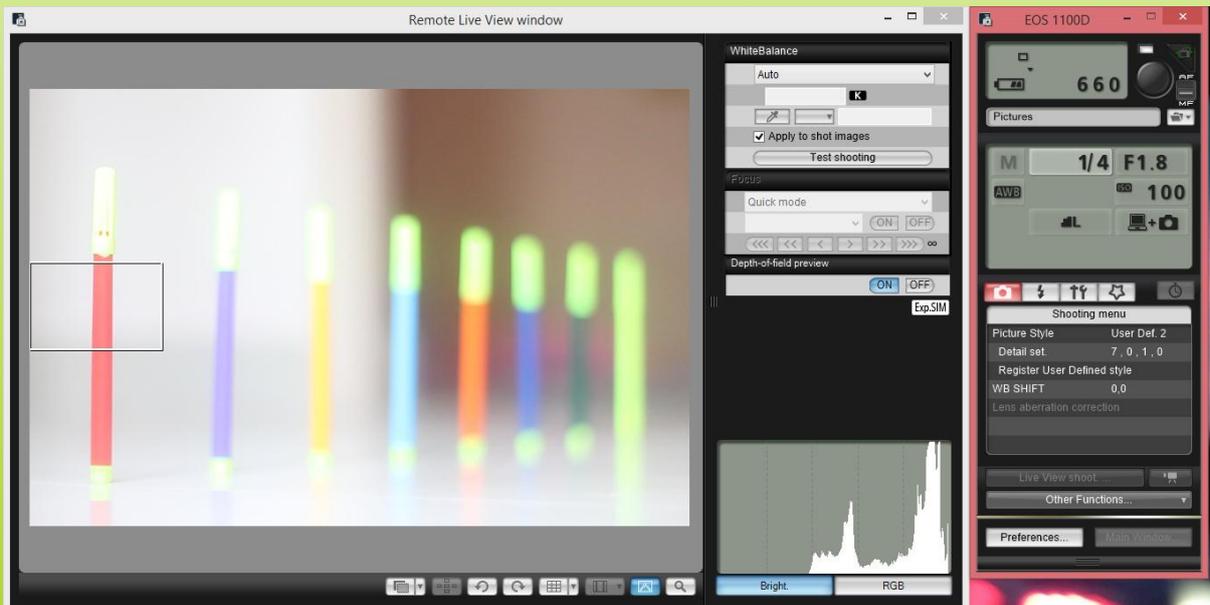
Here settings are Shutter Speed 1/10; f/1.8, ISO 100

And reducing the shutter speed further.



Here settings are Shutter Speed 1/6; f/1.8, ISO 100

Now you can see that the histogram shifted more towards to the right. The image is getting over exposed.



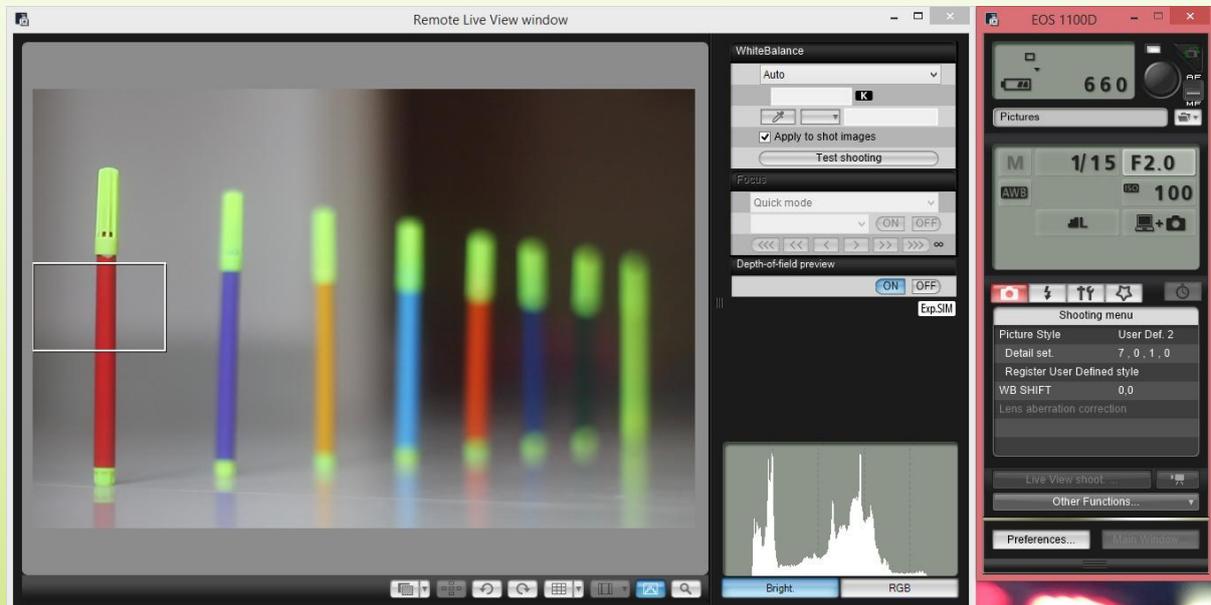
Here settings are Shutter Speed 1/4; f/1.8, ISO 100

Now the image is really over exposed. There is a peak at the right side of the graph.

So far we were only changing the shutter speed. We kept all other settings intact. Now you understand how the shutter speed affects the exposure of an image.

# Changing the Aperture Settings

Lets go back to a **Well exposed image** and try to examine the changes caused by changing Aperture.



