Macro & Close-Up Photography © 2012

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Macro & Close Up Photography



Macro photography is making small things large.

 Magnification is key, the more we enlarge our subject the more we amplify flaws in our photographic technique.



Introduction (cont.)

Learning and developing close-up skills:

> Does not require a major investment in equipment.

> Will help you improve your general photographic technique.

Opens a whole new world to explore and photograph.



Looked Good When I Took It



Terms to be Familiar With

OnfusionSharpness
Resolut
AcutanceImage CircleResolut
AcutanceAngle of ViewAcutanceFocal Length
ApertureFocusEmmc2DOF presented

Macro

close-up

SharpnessDepth of FieldResolutionCrop FactorAcutanceAcceptable SharpnessviewHyperfocal DistancengthHyperfocal DistanceareFocusFocusFocus StackingDOF previewDiffraction

Foreground and background blur

HIGH TECH YO-YO

Image Capturing Process

- The Camera is designed to mimic the eye
- In both cases the captured data is processed by our brain





Out of Focus Eye vs. Camera

Why don't items that are out of focus appear blurry when I am not using a camera?



Normal Angle of View





Angle of View

- Longer lenses present a narrower angle of view and greater magnification
- A 50mm Lens provides a normal representation *
- Shorter lenses provide less magnification and a greater angle of view













Magnification

 Magnification of a camera lens is based on what the naked eye can see, not what is actually recorded on the image sensor.

• As we move closer to our subject the image, the sensor will increases in size.

• By design, some lenses with macro or close-up capabilities can focus on subjects that



Magnification (cont)

If a lens can not focus on subjects that are very close it is because the lens can not be move far enough from the image sensor.

By adding an extension between the lens and camera we can focus on closer subjects and increase the magnification on the sensor.



Lens Modifiers

For lenses that don't have a Macro mode...

We can move the lens father from the camera body to focus on subjects closer to the camera







Lens Modifiers (cont.)

For lenses that don't have a Macro mode.....

We can enlarge the image before it passes through the lens using

Close-up Filters



Cropped Sensor Misnomer

A 100mm lens on a 1.5 format camera

 Is NOT the equivalent of 150mm lens on a full frame camera

 It does provide the equivalent angle of view to that of a 150mm lens

 It does as the name implies crops or discards image data provided by your





lens.*

* Assumes the use of a full frame lens

Magnification vs. Enlarging

Megapixels	Print Size @300ppi	Print size @200ppi
8	10" x 8"	16" x 12"
10	13 " x 9"	19" x 13"
12	14" x 10"	21" x 14"
16	16" x 11"	25" x 16"
18	17" x 12"	26" x 17"
24	20" x 13"	30" x 20"



When is "In Focus"





Not In Focus



• Only points in the focal plane are in perfect focus on the image sensor

• All light rays from each point will converge at the same point on the image sensor





Focus (2 of 3)

- Red points are those that are beyond our focal point will be blurred and out of focus.
- How much blurring will depend on how far they are from the focal point.



Focus (3 of 3)

- Our brain can't process fine details so some amount of blur is not noticed.
- The amount that the image will be enlarged will determine the amount that can be tolerated.
- The term used for these out of focus points that still appear to be in focus is Circle of Confusion.





Depth of Field

This lens is set to *f*/8. The depth-of field scale indicates that a subject which is anywhere between 3 to just under 1.5 meters in front of the camera will be rendered acceptably sharp. If the aperture were set to *f*/22 *instead, everything from just over* 1 meters almost to infinity would appear to be in focus.

- Many DSLRs are equipped with a DOF Preview
 - Pressing it will help you see what the
 - > captured image will look like.





Acceptable Sharpness Appears to be Sharp

- An image appears to be sharp when out of focus details are so small, or far enough away that brain can not detect them.
- As we enlarge the image or move closer to a printed image we can see more details and imperfections.
- When analyzing an image for sharpness it is best to view the image at a size of 100%.





Foreground & Background Blur

 Once the out of focus points become apparent to our brain we see them as foreground and background blur through the lens.

 Lens characteristics can help us to shift the viewers focus to our intended subject.



Bokeh

Bokeh is a soft effect which can help separate the subject from the background. If you use this you want the background to be simple.





DOF vs. Focal Length





Focus Stacking

- In the same way that we might bracket exposure to capture a higher dynamic range of highlights and shadows we can bracket focus.
- This process produces a composite of stacked images focused at various distances to produce a composite that is a very sharp images

Stacking Software
Photoshop CS
Helicon Focus
CombineZ
Zerene Stacker





Which of these image is sharper?





Which was shot with a greater DOF?

Now Which is Sharper?



Stacking = Focus Bracketing





Measures lens opening

 Closing the aperture (higher f #s) will increase the DOF

 Optimum sharpness will vary from lens to lens, but is usually 2-3 stops from wide open

Image sharpness will also degrade when shot
with a minimum aperture (diffraction)











Images are sharp where we see a distinct transition from one shade or color to another. Therefore, we can only detect sharpness where there is a transition or relatively high contrast.









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Sharpness & the illusion of sharpness

The two key concepts are:

- > image resolution (lenses & camera)
 - Include physical properties of the lens, image sensor and capture technique
- > image definition (image processing)
 - Include post processing use of clarity, image sharpening techniques and enlargement for the intended viewing



Lens Resolving Power

High Quality Enlarged

Low Quality Enlarged

- Higher quality lenses capture finer detail
- The detail of a quality lens will be more apparent under higher magnification





Image Sharpening

• Current software sharpening will not totally restore image



Putting it all Together

Sharp images are more about good technique

 Magnification of images, both during capture and print/projection, push the limits of our image capturing and processing skills





How Does All This Technical Stuff Help?

• Why did we expose you to all of the theory?

• When we enlarge macro shots what happens?

 Every flaw gets exaggerated therefore more attention needs to be had on some photos. Understanding the theory helps.



What do I need for Macro Photography

- ✓ Tripod must have
- ✓ Macro Lens or
- Lens with Macro feature built in or
- ✓ Close Up Filter or
- A good point and shoot camera or
- All of the above



Size Does Matter

- Considerations for macro lenses are how close you will get to your subject.
- Shorter is usually better unless you are photographing insects e.g. bees, butterflies and the like.
- The longer the macro lens the farther you can stand and not "spook" the little guys.



Other aids working with macro



- Shutter Release devices
- Extension Tubes
- ✓ Bellows
- ✓ Special Macro Flash
- Light Box
- Stacking Software

Focus on the far end of the apple

Set the focus point to the part of the apple to give a sharp image at the back side of the apple

Trying to get a sharp and close image is next to impossible with one photo



Our second apple photo

Here, we are focusing on the left side of the apple





The third photo

The Focus point is the close side

Note focus here too





Fourth photograph

The concentration for focus here is the middle of the stem_____







Focus point on the fifth image is the tip of the stem



and the second



The Apple is good enough to eat





What can I use to practice my macro photography ?

✓ Fruit ✓ Coins ✓ Stamps ✓ M&M's ✓ Screws ✓ Flowers Toys Bugs

or other food items or close up paper money or other collectables or other small candies or other small nails etc. or leaves