Close-up Photography (Macro)

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Macro and Close-up Photography

- What is Close-up versus Macro Photography?
- Discussion on what represents a Macro Image!!!!
- What are the main techniques?
- What equipment is needed?
- Videos over tea break
- Demonstration on
  - Focal Length and Magnification
  - Practical focus stacking
  - Processing

What is Close-up Photography

- Close up photography is the act of photographing small objects such as flowers or insects so that the subject you are photographing fills the frame.

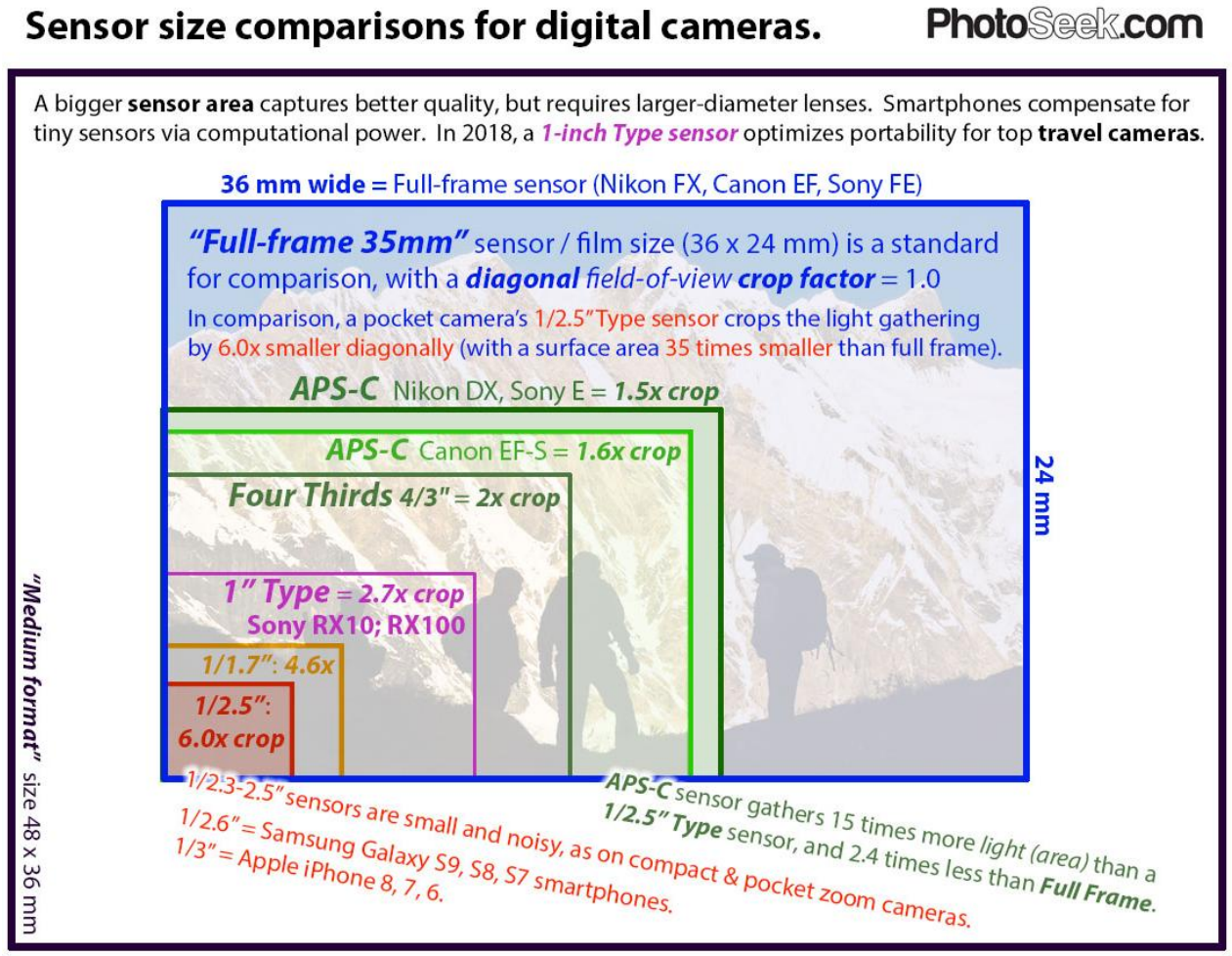
What is Macro Photography

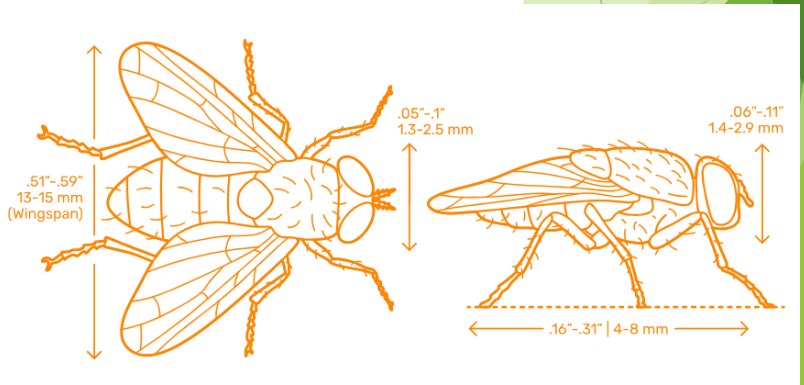
- It is photographing small subjects to make them look big.
- Common definition, a macro photograph is one in which the size of the image captured is life-size or larger on the sensor of the camera (i.e., optical reproduction ratio ≥ 1:1).
  - i.e. if a fly is 10mm, when it is recorded it should be at least 10mm in size on the sensor.

- Why does this cause us a problem ??

The definition for Macro is not definitive

- 1. The term optical reproduction ratio ≥ 1:1 does not consider sensor size. Therefore, the representative of the same subject may look different on different camera types





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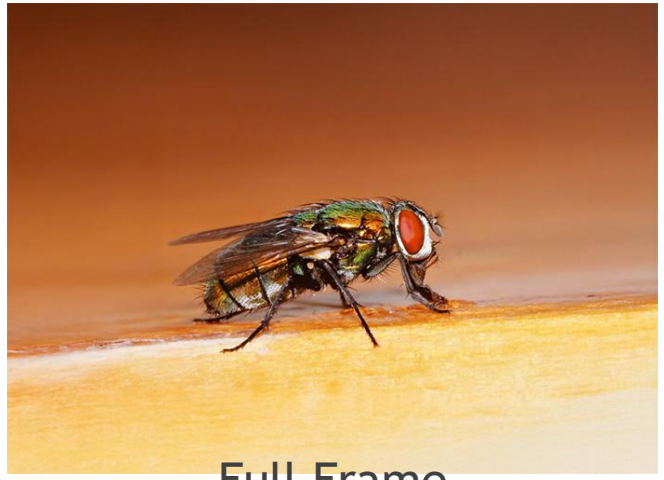