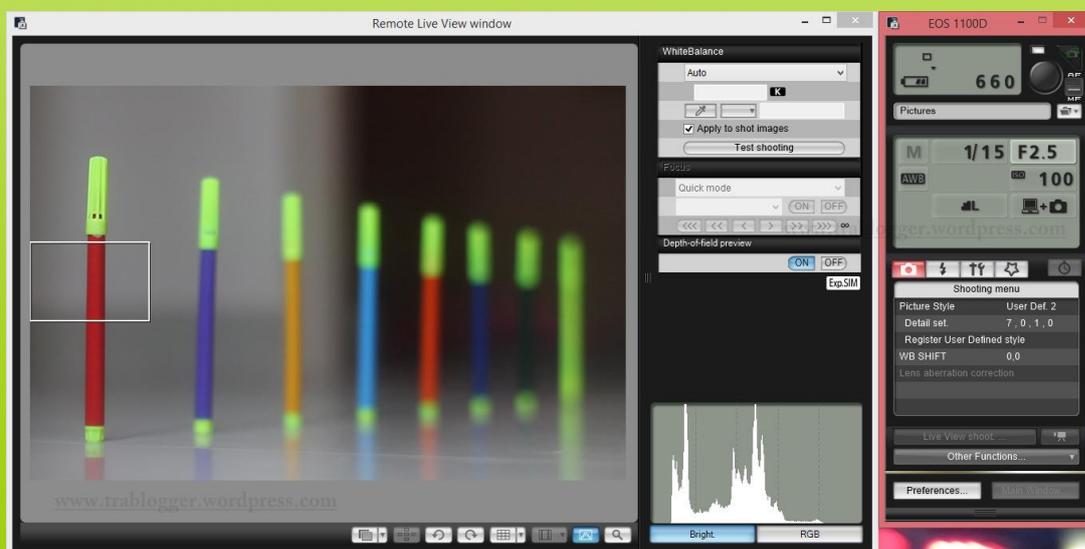
Here settings are Shutter Speed 1/15; f/2, ISO 100.

Here also we are keeping the ISO at 100.

And we are keeping the Shutter speed at 1/15. Now we are going to change Aperture only.

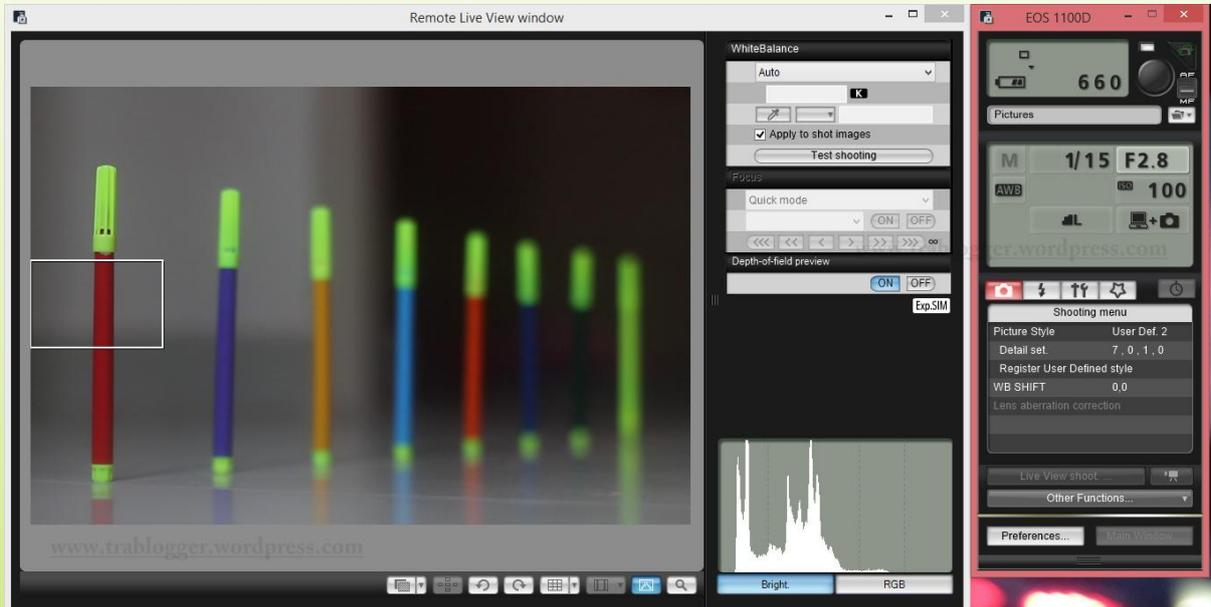
As the current aperture is 2, our only option is to increase the aperture number. (If we reduce it, it can go only upto 1.8 or 1.2 depending upon the lens)

So lets increase the Aperture number.

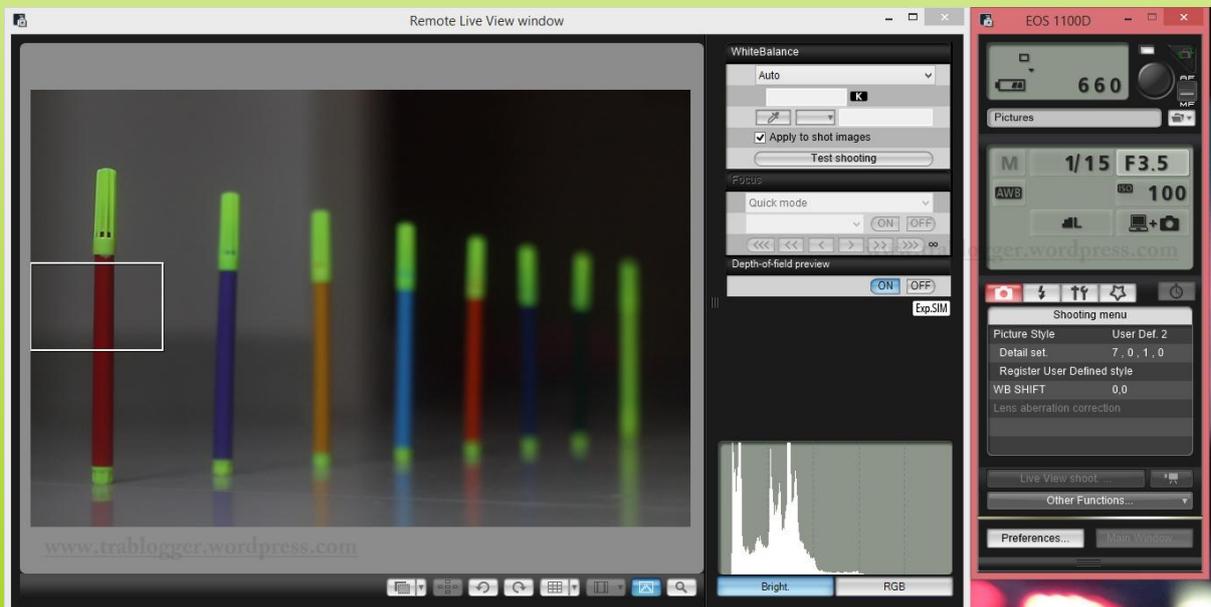


Here settings are Shutter Speed 1/15; f/2.5, ISO 100

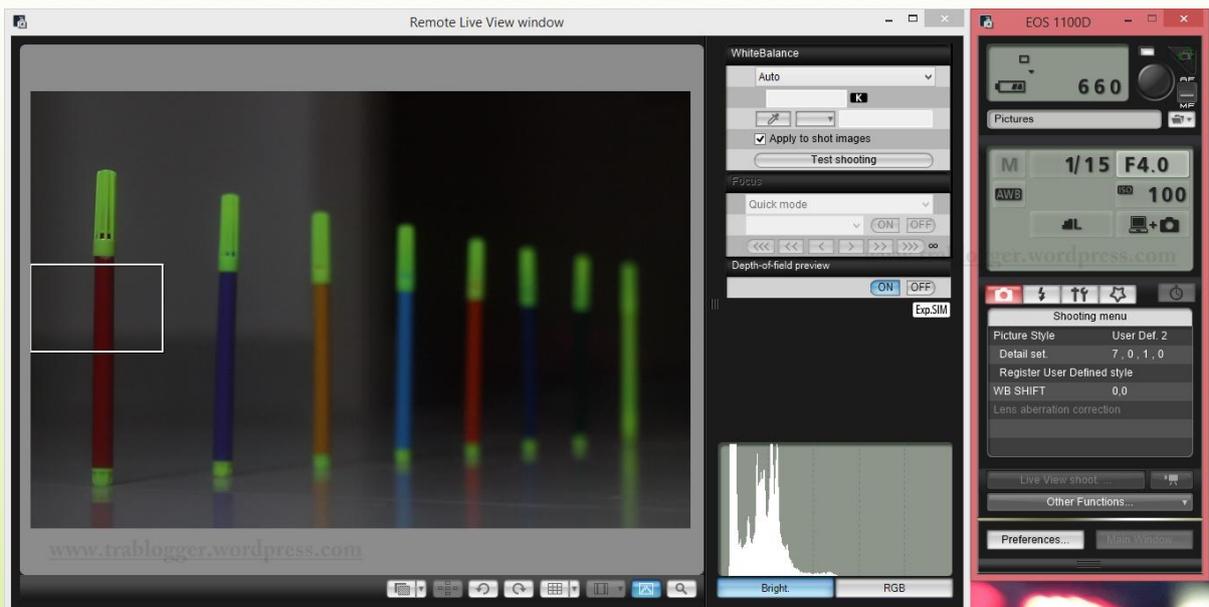
We are increasing the f number. So we are reducing the diameter of the aperture. And thus we are going for a smaller aperture, which means we are reducing the amount of incoming light.