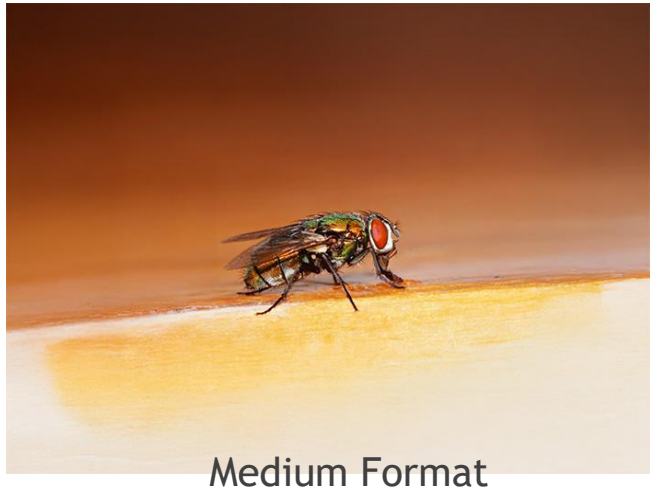
Four Thirds

APS C/DX



Full Frame



Medium Format

Apple Camera

Which of these would you consider as a Macro Shot?

- The term optical reproduction ratio ≥ 1:1 also does not consider the presentational crop.

Different ways to take a Macro image

- Single shot
  - Advantages
    - Simple to setup and take
    - Good for subjects that move
  - Disadvantages
    - Needs good light
    - Very shallow depth of field
    - May require one or more of the following:
      - high shutter speed
      - High ISO
      - Additional lighting
- Photo Stacking
  - Advantages
    - Increased depth of field via multiple different shots
    - Higher quality
  - Disadvantages
    - More difficult to take
      - Increased technical issues
      - Slower to take and live subjects prone to move
    - Requires increased processing (although some cameras do this for you)

Ways to Photo Stack

- Variable focus points
  - In this technique you keep the camera and the subject fixed.
  - Vary the focus and take series of shots.
  - Ensure that there is at least one photo that is in focus for each part of the subject.

- Fixed Focus
  - In this technique you keep the focus fixed.
  - Vary the distance between the lens and the subject.
  - Ensure that there is at least one photo that is in focus for each part of the subject.