Here settings are Shutter Speed 1/15; f/2.8, ISO 100

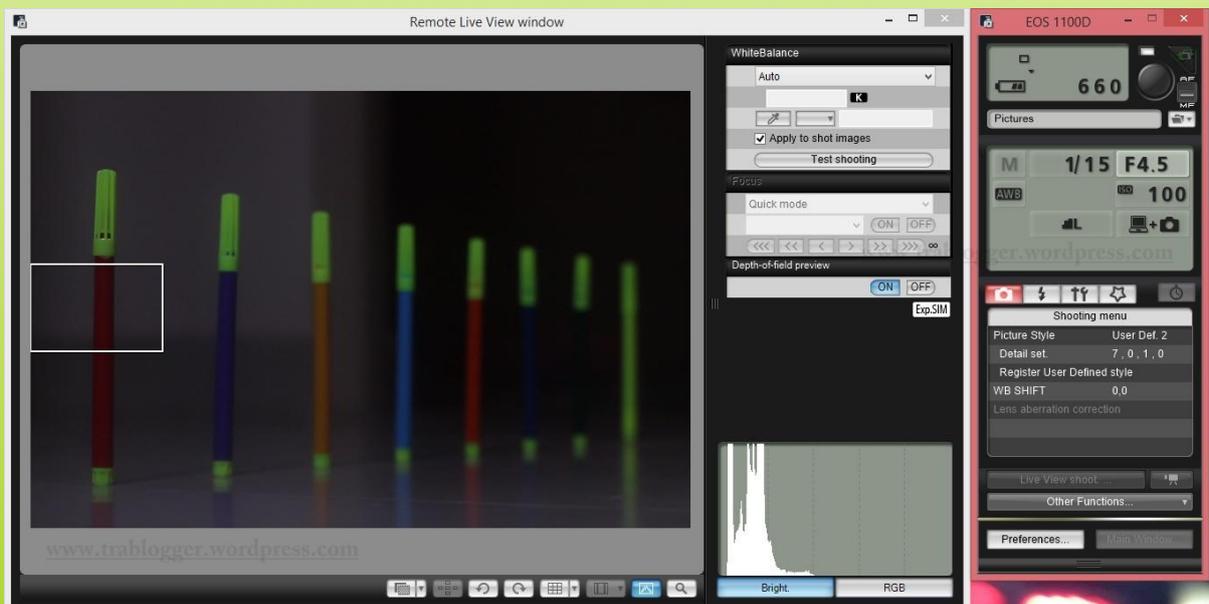


Here settings are Shutter Speed 1/15; f/3.5, ISO 100



Here settings are Shutter Speed 1/15; f/4, ISO 100

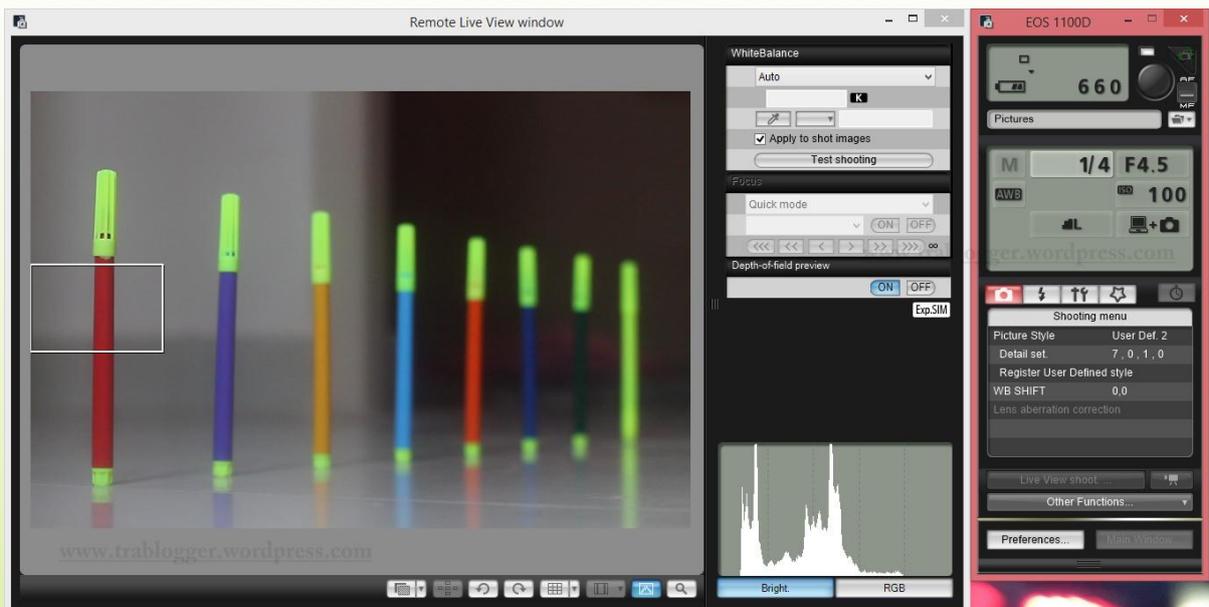
You can see, gradually the histogram shifts towards the darker side as we increase the aperture Number thus by reducing the diameter of the aperture. The smaller aperture is restricting the amount of light entering the camera.



Here settings are Shutter Speed 1/15; f/4.5, ISO 100

As you can see the image is under exposed.

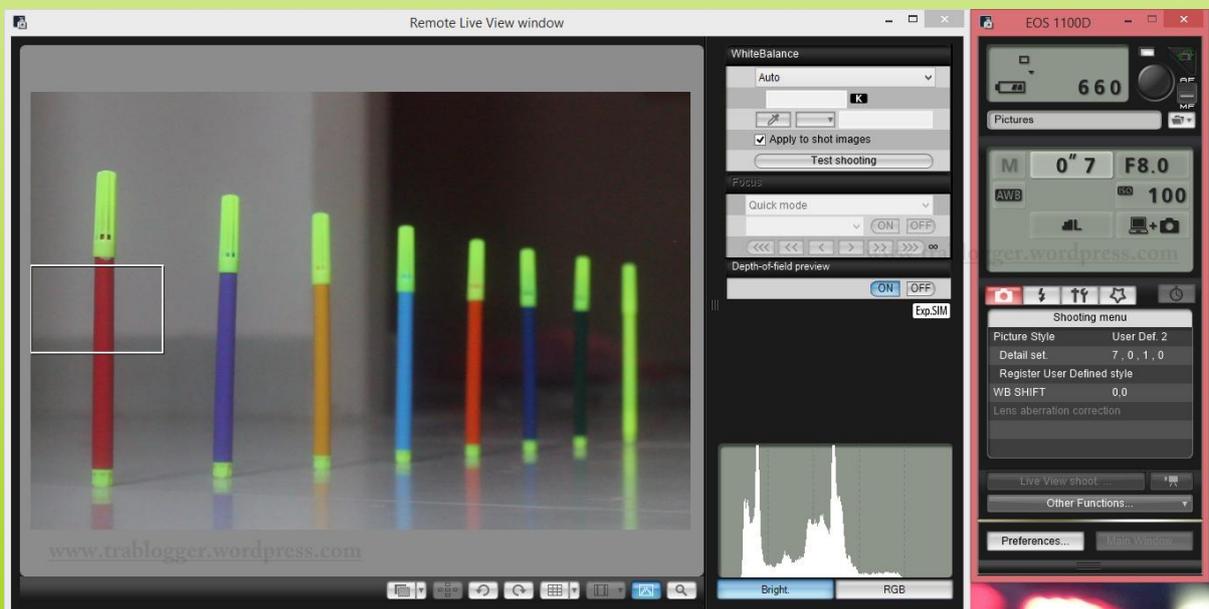
Now the only way to get some more light is to adjust the shutter speed (as we are not changing the ISO yet.) So now lets adjust the shutter speed to make it brighter. So we reduce the shutter speed to introduce more light into the image.



Here the Settings are Shutter Speed 1/4, f/4.5, ISO 100

With this settings, the aperture number is only 4.5; it can go upto 22

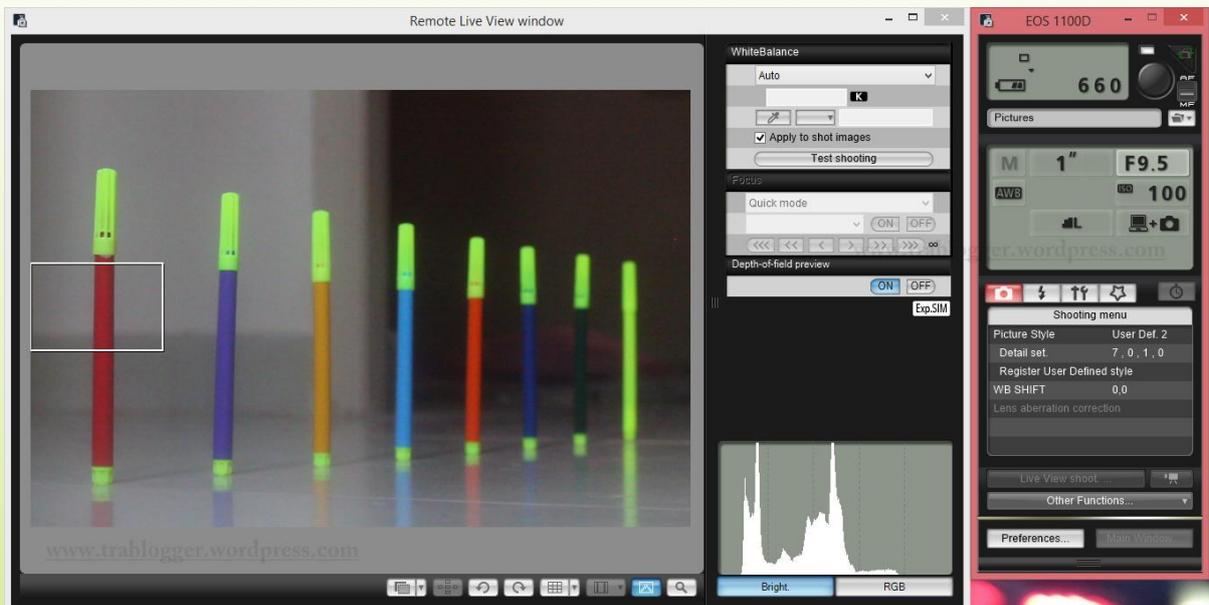
But we want to further increase the aperture number (reduce the aperture). Lets say we want the aperture to be f/8. So in order to get a well exposed image, we need to reduced the shutter speed even further. And we end up getting a setting like this in the below picture.



Here the settings are Shutter Speed 0"7; f/8.0; ISO 100.

Here we have a well exposed image but the Shutter speed is 0"7 which is close to 1"(1 second)

If we want to reduce the hole diameter further, say to f/9.5 we have to further reduce the shutter speed as shown in the below picture.



Here Settings are Shutter Speed 1" (1 second), f/9.5, ISO 100

Again at this settings we have a well exposed image. But it is not possible for anyone to get a sharp image with a slow shutter speed like 1" or 0"7 without a tripod or any other support. Some people even have hard time getting a sharp image at shutter speed 1/4. But we still want to use the smaller aperture like f/9.5 and need to get a sharper Image.

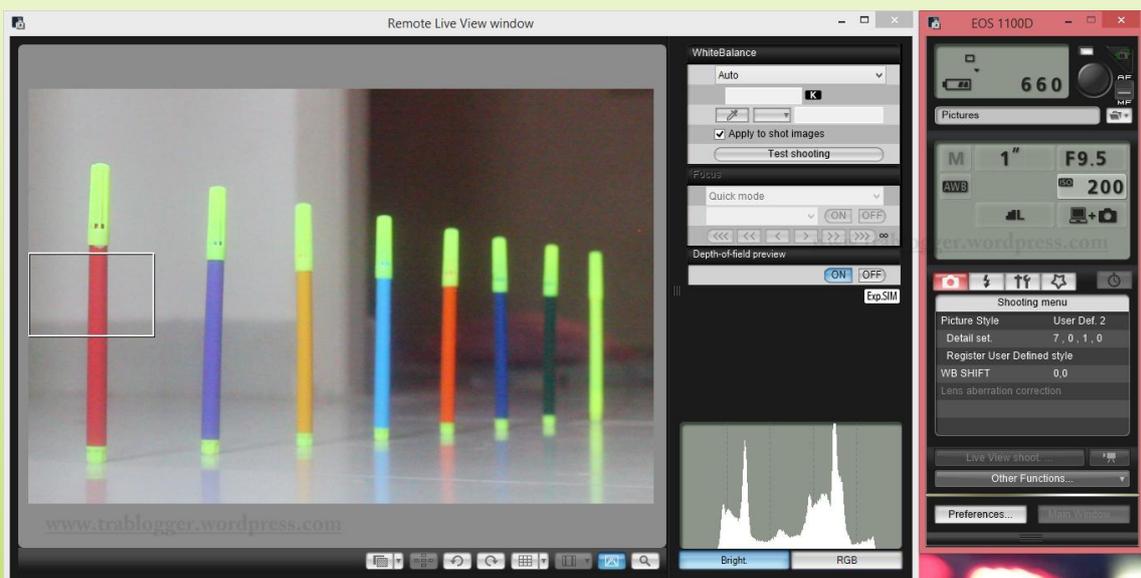
What can we do in such situations?