Focus Stacking
Fixed Focus

- Table top
  - Uses dedicated hardware – macro lens, extension tubes, focus rails, etc.
    - focus on the nearest point
    - Move the lens forward or the subject closer while continue to shoot, until subject totally covered
- In the field
  - While this maybe hit and miss but it should provide a better image that a single shot.
    - Focus manually,
    - set camera to continuous shooting/ burst mode,
    - focus on the nearest point required,
    - Move forward while continue to shoot, (increase chances of covering every thing by rocking back and forward)
    - Review and get luckily. (tricky and you will never really know how successful you have been until the images are processed.

Focus Stacking
Variable variable focus

- Requires a subject unlikely to move that quickly
- Keep the distance between the camera and the subject fixed
- Set a focus point and take a shot
- Move the focus and take a further shot
- Repeat until you have all the subject is covered
- Manual Focus then zoom in on the screen to check focus, this should should give the best results
- Check the images to ensure everything is covered before moving on

Focus Stacking
In-camera variable focus

- Increasingly, this facility is available on newer camera models
- Each model of camera will have a slightly different method to engage this mode
- Requires a setup where you have access to auto focus mode, not savialable with manual lens.
  - If time allows set up a tripod and work methodically.
  - If will be handheld and you will have to rely on luck that everything is in focus!
- Focus on the closest point you what sharp and then start the series.
- The camera will automatically step the focus forward between each shot
- The camera will stop after the programed number of shots or if the focus has reached infinity

Equipment

- Camera
  - Any SLR or Digital camera should provide a satisfactory image
  - New phones can provide some very acceptable macro functionality
- Lens
  - Telephoto Lens - Demo
  - Dedicated Macro lens - Demo
  - Reversing Rings - Demo
  - Extension Tubes - Demo
  - Close-up Filters - Demo
- Lighting
  - Natural lighting or with enhanced with reflector(s)
  - Constant lighting (LED panels, torches etc.)
  - Flash – on and off camera (speedlights/strobes) with disfuser, macro rings and frames
- Camera Mounting
  - Tripod
  - Macro rails and bellows

Lens - Adapters

- The purpose of adapters is to allow you to focus closer to the subject, hence increasing the magnification.
  - Simplistically this is achieved by moving the lens further from the sensor
- Reversing rings – allows the lens to be mounted in reverse to the camera
- Extension tubes - Normally come in sets of two or three, they can be used individually or stacked. They are mounted between the camera and the lens.
  - Manual – no electronic connection, gives no control over the lens (no autofocus or aperture control)
  - System specific – All electronics passed between the camera and the lens (Focusing and aperture control)
- Macro Close-up Filters – like a standard filter, screws or clips onto the front of the lens and magnifies the image.
- Macro Rails – allows the lens to be moved in relation the camera - similar to Extension tubes only variable.

Processing

- Manually - only for the masochism – load as layers and mask out areas not in focus and blend.
- Photoshop – three stage process – Load all images as separate layers, Auto align them, Finally auto blend the layers.
- ON1 Photo RAW 2025
- **Luminar Neo**
- Dedicated software
  - Premium – Helicon Focus, Zerene Stacker
  - Free – CombineZP, or MJKZZ stages

Equipment

- Macro Lens
  - These are specially designed to give a closer minimum focus distance hence greater magnification
  - They can range from 1:1 to 5:1
  - Automatic or manual
  - Come in various shapes and sizes

Equipment

- Extension Tubes
  - Camera system specific
  - Fully automatic – all lens contacts available
  - Manual – no electronic contacts

Equipment

- Reversing Rings
  - Camera straight to reversed lens
  - Lens to Lens (may require step-up or step-down rings)

Equipment

- Macro Filters
  - Magnifying filters which attach in front of the lens
  - Cheaper versions are marketed as Close-up filters and can serve a purpose but quality will very low
  - Raynox filter is more expensive and gives better quality

Equipment

- Lighting Continuous
  - Reflector – translucent to soften – white to reflect
  - LED Panel – Torch – Phone light
  - Specialist Micro lights

Equipment

- Outdoor Flash
  - Speedlights - best used with
    - off-camera trigger
    - with a modifier to soften the light
  - Ring Lights

Macro rails and bellows

- The purpose of a macro rail is to provide very fine movement of the camera or subject.
- Manual – simple screw slider, come in either 2-way or 4-way movement, typically 1.25mm per one revolution. More expensive rails gives finer movement.
- Automated - Adjustable in moving steps from: 0,025 or 0,05 mm