Ask help from ISO.

# Changing the ISO Settings

At such situations, when you want to use a smaller aperture (bigger aperture number) and the lighting conditions allow only a slower shutter speed, then it is time to change the ISO settings. If we increase the sensitivity of the sensor, we can go for a higher shutter speed even at a smaller aperture.

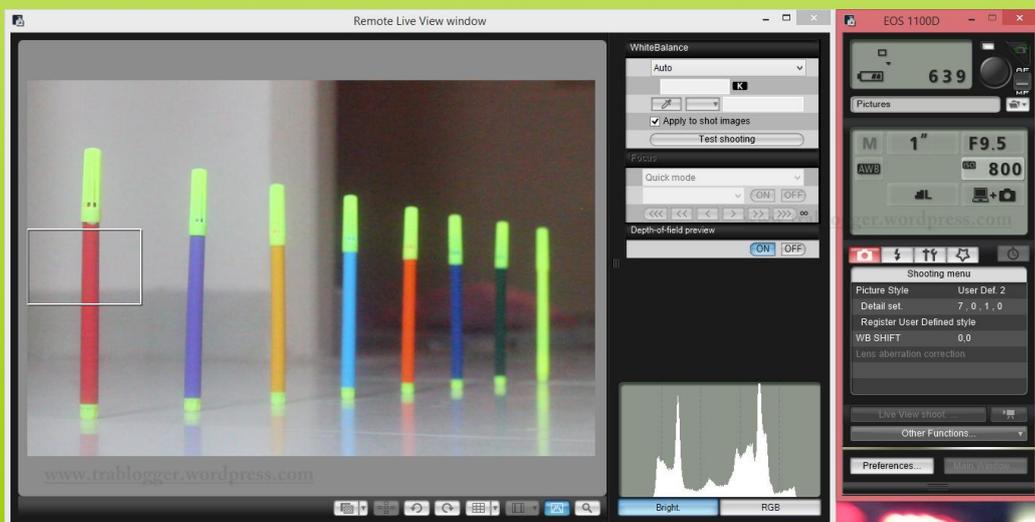
See the image below. It is continuation from the previous picture. Keeping the shutter speed as 1" and Aperture as f/9.5, we are going to change the ISO alone. Check the histogram.



Here Settings are Shutter Speed 1", f/9.5, ISO 200.

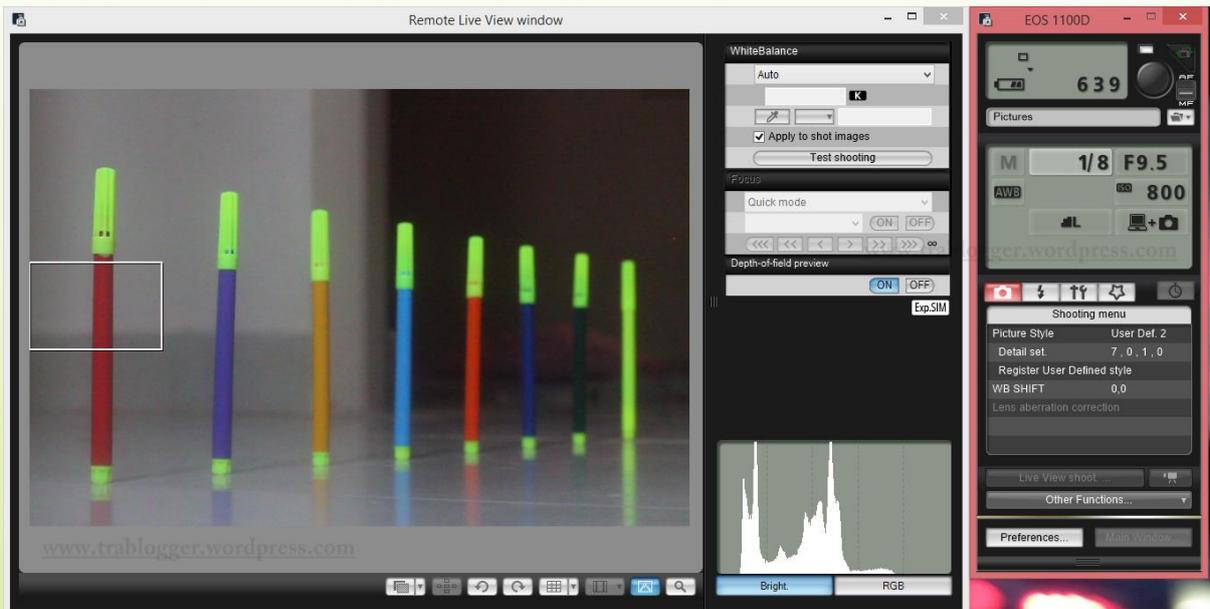
Just by changing the ISO from 100 to 200, the exposure improved considerably.

Now lets keep the ISO at 800 and try to increase the shutter speed.



Here Settings are Shutter Speed 1", f/9.5, ISO 800.

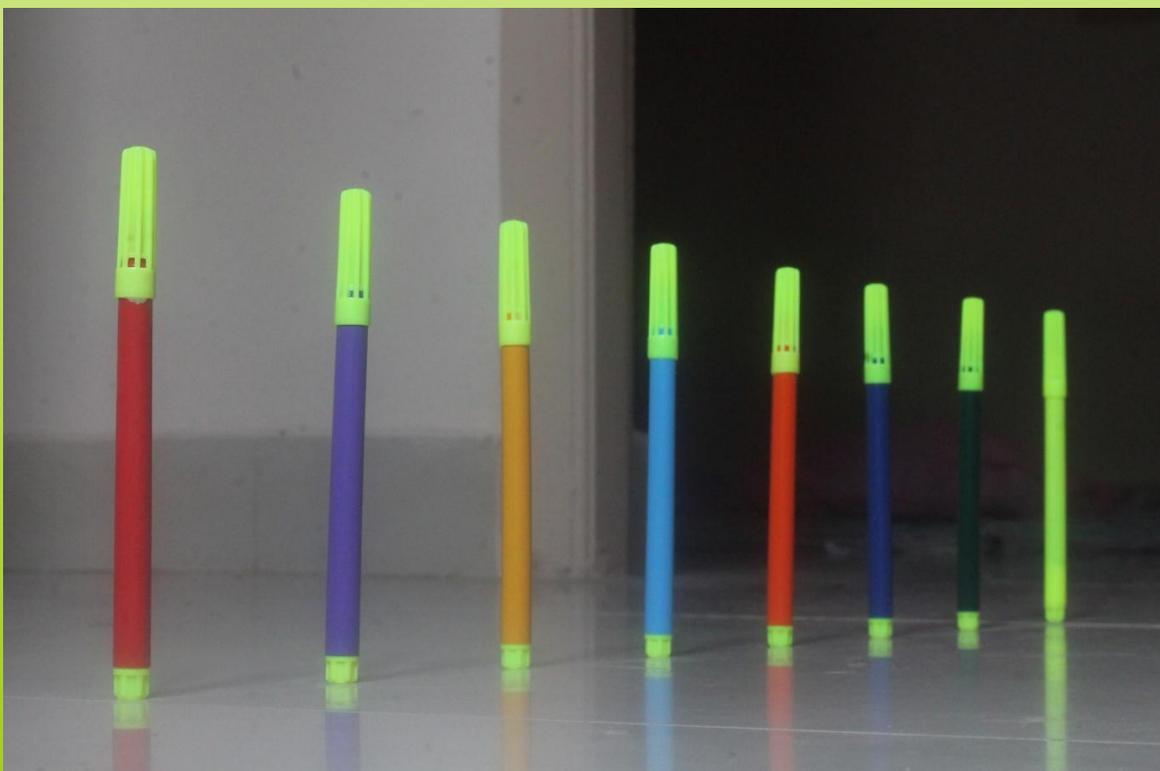
Now let's try to increase the shutter speed to get an optimum exposure.



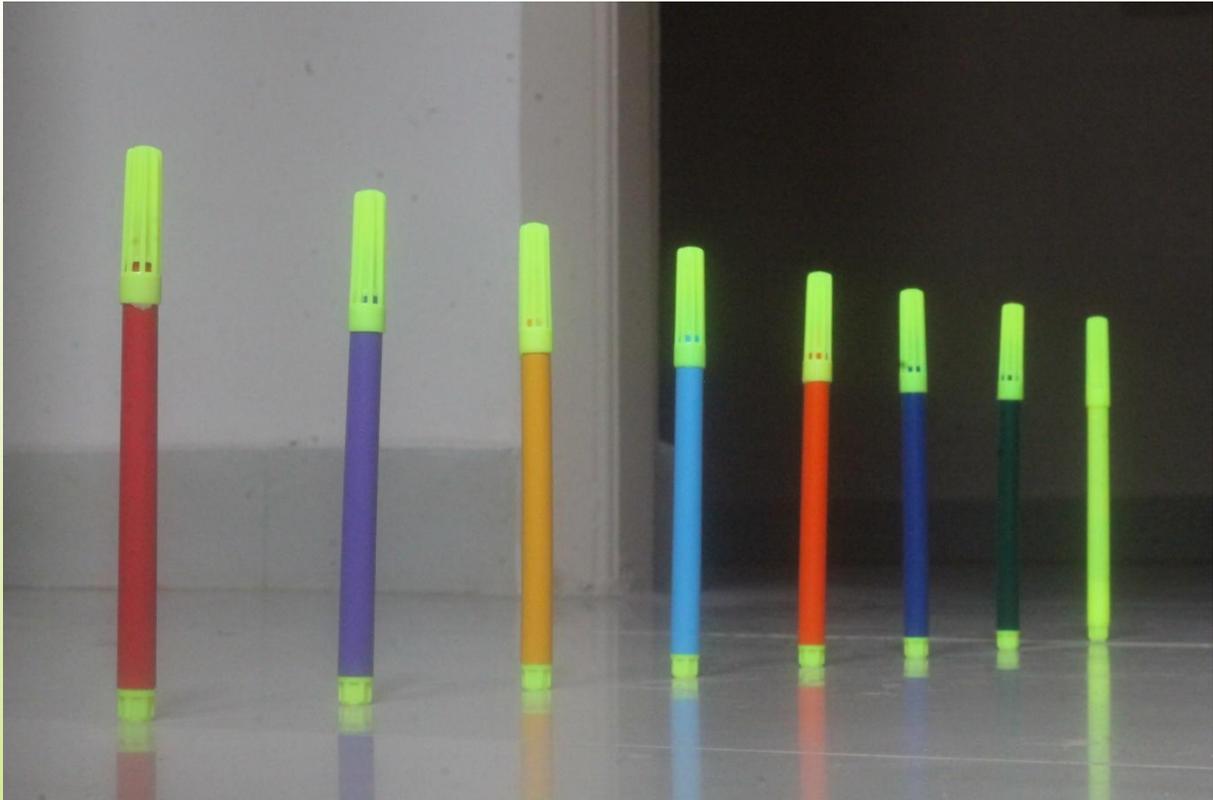
Here the settings are Shutter Speed 1/8, f/9.5, ISO 800

By changing the ISO we could increase the Shutter speed from 1" to 1/8.

If you want to further increase the aperture number and still want to use a faster shutter speed, you will have to increase the ISO further (at the expense of the quality of image, as higher ISO tends to create grainy images)



Here the settings for this picture are Shutter Speed 1/4, f/19, ISO 1600



Here the settings are Shutter Speed 1/4, f/22, ISO 3200

Thus by changing the ISO to a higher value, we can use a smaller aperture (larger aperture number like f/22) at a comparatively faster shutter speed.

So that is why we need to control Shutter speed, Aperture and ISO to get a better exposure.

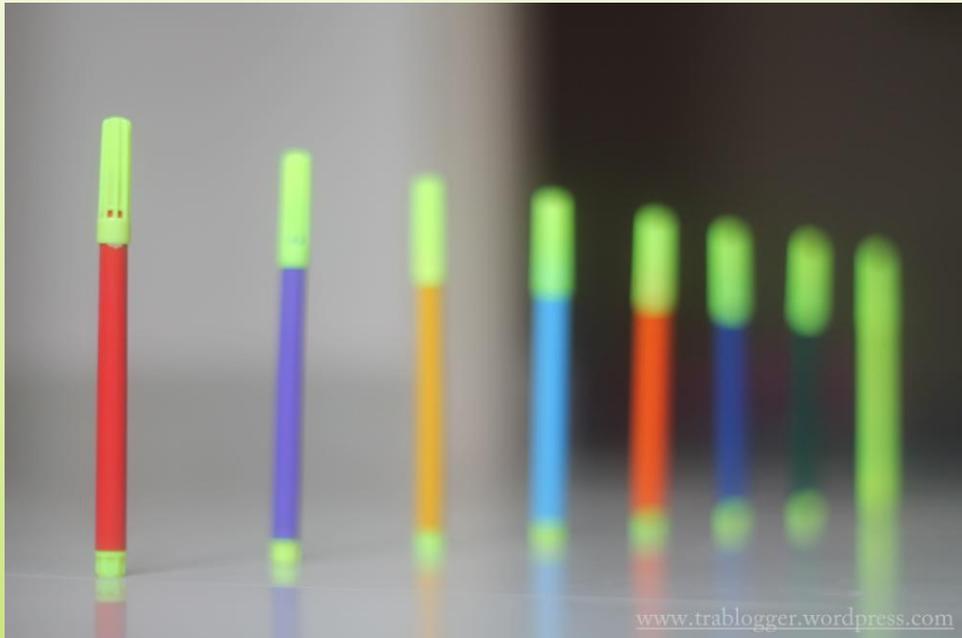
Well now probably some of you might be thinking, why do we want to have a higher or lower aperture? Why can't we just keep a same hole diameter and adjust only the shutter speed and sensitivity of the sensor/film?

By changing the aperture, it offers more controls over the amount of light entering the camera sensor. So we need to adjust the aperture. But more than that there is one important thing, that Aperture controls. **Depth of Field**.

# Depth Of Field (DOF)

Now why do you want to use a Larger or Smaller Aperture?

Aperture value influence the Depth of Field. DOF can make a picture look great. If the subject alone is sharp and all other things and background is blurred, we can say that the image is having a **Shallow Depth of Field**.



Shutter Speed 1/20, f/1.8, ISO 100 Shallow Depth Of Field

If everything, from the foreground till the background in the image is sharp, then we can say that the image is having a **Deep depth of field**.



Shutter Speed 1/4, f/22, ISO 3200 Deep Depth Of Field

So that is one main reason we want to change the Aperture. In a landscape or in a Group Photo we want everything or everyone to be sharp in the image. Not just a single subject. So we need to keep a big aperture number for that.

Similarly if you are wondering Why we need a Slower and Faster Shutter Speed, it is not only to control the amount of light coming into the camera. Shutter speed can be creatively used to depict motion in our still photographs.

A slower shutter speed can Speak volumes about the motion of the subject in a still Photography.



Shutter Speed 1/10; f/8; ISO 100

But a faster shutter speed can freeze the motion of a fast moving train.



Settings are Shutter Speed 1/180; f/4; ISO 100

Now you have quite a good idea about Aperture, Shutter Speed, ISO and their inter relationships. Now you know the basics of the Exposure Triangle and how to experiment with them. Have fun. Experiment. Click More.

For any Queries Mail Me at [info@jimpify.com](mailto:info@jimpify.com)



Thank You..